MARCIO FALEIROS VENDRAMINI

# VARIANTES NO GENE DA ADIPONECTINA (ADIPOQ): RELAÇÕES COM ADIPONECTINEMIA E DIABETES MELLITUS TIPO 2 EM NIPO-BRASILEIROS

Tese apresentada à Universidade Federal de São Paulo – Escola Paulista de Medicina para obtenção do Título de Doutor em Ciências.

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# SUMÁRIO

# *INTRODUÇÃO*

O conceito clássico do tecido adiposo como um reservatório inerte de gordura mudou nos últimos quinze anos para um órgão endócrino ativo com funções regulatórias no metabolismo corporal, assim como na resposta imune e inflamatória. Essas ações são mediadas por peptídeos secretados pelo tecido adiposo que apresentam características em comum com as citoquinas, sendo coletivamente referidos como adipoquinas ou adipocitoquinas, e compreendem, entre outros, a leptina, fator de necrose tumoral α (TNF-α) e adiponectina.

A adiponectina, identificada há aproximadamente dez anos atrás por quatro grupos independentes usando diferentes abordagens, é o peptídeo mais abundante secretado pelo tecido adiposo. Em 1995, Scherer e col., descreveram uma proteína de 30 kDa produzida exclusivamente no tecido adiposo que foi denominada ACRP30 (*adipocyte complement related protein of 30kDa*) devido a sua semelhança estrutural com a fração C1q do complemento[1]. Essa proteína foi também identificada como o produto do DNAc isolado independentemente como adipoQ[2] e APM1 (*AdiPose Most abundant Gene transcript 1*)[3]. No plasma humano, a proteína foi isolada como GBP28 (*gelatin binding protein 28*)[4]. Após a caracterização de sua organização genômica e localização no braço longo do cromossomo 3, a proteína foi denominada adiponectina[5]. Vários nomes foram dados a essa proteína, porém sua importância era desconhecida. Com o desenvolvimento de um método de ELISA (*enzyme-like immunoabsorbent assay*) para mensuração de seus níveis plasmáticos, revelou-se o significado clínico da adiponectina.

## ESTRUTURA E MODO DE AÇÃO

O gene da adiponectina, atualmente denominado ADIPOQ de acordo com a nomenclatura da *Human Genome Organisation* (HUGO), localiza-se no cromossomo 3q27 e é composto por três *exons*. Nessa região identificou-se um *locus* de susceptibilidade para o Diabetes Mellitus tipo 2 em caucasianos e japoneses e também para traços quantitativos associados com a síndrome metabólica[6-8]. A adiponectina é uma proteína de 30 kDa e 244 aminoácidos em sua estrutura monomérica, sendo constituída por quatro domínios ou regiões: uma região amino-terminal de seqüência sinalizadora; uma região variável entre as espécies, que não apresenta homologia com outras proteínas; uma região colagenosa, que sofre glicosilação e hidroxilação; e uma seqüência carboxi-terminal, que forma o domínio globular altamente conservado entre as espécies e que apresenta homologia com o TNF-α [9](Figura 1).

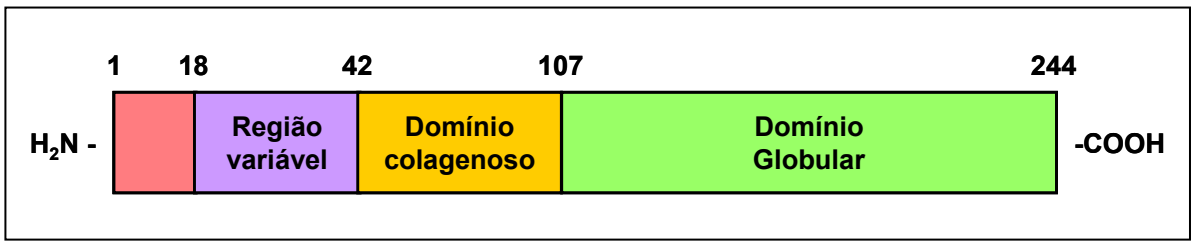


**Figura 1:** Estrutura primária da adiponectina humana.

Através de modificações pós-tradução de glicosilação e hidroxilação, a adiponectina apresenta-se em três principais formas oligoméricas: trímero de baixo peso molecular, hexâmero de peso molecular médio e multímero de alto peso molecular, contendo doze ou mais monômeros. Três monômeros se associam pela região globular para formar trímeros e esses, por sua vez,

multimerizam para formar hexâmeros e complexos de alto peso molecular[10] (Figura 2). Aparentemente, essas interações envolvendo as regiões globular e colagenosa são importantes para a estabilidade e atividade das formas multiméricas. O resíduo cisteína na posição 36 (região variável amino-terminal) está envolvido na formação das pontes dissulfeto que são essenciais para a formação dos complexos oligoméricos; também a hidroxilação dos resíduos prolina e lisina nas regiões variável e colagenosa tem papel importante na ação insulino-sensibilizadora da adiponectina[11]. A forma monomérica da adiponectina não é encontrada na circulação e parece estar confinada aos adipócitos. As isoformas presentes na circulação são estáveis e, aparentemente, não sofrem interconversão *in vivo*[12]. Estudos *in vitro* e *in vivo* indicam que a maior parte, se não a totalidade, da atividade biológica da adiponectina é atribuída aos complexos de alto peso molecular. Dados de estudos em seres humanos mostram que as concentrações dos multímeros de alto peso molecular refletem melhor as anormalidades metabólicas da obesidade e estão mais associadas ao desenvolvimento da síndrome metabólica do que as concentrações de adiponectina total[13-15].

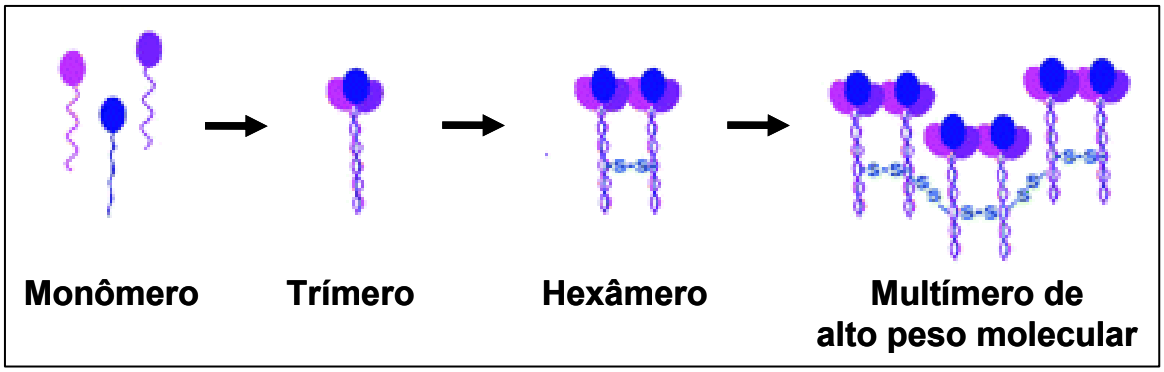


**Figura 2:** Formas multiméricas da adiponectina

Vários métodos têm sido utilizados para análise da distribuição das isoformas de adiponectina. Scherer e col. utilizaram técnicas de centrifugação em gradiente e *Western Blot* quantitativo para mensuração das diferentes formas de adiponectina *in vivo* e *in vitro*[1,13]. Tsao e col., empregaram cromatrografia de filtração em gel para isolar os complexos de adiponectina[16,17], enquanto Waki e col., desenvolveram um método mais simples, baseado em eletroforese em gel de poliacrilamida sob condições não redutoras e não denaturantes[18]. Recentemente, Nakano e col., desenvolveram um ELISA utilizando anticorpo monoclonal contra adiponectina humana de alto peso molecular[19].

A adiponectina circula na corrente sangüínea em altas concentrações (3 a 30 µg/ml) em adultos saudáveis, correspondendo a aproximadamente 0,01% do total de proteína plasmática. Há um dimorfismo sexual nos seus níveis circulantes, com as mulheres apresentando valores mais elevados do que os homens[20,21]. Há ainda um dimorfismo sexual em relação aos complexos oligoméricos, com os homens apresentando uma menor proporção de multímeros de alto peso molecular em comparação com as mulheres[22].

Os efeitos pleiotrópicos da adiponectina são mediados por dois receptores de superfície clonados por Yamauchi e col., em 2003 e denominados AdipoR1 e AdipoR2. O AdipoR1 é expresso abundantemente na musculatura esquelética, enquanto que o AdipoR2 se expressa predominantemente no fígado. Ambos os receptores contêm sete domínios transmembrana, porém são estrutural e funcionalmente distintos dos receptores acoplados à proteína G. O AdipoR1 parece ter alta afinidade pela porção globular da adiponectina e baixa afinidade

para a proteína integral, enquanto que o AdipoR2 tem afinidade intermediária para ambas as formas[23].

Como principal produto secretor dos adipócitos, a adiponectina atua de maneira autócrina e parácrina dentro do tecido adiposo, e de maneira endócrina nos tecidos distais[24]. Os efeitos autócrinos são ilustrados por seu papel na diferenciação dos adipócitos. Há indução maior do que 100 vezes do mRNA da adiponectina ao longo do curso da diferenciação das células adiposas[25]. Igualmente, em experimentos envolvendo adipócitos que super-expressam adiponectina, a diferenciação celular foi acelerada, o que levou a aumento do acúmulo de lipídios e da atividade de transporte da glicose responsiva à insulina em células inteiramente diferenciadas. Assim, a adiponectina promove diferenciação dos adipócitos e aumento da sensibilidade à insulina[25,26]. Além disso, estudos recentes *in vivo* e *in vitro* forneceram evidências de uma alça de *feedback* reguladora, pela qual a adiponectina regula para baixo sua própria produção e a expressão de seu receptor[27]. Além da capacidade de regular sua própria produção, a adiponectina atua como fator autócrino e parácrino para inibir a secreção pelos adipócitos de interleucinas 6 e 8, proteína-1$\alpha$/β inflamatória dos macrófagos e proteína–1 quimiotática dos monócitos, os quais, por sua vez, podem inibir o armazenamento de lipídios e a sensibilidade à insulina nos adipócitos[24,28].

A adiponectina também pode atuar como fator endócrino. Foi demonstrado que a administração de adiponectina provoca um aumento na fosforilação insulino-estimulada da tirosina no receptor de insulina em músculo, tanto em roedores quanto em humanos[29,30]. Esse efeito pode contribuir para a

melhora da sensibilidade à insulina. Segundo Bacha e col., os níveis de adiponectina são responsáveis por 73% da variação na sensibilidade à insulina[31].

## *FUNÇÕES BIOLÓGICAS DA ADIPONECTINA*

### Ação sensibilizadora à insulina

Estudos *in vitro* e *in vivo* demonstram uma forte correlação entre sensibilidade à insulina e níveis de adiponectina[31-38]. Yamauchi e col. demonstraram melhora da sensibilidade à insulina e da hiperglicemia em modelos animais de obesidade, diabetes e lipoatrofia após a infusão sistêmica de doses fisiológicas de adiponectina[29]. Além disso, estudos utilizando *clamp* euglicêmico hiperinsulinêmico mostram que o aumento agudo dos níveis de adiponectina circulantes através de infusão, melhora a supressão da produção hepática de glicose induzida pela insulina[36]. Em estudo longitudinal e prospectivo, Hotta e col., demonstraram que os níveis circulantes de adiponectina decrescem paralelamente à progressão da resistência à insulina durante o desenvolvimento do Diabetes Mellitus (DM) tipo 2 em macacos Rhesus geneticamente predispostos à resistência à insulina[35]. Nesses animais, a queda dos níveis de adiponectina precede o desenvolvimento da hiperglicemia. A correlação positiva mais forte observada nesse estudo foi com a taxa de captação de glicose estimulada pela insulina (valor M), um indicador de sensibilidade à insulina. Também em humanos, verificou-se que níveis diminuídos de adiponectina são um fator de risco para o desenvolvimento do DM tipo 2[39,40].

Os efeitos sensibilizadores da insulina pela adiponectina parecem ser mediados pela fosforilação de AMPK e PPARα no músculo esquelético e no fígado. No músculo esquelético, a ativação da AMPK leva ao aumento da oxidação de ácidos graxos livres e captação de glicose. A ativação do PPARα pela adiponectina também estimula a oxidação de ácidos graxos e leva ao decréscimo do conteúdo de triglicérides no músculo, o que contribui para a melhora na transmissão do sinal insulínico[29]. No fígado, a ativação da AMPK leva à redução de moléculas envolvidas na gliconeogênese e aumento da oxidação de ácidos graxos livres. A ativação do PPARα também estimula a oxidação de ácidos graxos livres e a diminuição do conteúdo de triglicérides no fígado. Essas alterações promovem aumento da sensibilidade à insulina *in vivo*[41].

Há dados que sugerem ainda um modo de ação central da adiponectina. A AMPK é envolvida na regulação hipotalâmica do comportamento alimentar e a adiponectina pode modular, via AMPK, o comportamento alimentar, provavelmente dentro da via da melanocortina[42].

**Ação anti-aterosclerótica**

A adiponectina tem efeitos biológicos nas células vasculares, incluindo células endoteliais, macrófagos e células da musculatura lisa.

A hipoadiponectinemia está associada com disfunção endotelial[43]. Os efeitos da adiponectina nas células endoteliais são mediados pelo óxido nítrico, uma vez que ela reduz a supressão da atividade da óxido nítrico sintase (eNOS) induzida pela LDL oxidada e estimula a produção de óxido nítrico através

da via dependente da PI3K envolvendo a fosforilação da eNOS através da AMPK[44,45].

Nos macrófagos, a adiponectina inibe a expressão do SRA-1 (*scavenger receptor class A-1*), resultando em diminuição da captação de LDL oxidada e inibição da formação de células espumosas[46]. As células espumosas produzem vários tipos de metaloproteinases de matriz, as quais induzem ruptura das placas ateroscleróticas. A adiponectina aumenta a expressão e secreção de inibidores dessas metaloproteinases, via indução de IL-10, prevenindo, conseqüentemente, a ruptura dessas placas[47].

A adiponectina inibe a proliferação e migração de células da musculatura lisa vascular. Vários fatores ofensivos, como a LDL oxidada, estímulos inflamatórios e estresse oxidativo podem causar danos vasculares. Nessas situações, a adiponectina pode se acumular nas artérias danificadas e proteger contra o desenvolvimento da aterogênese[48,49]. Uma evidência *in vivo* do papel da adiponectina na aterosclerose é dada pela demonstração de que camundongos com *knockout* da adiponectina apresentam maior espessamento da neoíntima e aumento da proliferação de células da musculatura lisa em artérias submetidas a uma lesão mecânica. A suplementação de adiponectina a esse modelo animal atenua a proliferação da neoíntima[37].

**Ação antiinflamatória**

A inflamação tem um papel importante no desenvolvimento da aterosclerose. O fator de transcrição NFκB induz a expressão de citocinas e

moléculas de adesão no processo inflamatório. A adiponectina inibe a ativação do NFκB induzido pelo TNF-α sem afetar outros sinais mediados por ele[50].

## *VARIANTES NO GENE DA ADIPONECTINA*

Baixos níveis de adiponectina têm sido associados com obesidade, resistência à insulina e aumento no risco de desenvolvimento de DM tipo 2 em diferentes estudos[21,51-53]. Além disso, estima-se que uma proporção substancial (30 – 70 %) da variabilidade dos níveis plasmáticos de adiponectina seja regulada por fatores genéticos[54]. Assim sendo, é possível que variantes no gene ADIPOQ possam modular os níveis plasmáticos de adiponectina, bem como o risco para o desenvolvimento de resistência à insulina e DM tipo 2. De fato, variantes comuns e raras foram genotipadas em diferentes grupos étnicos e uma modulação genética para essas condições pôde ser demonstrada em diversos estudos[55-57].

O gene ADIPOQ é muito polimórfico: vários polimorfismos foram encontrados nos *exons*, *introns* e regiões promotoras. Associações com adiponectinemia e/ou fenótipos relacionados à síndrome metabólica têm sido reportados para três grupos de variantes em várias populações: nas seqüências 5´(-12823, -11426, -11391 e -11377); na região do *exon* 2 e *intron* 2 (mutações +45 e +276) e no *exon* 3 (G48R, G90S, Y111H, R112C e I164T)[58].

Kondo e col.,[59] fizeram o rastreamento de mutações no gene da adiponectina e verificaram que a freqüência da mutação I164T foi significantemente mais elevada em portadores de DM tipo 2 quando comparada a controles pareados para idade e índice de massa corpórea. Além disso, as concentrações de adiponectina plasmática em indivíduos com a mutação I164T

foram inferiores às observadas em indivíduos sem a mutação e todos os indivíduos com a mutação apresentavam alguma característica da síndrome metabólica. Dois polimorfismos freqüentes, uma substituição silenciosa no *exon* 2 (45T-G) e uma substituição de G por T no *intron* 2 (276G-T) foram significantemente associados com DM tipo 2 em japoneses[55], com obesidade em alemães[56] e com obesidade e outros componentes da Síndrome Metabólica em não diabéticos italianos[57].

As mutações R112C, I164T, R221S e H241P foram detectadas exclusivamente em japoneses, enquanto que as mutações G90S, R92X e Y111H só foram encontradas em caucasianos. Apenas a rara mutação G84R foi encontrada nos dois grupos[60].

### *POPULAÇÃO NIPO-BRASILEIRA*

O Brasil apresenta a maior população japonesa fora do Japão, provenientes de um movimento migratório que se estendeu de 1908 até o inicio da década de 1960, com uma interrupção de 1941 a 1952 (período da Segunda Guerra Mundial e pós-guerra imediato)[61]. Atualmente, há no Brasil cerca de 1,5 milhões de japoneses e descendentes, sendo que 80% residem no estado de São Paulo.

Estudos realizados na década de 1980 na população nikkei (segunda e terceira gerações) dos Estados Unidos mostram uma prevalência de DM três a quatro vezes superior àquela observada no Japão[62]. Entretanto, estudos mais recentes mostram que essa diferença tende a diminuir, à medida que o Japão passa a incorporar hábitos ocidentais.

Diante da representatividade dos nipo-brasileiros na população brasileira e do impacto da imigração na saúde desses indivíduos, surgiu a idéia de aprofundar as investigações relativas à morbidade e mortalidade desse grupo populacional no Brasil. No final da década de 1980, constituiu-se então, no Departamento de Medicina Preventiva da Escola Paulista de Medicina, o grupo multiprofissional de pesquisadores para estudos sobre a população nipo-brasileira coordenado, até seu falecimento, pelo Prof. Dr. Magid Iunes e, desde então, pela Profa. Dra. Sandra Roberta G. Ferreira, e denominado *Japanese-Brazilian Diabetes Study Group* (JBDSG) para fins de divulgação de trabalhos no meio científico[61].

Inicialmente, foram aplicados questionários bilíngües na cidade de São Paulo com a intenção de avaliar a prevalência de DM auto-referido entre japoneses e seus descendentes. Notou-se que, de fato, a prevalência era maior do que aquela encontrada na população brasileira em geral e na do Japão, sendo similar à encontrada entre nipo-americanos de Seattle[63]. No entanto, a necessidade de se avaliar a real prevalência de DM entre nipo-brasileiros, acabou levando à procura de um local com número representativo de membros da comunidade e que contasse com facilidade de acesso ao centro de coleta e oferta de recursos humanos e de infra-estrutura para a realização de exames médicos e laboratoriais. Após visitas a inúmeras instituições em diferentes municípios, optou-se pela cidade de Bauru, no interior do estado de São Paulo. A partir daí, definiu-se como população-alvo aquela formada por indivíduos de origem japonesa, de primeira e segunda gerações, não-miscigenados e com idade entre 40 e 79 anos[61].

O projeto de estudo do diabetes e doenças associadas iniciou-se em 1992 com o levantamento da população nikkei de Bauru, então formada por cerca de 3000 indivíduos entre 40 e 79 anos. Todos os indivíduos de primeira geração e um terço dos de segunda geração, de ambos os sexos, foram convidados a participar da primeira fase de estudos (1993). No total, 647 indivíduos foram examinados e a prevalência de DM foi de 22,6%, superior àquela observada na população geral brasileira e entre os que viviam no Japão[61].

A segunda fase do estudo (2000) foi mais abrangente, analisando todos os indivíduos de primeira e segunda gerações, a partir dos 30 anos de idade. O número de casos novos de DM ocorridos nesse período foi alarmante, e a prevalência da doença já atingia 36,1%, uma das maiores já registradas em todo o mundo[64].

A possibilidade que se aventa é que os nipo-brasileiros, geneticamente predispostos ao desenvolvimento de resistência à insulina, quando expostos a um ambiente desfavorável apresentam uma série de alterações metabólicas, entre elas, o DM tipo 2. Além da identificação de fatores de risco ambientais, a identificação de fatores de risco genético permitirá adoção precoce de medidas preventivas e possibilidade de um tratamento mais adequado, com conseqüentes implicações prognosticas.

# *OBJETIVOS*

Tendo em vista os aspectos abordados acima, os objetivos do presente estudo foram:

- Investigar se baixos níveis plasmáticos de adiponectina constitui fator de risco independente para o desenvolvimento de intolerância à glicose na população nipo-brasileira (Artigo 1).

- Investigar a freqüência, significância clínica e a contribuição para a ocorrência de DM em nipo-brasileiros dos polimorfismos T45G, G276T e A349G, e das mutações no *exon* 3 do gene ADIPOQ (Artigo 2).

- Reportar uma nova mutação no gene da adiponectina associada com hipoadiponectinemia em nipo-brasileiros (Artigo 3).

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# Plasma adiponectin levels and incident glucose intolerance in Japanese–Brazilians: A seven-year follow-up study

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## ABSTRACT

The objective of this study was to investigate whether decreased baseline adiponectin levels are an independent risk factor for development of glucose intolerance in a population-based study of Japanese–Brazilians, a group with one of the highest prevalence rates of diabetes worldwide. We examined 210 Japanese–Brazilians (97 male and 113 female, aged 56.7 ± 10.1 years) with normal glucose tolerance (NGT). Plasma adiponectin, insulin, fasting and 2-h plasma glucose and lipid profile were evaluated at baseline and also at 7-year follow-up. Plasma adiponectin levels were significantly lower in glucose intolerance progressors compared with subjects who remained NGT. By increasing tertiles of adiponectin, the frequencies of subjects who progressed to glucose intolerance were 40%, 33% and 27% and the frequencies of subjects who remained NGT were 13%, 35% and 52% ($\chi^2$ = 15.8, $p$ = 0.001). Logistic regression analyses showed that adiponectin levels (OR for the highest versus lowest tertile: 0.31; 95% CI: 0.12–0.84, $p$ = 0.021), male sex (OR: 2.61, 95% CI: 1.21–5.65, $p$ = 0.015), fasting plasma glucose (OR: 3.05, 95% CI: 1.35–6.91, $p$ = 0.008) and waist circumference (OR: 1.04, 95% CI: 1.00–1.08, $p$ = 0.046) were independent risk factors for the progression to glucose intolerance. In conclusion, low plasma levels of adiponectin is one of several independent predictors of glucose intolerance in a Japanese–Brazilian population.

## 1. Introduction

Diabetes mellitus is a serious and costly disease that profoundly impacts health and longevity. Thus, it may be more efficient to identify individuals at risk in order to provide measures to prevent the progression into diabetes.

Adiponectin, the gene product of the most abundant gene transcript 1 (apM1), is a collagen-like protein that is exclusively expressed and secreted by the adipose tissue[1]. Recent data have demonstrated a strong correlation between plasma adiponectin and insulin sensitivity both *in vivo* and *in vitro* studies[2,3]. Decreased concentrations are seen in states of insulin resistance, including type 2 diabetes and obesity, while improvement of insulin sensitivity by weight loss or administration of thiazolidinediones has been shown to increase plasma adiponectin concentrations[4-7]. Furthermore, circulating adiponectin levels have been shown to decrease in parallel with the progression of insulin resistance and to precede diabetes development in rhesus monkeys genetically predisposed to insulin resistance[2]. The predictive value of low adiponectin for future development of type 2 diabetes in humans has been previously demonstrated in a few population groups[8-12]. Japanese–Brazilians show a high prevalence of glucose metabolism disturbances and incidence rates of diabetes mellitus, being the prevalence rates of diabetes one of the highest worldwide[13]. In this population, after 7-year follow-up, we observed an overall high proportion of subjects (approximately 75%) in all categories of glucose intolerance. However, a greater increase was observed in the category of isolated impaired fasting glucose (from 3.3% to 19.3%). Also, a gradual and statistically significant increase in mortality rates was observed as fasting or 2-h plasma glucose elevated[14]. In this study, as part of an 7-year follow-up of Japanese–Brazilians, we examine the importance of low levels of plasma adiponectin as a predictor for the development of glucose intolerance in this population.

## 2. Materials and Methods

### 2.1. Study population

In 1993 we started to follow-up a sample of subjects from the Japanese–Brazilian community living in Bauru, a developed city of the São Paulo State, to investigate the prevalence of type 2 diabetes and its associated risk factors. This study involved all individuals aged 40–79 years from the first generation (Issei) and a random sample of one-third (with additional 20%) of those from the second generation (Nisei) from the same age-group. The entire population of second generation was listed in alphabetical order and every third subject was selected to compose the Nisei group studied. The percentage of refusal to participate was 11.8% for Issei and 11.1% for Nisei. Six hundred and forty-seven first-generation (37.3%) and second-generation (62.7%) Japanese–Brazilians aged 40–79 years went through an interview with questionnaires about demographic and social aspects, medical history and nutritional survey, assessed by food frequency questionnaire. Clinical examination was performed including anthropometric (weight, height and waist circumference) and blood pressure measurements. Fasting blood samples for glucose, insulin, lipids and adiponectin were obtained. A 75 g solution of anhydrous glucose was administered and 2 h later another blood sample was obtained for glucose and insulin measurements. Seven years later (from 1999 to 2000) the glucose tolerance status of 394 subjects was reexamined (follow-up rate: 61%) and the same parameters evaluated at baseline were evaluated again. Of the original study sample, 69 subjects (10.6%) had died, 57 (8.7%) had moved and 127 (19.7%) refused to participate. For this study we enrolled 210 individuals (97 male and 113 female, aged 56.7 ± 10.1 years) with normal glucose tolerance according to the 1993 OGTT and suitable baseline plasma specimens.

## 2.2. Laboratory methods

Plasma glucose was determined by the glucose-oxidase method. Cholesterol contents of lipoproteins fractions and triglycerides were measured enzymatically. Insulin was determined by a monoclonal antibody-based immunofluorimetric assay[15]. Insulin resistance was estimated by indirect measures which included fasting insulin concentrations and homeostasis model assessment (HOMA-IR)[16]. Glucose tolerance status was based on 1999 WHO criteria[17]. At the 7-year follow-up 52 subjects had normal glucose tolerance (NGT), 42 had impaired fasting glucose (IFG), 73 had impaired glucose tolerance (IGT) and 43 had diabetes (DM). Since the categories of IFG and IGT are not mutually exclusive, subjects meeting criteria for both categories were classified as IGT. Fasting plasma adiponectin concentrations were measured by radioimmunoassay (Linco Research, St. Charles, MI, USA) in baseline plasma specimens that had been stored at −20 °C. This assay has a sensitivity of 1 ng/ml with an intra- and inter-assay coefficients of variation of 1.8–6.2% and 6.9–9.3%, respectively.

This study was approved by the Ethics Committe of Escola Paulista de Medicina, Universidade Federal de São Paulo and all participants were informed about the aims of the study and gave their consent.

## 2.3. Statistical analysis

All data are shown as mean ± SD. Differences in continuous variables among the subgroups were evaluated by unpaired Student´s t-test. Data were tested for normal distribution with Kolgomorov–Smirnov test and non-normally distributed parameters were logarithmically transformed to approximate normal distribution. The non-parametric Mann–Whitney test was used on parameters which were still not normally distributed after transformation. Baseline adiponectin concentrations were divided into tertiles (≤ 5.27; 5.28–9.90 and ≥ 9.91 μg/ml) and the relationships between adiponectin and development of glucose intolerance were evaluated by $\chi^2$ analyses. In order to identify independent associations

between development of glucose intolerance by the 7-year follow-up examinations and parameters collected at baseline, logistic regression was used. An odds ratio for each tertile of adiponectin was estimated. Variables were entered into the model due to a *p*-value < 0.20 in univariate analyses. Potential interactions between the covariates were calculated, but were excluded from the model due to $p > 0.05$.

## 3. Results

At the 7-year follow-up a total of 158 of 210 individuals, who had normal glucose tolerance at baseline (75.2%, 95% CI: 68.8–80.9%) developed glucose intolerance (IGT, IFG or DM). The comparison of subjects' baseline characteristics showed a worse metabolic profile among those who progressed to glucose intolerance (Table 1). Subjects who remained NGT had lower mean values of BMI, waist circumference, fasting and 2-h plasma glucose concentrations, triglycerides and higher mean values of HDL than those who progressed to glucose intolerance. Also, plasma adiponectin levels were significantly higher in subjects who remained NGT compared with the glucose intolerance progressors. Plasma adiponectin concentrations were significantly higher in women (11.01 ± 7.29 μg/ml) than in men (6.97 ± 4.59 μg/ml; $p < 0.001$) and there was a higher percentage of men who progressed to glucose intolerance compared to women (87.6% versus 64.6%, $p < 0.001$). Next, we examined the relationships between glucose intolerance development and adiponectin levels. Baseline adiponectin levels were divided in tertiles and the frequency of subjects with NGT or glucose intolerance by the 7-year follow-up examination is shown in Fig. 1. By increasing tertiles of adiponectin, the frequencies of subjects who progressed to glucose intolerance fell progressively being 40%, 33% and 27% whereas the frequencies of subjects who remained NGT rose, being 13%, 35% and 52% ($\chi^2 = 15.8$, $p = 0.001$).

In order to identify risk factors for the progression to glucose intolerance in this population, we performed a multiple logistic regression. Sex, waist circumference, fasting plasma glucose, diastolic blood pressure, HDL cholesterol,

triglycerides and adiponectin levels were used as covariates. Considering the possibility of multicolinearity between waist circumference and BMI, BMI was excluded from the multivariate analyses and waist circumference was included as representative of trait related to obesity. Table 2 shows that adiponectin level is an independent factor for developing glucose intolerance. The odds ratios by increasing tertiles of adiponectin were 1.0, 0.33 (95% CI: 0.12–0.90) and 0.31 (95% CI: 0.12–0.84). Male sex and fasting plasma glucose were also independent risk factors for the progression to glucose intolerance, as was waist circumference (Table 2).

## 4. Discussion

Type 2 diabetes, a worldwide growing health problem, has insulin resistance as a fundamental element. But, despite of intensive investigations little is know about the factors responsible for insulin resistance in persons at increased risk of developing the disease.

In this prospective study of Japanese–Brazilians with normal glucose tolerance we examined the relationships between baseline adiponectin concentrations and the development of glucose intolerance. At the 7-year follow-up 75.2% of individuals developed glucose intolerance. This is a very high rate of conversion, showing that diabetes mellitus and its long-term complications should be considered as one of the major public health problems in this population. Our data also emphasize the need of primary prevention programs in this community. There is some evidence of ethnic variations in adiponectin concentrations[18,19]. Indeed, plasma adiponectin levels found in Japanese–Brazilians were similar to those in native Japaneses, since both populations are though to be genetically identical. We found higher adiponectin levels in women than in men. Even after adjusting for possible confounding factors (data not shown), gender remained an independent predictor of serum adiponectin levels. This observation is in agreement with previous studies in humans[20-23] and in mice[24].

We demonstrated that low baseline levels of adiponectin were significantly associated with the risk of developing glucose intolerance over 7 years of follow-

up. This association was independent of sex, age, waist circumference, as a measure of visceral obesity and other modifiers of diabetes risk. Subjects in the lowest tertile of adiponectin developed glucose intolerance 3.2 times (95% CI: 1.2–8.3) more than those in the highest tertile ($p$ = 0.021). Adiponectin may exert its protective effect in the development of glucose intolerance by improving insulin action and secretion. Weyer et al.,[25] reported in Caucasian and Pima Indians that adiponectin levels are closed related to the degree of insulin resistance. Other investigators have presented data confirming this connection[20-26]. Also, decreased tyrosine phosphorylation of muscle insulin receptor was associated to low plasma adiponectin concentrations[26]. Recently, Rakatzi et al.,[27] identified a novel function of adiponectin consisting of the inhibition of cytokine and fatty acid induced apoptosis and dysfunction of pancreatic beta cells. Previous studies demonstrated the predictive value of low adiponectin levels for future development of type 2 diabetes in various ethnic groups such as Pima Indians, Asian Indians, Japaneses, African Americans and Caucasians[8,9,11,12]. However, our study showed a predictive value of low adiponectin levels for all categories of glucose intolerance (IFG, IGT and DM).

These data have potential implications for pathophysiology, screening and prevention of glucose metabolism disturbances. Low levels of adiponectin in apparently healthy subjects may help to identify high-risk individuals for glucose intolerance. Therefore, preventive measures adopted early may reduce the prevalence of these disturbances. It was shown previously that weight reduction therapy increased plasma adiponectin concentration in nondiabetic and diabetic subjects and in severely obese subjects following bariatric surgery[4,23]. Also, the administration of thiazolidinediones increased adiponectin levels in non-diabetic and type 2 diabetic subjects[5-7]. However, it remains to be determined whether an increase of adiponectin levels per se will lead to a reduction in risk of glucose metabolism disturbances.

A limitation of the present study is the relatively low follow-up rate. Of the original study sample, 383 individuals had NGT at baseline and for this study 210 of them were enrolled. However, no difference in baseline characteristics such as age, BMI, waist circumference, sex distribution and fasting plasma glucose levels

(data not shown) was found between individuals enrolled and non-enrolled. Therefore, it probably did not cause any bias.

In summary, we found that low plasma levels of adiponectin were an independent predictor over 7 years to glucose intolerance in a subset of Japanese–Brazilian subjects with normal baseline glucose tolerance. It is suggested that adiponectin may have a role in the mechanisms of glucose intolerance development. However, a relatively raised fasting blood glucose within the normal range remains the strongest predictor of future type 2 diabetes in this population.

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**Table 1:** Baseline characteristics of the subjects who remained NGT and the ones who progressed to glucose intolerance at 7-year follow-up.

| | NGT | Glucose intolerance | *p* |
|---|---|---|---|
| **Age (years)** | 57.4 ± 11.2 | 56.4 ± 9.8 | 0.511[a] |
| **BMI (kg/m$^2$)** | 22.9 ± 3.2 | 24.8 ± 3.7 | 0.001[a] |
| **Waist (cm)** | 79.9 ± 11.0 | 86.1 ± 9.6 | <0.001[a] |
| **Men** | 83.1 ± 7.8 | 87.5 ± 8.6 | 0.101[a] |
| **Women** | 79.0 ± 11.7 | 84.4 ± 10.4 | 0.012[a] |
| **Fasting plasma glucose (mmol/l)** | 4.8 ± 0.4 | 5.1 ± 0.5 | 0.001[a] |
| **2 h plasma glucose (mmol/l)** | 5.1 ± 0.9 | 5.5 ± 1.2 | 0.006[b] |
| **Fasting insulin (pmol/l)** | 27.5 ± 27.9 | 33.7 ± 57.3 | 0.764[c] |
| **Sistolic blood pressure (mmHg)** | 123.5 ± 17.1 | 127.0 ± 18.1 | 0.228[a] |
| **Diastolic blood pressure (mmHg)** | 76.0 ± 10.0 | 78.7 ± 10.7 | 0.114[a] |
| **Cholesterol (mmol/l)** | 5.5 ± 1.0 | 5.5 ± 1.3 | 0.937[a] |
| **HDL (mmol/l)** | 1.2 ± 0.3 | 1.1 ± 0.3 | 0.004[a] |
| **Triglycerides (mmol/l)** | 1.7 ± 2.0 | 1.8 ± 1.2 | 0.038[c] |
| **Adiponectin (µg/ml)** | 12.2 ± 7.5 | 8.0 ± 5.6 | <0.001[d] |
| **HOMA-IR** | 5.9 ± 6.0 | 7.7 ± 12.6 | 0.975[c] |

Data are means ± S.D.

[a] *t*-Test.

[b] *t*-Test to unequal variance.

[c] Mann–Whitney test.

[d] *t*-Test performed on log transformations Data are means ± S.D.

**Table 2:** Multiple logistic model for identification of prognostic factors to glucose intolerance progression.

| | Odds ratio | 95% CI | p |
|---|---|---|---|
| **Sex (M/F)** | 2.61 | [1.21–5.65] | 0.015 |
| **Adiponectin (5.28–9.90 vs. 0.85–5.27)** | 0.33 | [0.12–0.90] | 0.030 |
| **Adiponectin (>9.90 vs. 0.85–5.27)** | 0.31 | [0.12–0.84] | 0.021 |
| **Fasting plasma glucose (mmol/l)** | 3.05 | [1.35–6.91] | 0.008 |
| **Waist (cm)** | 1.04 | [1.00–1.08] | 0.046 |

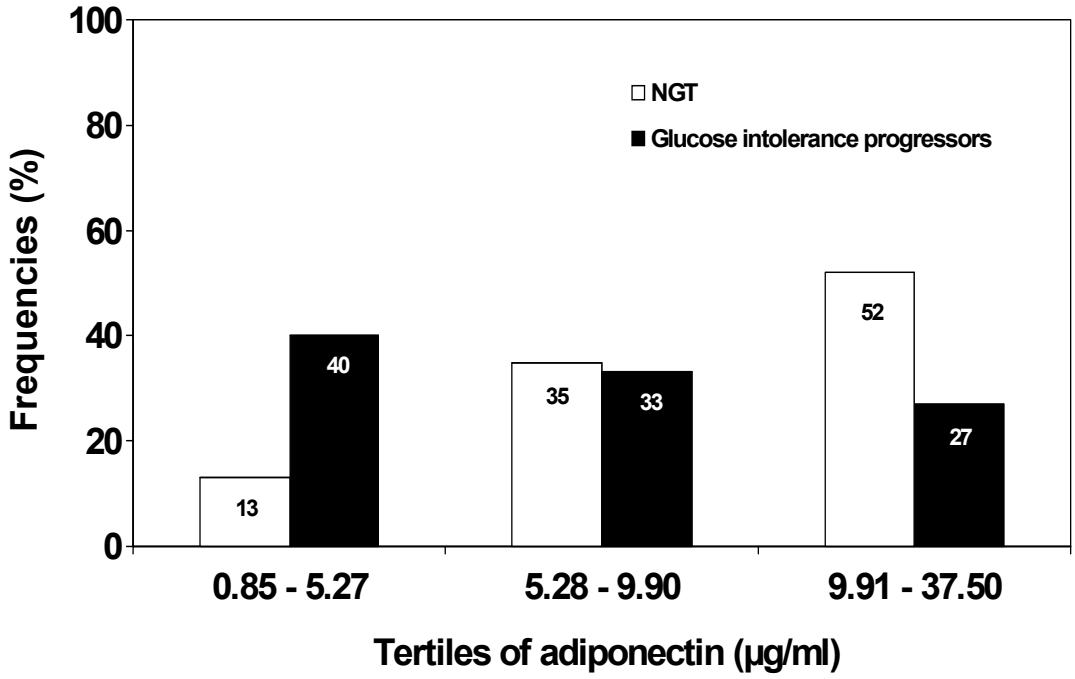


**Figure 1:** Distribution of subjects who remained NGT and those who progressed to glucose intolerance at 7-year follow-up according to tertiles of baseline adiponectin.

# Association of genetic variants in the adiponectin encoding gene (ADIPOQ) with type 2 diabetes in Japanese-Brazilians

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## ABSTRACT

**Aim:** To assess the contribution of ADIPOQ variants to type 2 diabetes in Japanese-Brazilians.

**Methods:** we genotyped 200 patients with diabetes mellitus (100 male and 100 female, aged 55.5 ± 10.8 years) and 200 control subjects with NGT (72 male and 128 female, aged 54.0 ± 13.4 years).

**Results:** whereas each polymorphism studied (T45G, G276T and A349G) was not significantly associated with type 2 diabetes mellitus, the haplotype GGA was over-represented in our diabetic population (9.3% against 3.1% in NGT individuals, p = 0.0003). Also, this haplotype was associated with decreased levels of adiponectin. We also identified three mutations in exon 3: I164T, R221S and H241P but, owing the low frequencies of them, associations with type 2 diabetes could not be evaluated. The subjects carrying the R221S mutation had plasma adiponectin levels lower than those without the mutation (1.97 ± 0.80 µg/ml vs 8.08 ± 6.27 µg/ml, p= 0.015). Similarly, the I164T mutation carriers had mean plasma adiponectin levels lower than those non-carriers (3.73 ± 0.88 µg/ml vs 8.08 ± 6.27 µg/ml) but this difference was not significant (p= 0.23).

**Conclusions:** we identified in the ADIPOQ gene a risk haplotype for type 2 diabetes that affects plasma adiponectin levels in the Japanese-Brazilian population.

Key words: adiponectin, Japanese-Brazilian, single nucleotide polymorphisms, ADIPOQ gene

## 1. Introduction:

Adiponectin, an adipose tissue-specific protein, is secreted and exists in the circulation of healthy individuals at high concentrations, accounting for approximately 0.01% of total plasma protein. It plays an important role in modulating insulin sensitivity and hypoadiponectinemia is seen in obesity, type 2 diabetes and coronary artery disease, conditions closely related to insulin resistance (Arita et al., 1999; Hotta et al., 2000; Weyer et al., 2001). Adiponectin is encoded by the ADIPOQ gene located on chromosome 3q27, a region with evidence for linkage with type 2 diabetes and the metabolic syndrome. The ADIPOQ gene spans 16 kb, contains three exons (translation starts at exon 2 and ends at exon 3) (Takahashi et al., 2000; Schaffler et al., 2000). Frequent and rare variants of ADIPOQ gene were genotyped in large data sets from various ethnics groups. The variants T45G and G276T are the most common and have been the most widely studied, both separately and as haplotypes. These variants have been associated with type 2 diabetes in some studies (Hara et al., 2002; Stumvoll et al., 2002; Menzaghi et al., 2002). However, depending on the population studied results have been inconsistent. Less common point mutations located in exon 3 were also identified. The I164T mutation, detected exclusively in the Japanese population, was associated with type 2 diabetes, metabolic syndrome and coronary artery disease (Kondo et al., 2002; Ohashi et al., 2004).

The Japanese-Brazilians show a high prevalence of glucose metabolism disturbances and incidence rate of diabetes mellitus, being the prevalence rates of diabetes one of the highest worldwide (Gimeno et al., 2002). We previously described that low plasma concentrations of adiponectin is one independent predictor of glucose intolerance in this population (Vendramini et al., 2006). In the present study, we investigated the contribution of SNPs T45G, G276T and A349G of the ADIPOQ gene to diabetes in the Japanese-Brazilian population. Also, the frequency and clinical significance of less common point mutations in exon 3 were examined.

## 2. Subjects and Methods:

### 2.1.Study subjects

Mutation screening was carried out on genomic DNA from 200 randomly selected patients with diabetes mellitus (100 male and 100 female, aged 55.5 ± 10.8 years) and 200 age-matched control subjects with normal glucose tolerance (72 male and 128 female, aged 54.0 ± 13.4 years). All the individuals were recruited from the Japanese-Brazilian Diabetes Study Group, a survey designed to estimate the prevalence and incidence of diabetes and associated diseases in a Japanese-Brazilian population living in Bauru, São Paulo, Brazil. Details on the selection and recruitment of the sample population have been previously described (Gimeno et al., 2002). All individuals went through an interview with questionnaires about demographic and social aspects and medical history. Clinical examination was performed including anthropometric (weight, height and waist circumference) and blood pressure measurements. Fasting blood samples for glucose, insulin, lipids and adiponectin were obtained. A 75g solution of anhydrous glucose was administered and two hours later another blood sample was obtained for glucose and insulin measurements. This study was approved by the Ethics Committe of Escola Paulista de Medicina, Universidade Federal de São Paulo, and all participants were informed about the aims of the study and gave their consent.

### 2.2.Methods:

Plasma glucose was determined by the glucose-oxidase method. Cholesterol contents of lipoproteins fractions and triglycerides were measured enzymatically. Insulin was determined by a monoclonal antibody-based immunofluorimetric assay (PerkinElmer, Wallac Oy, Turku, Finland). Insulin resistance was estimated by indirect measures which included fasting insulin concentrations and homeostasis model assessment (HOMA-IR) (Matthews et al., 1985). Glucose tolerance status was based on 1999 WHO criteria (Alberti et al., 1999). Fasting plasma adiponectin concentrations were measured by radioimmunoassay (Linco Research, St Charles, MI, USA). This assay has a sensitivity of 1 ng/ml with an intra and interassay coefficients of variation of 1.8-6.2% and 6.9-9.3%, respectively.

Blood samples were obtained from each subject and genomic DNA was extracted from peripheral blood leukocytes using a commercial kit (Puregene DNA Isolation Kit, Gentra System, Minneapolis, MN, USA). The entire translated region of adiponectin gene was amplified by PCR using two pairs of specific primers: 5'AGAAAGCAGCTCCTAGAAGT3' and 5'GGCACCATCTACACTCATCC3' which flank the region containing exon 2, and 5'CCTAAGGGAGACATCGGTGA3' and 5'ATTGACTTTGGGGCTGTTTG3' which flank the region containing exon 3. The PCR products were directly sequenced on an ABI Prism 3100 Genetic Analyzer (Applied Biosystems, CA, USA). Numbering of nucleotides: the A of the ATG of the initiator Met codon was denoted as +1 (Gen Bank accession number D45371.1) and amino acids were numbered according to Gen Bank accession number NP_004788.

**2.3.Statistical analysis:**

For continuous variables, data are given as mean± SE. The chi-square test was used to compare the genotype or allele frequencies between study groups. Differences in continuous variables between the two groups were calculated by the Student t test. Haplotype frequency, Hardy-Weinberg equilibrium and linkage disequilibrium statistics were obtained through the use of Haploview software. Association analysis for alleles and haplotypes for the dichotomic variable diabetes was conducted using Haploview. Association analysis for genotypes were conducted using SPSS ver. 13.0. Association analysis for alleles and haplotypes for adiponectin levels were conducted using the Hapstat software. A p value < 0,05 was considered significant.

**3. Results:**

The clinical characteristics of type 2 diabetes patients and control subjects are shown in Table 1. Patients with type 2 diabetes had significantly higher BMI and HOMA-IR index and lower plasma adiponectin levels than control subjects. The genotype and allele frequencies of SNPs T45G, G276T and A349G are shown in Table 2. No significant allele or genotype association could be disclosed for the diabetes phenotype, although allele 349G tended to be less prevalent in diabetic individuals (unadjusted p-value 0.06). Adjusted p-values (gender, age and

BMI) for allelic effects also did not reach statistical significance for the diabetic phenotype. There was no evidence of Hardy-Weinberg disequilibrium for any SNP.

On Figure 1 we present the linkage disequilibrium relationship between tested markers. Considering the linkage disequilibrium structure of this particular locus we have proceeded to test whether any haplotype could be associated with an increased risk of presenting diabetes. We analyzed the 4 haplotypes with frequency > 5%: TGA: 0.411; TTA: 0.278; GGG: 0.224 and GGA: 0.062. A positive association was observed with haplotype GGA (45G + 276G + 349A), that was over-represented in our diabetic population (9.3% in type 2 diabetic individuals against 3.1% in normal glucose tolerant individuals, p = 0.0003). On the contrary, the GGG haplotype was more frequent in normal glucose tolerant individuals as compared to diabetic individuals (25.5% versus 19.4%, respectively, p = 0.04). Both associations remained statistically significant even after model adjustment for age (data not shown). Haplotypes were not independently associated with BMI levels.

We next examined the genotype influence on adiponectin levels. None of studied alleles showed significant association with adiponectin levels (Table 3). However, a significant haplotype effect in adiponectin levels was disclosed for the GGA haplotype (Table 4). In accordance to what would be expected, the estimated effect of the GGA haplotype is to decrease adiponectin levels.

We also investigated the influence of less common nonsynonymous point mutations located in exon 3. In the present study we identified three mutations, previously detected in the Japanese population: I164T, R221S and H241P. All the subjects with the mutations were heterozygous. The I164T mutation was found only in two diabetic subjects. The R221S was identified in two diabetic subjects and in one normal glucose tolerant individual. The H241P mutation was identified in three diabetic subjects and in four normal glucose tolerant subjects. Owing the low frequencies of these mutations, the association between them and type 2 diabetes could not be evaluated. The subjects carrying the R221S mutation had plasma adiponectin levels lower than those without the mutation (1.97±0.80 µg/ml vs 8.08 ±6.27 µg/ml, p= 0.015). Similarly, the I164T mutation carriers had mean plasma adiponectin levels lower than those non-carriers (3.73±0.88 µg/ml vs 8.08±6.27 µg/ml) but this difference was not significant (p=0.23).

## 4. Discussion

Some previous studies have shown that ADIPOQ gene variants are associated with type 2 diabetes in cross-sectional as well as prospective studies (Hara et al., 2002; Stumvoll et al., 2002; Menzaghi et al., 2002; Vasseur et al., 2003; Kondo et al., 2002; Ohashi et al., 2004). However, these associations have not been seen in all studies and the contribution of each variant in different populations is not established.

A silent T to G substitution in exon 2 (T45G) and a G to T substitution in intron 2 (G276T) have been the most widely studied variants, both separately and as haplotypes. In the Japanese population, Hara et al. found that subjects with the genotype GG at the position 45 or the genotype GG at position 276 had an increase risk of type 2 diabetes (Hara et al., 2002). Also, in Chinese people, the T45G was the only polymorphism significantly associated with the risk of persistent hyperglycemia at 5-year follow-up and haplotypes formed by the addition of other SNPs did not confer greater association (Tso et al., 2006). However, Gu et al studying Swedish Caucasians found no significant differences of allele frequencies for SNPs 45 and 276 between type 2 diabetic patients and non diabetic controls (Gu et al., 2004). Similarly, in the Nurses' Health Study polymorphisms at positions +45 and +276 were not associated with risk of diabetes and the haplotype defined by these two SNPs was also not associated with diabetes risk (Hu et al., 2004). Here, studying Japanese-Brazilians, a population characterized by a high prevalence of glucose intolerance, we provided evidence that a haplotype defined by SNPs 45, 276 and 349 (GGA) contributed to the genetic risk of type 2 diabetes.

In order to test whether the effects of haplotype were due to effects on adiponectin levels, plasma adiponectin was measured in all of the subjects examined. In accordance to the observed association with type 2 diabetes, the GGA haplotype was associated with decreased levels of adiponectin. The biology of this association is unclear. One possibility is that the GGA haplotype may act decreasing adiponectin expression; however none of the three SNPs are functional. The T45G is in exon 2 and is a silent polymorphism and G276T and A349G are in intron 2 where no regulatory sites have been described. Thus, this

haplotype is more likely to be in linkage disequilibrium with one or more functional variants affecting plasma adiponectin levels.

In addition to common polymorphisms, rare nonsynonymous mutations located in exon 3 have been described in ADIPOQ gene (Kondo et al., 2002). In the present study we identified the I164T, R221S and H241P mutations previously reported in the Japanese population. The I164 mutation was found only in two subjects, both with type 2 diabetes. The two subjects mutation-carriers, besides diabetes, had at least one more metabolic disorder such as hypertension and dyslipidemia. Mean plasma adiponectin levels in these subjects were lower than in wild-type, but this difference was not statistically significant possibly because of the small number of patients with the mutation. This finding is in agreement with previous studies in Japanese population showing a correlation between I164T mutation and type 2 diabetes (Kondo et al., 2002) and lower plasma adiponectin levels (Kondo et al., 2002; Ohashi et al., 2004). Investing the mechanisms by which this mutation cause diabetes and hypoadiponectinemia, Waki et al. (2003) showed that the I164T mutants are not assembled into stable trimers and larger multimers, which probably resulted in impaired secretion from the cell. However, Kishida et al. (2003) found an oligomerization state similar to the wild-type, but abnormal secretion from adipose tissue.

Regarding the R221S mutation, Kondo et al. (2002) identified only one nondiabetic subject carrying this mutation, with adiponectin levels similar to the non-carriers. We found three mutation carriers with adiponectin levels lower than the non-carriers. However, more individuals carrying the R221S mutation need to be identified for better assessment of the association between this mutation and adiponectin levels.

In summary, we identified in the ADIPOQ gene a risk haplotype for type 2 diabetes that affects plasma adiponectin levels in the Japanese-Brazilian population.

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**Table 1:** Clinical characteristics of normal glucose tolerant (NGT) subjects and type 2 diabetic patients.

| | **NGT Subjects (n= 200)** | **Type 2 Diabetic Patients (n= 200)** | **p value** |
|---|---|---|---|
| **Age (years)** | 54.0 ± 13.4 | 55.5 ± 10.8 | 0.23 |
| **Sex (M/F)** | 72 / 125 | 100 / 100 | 0.0092 |
| **BMI (kg/m²)** | 22.8 ± 2.75 | 27.4 ± 3.72 | < 0.0001 |
| **HOMA IR** | 1.20 ± 0.51 | 4.89 ± 3.42 | < 0.0001 |
| **Adiponectin (µg/ml)** | 10.62 ± 6.74 | 6.48 ± 5.02 | < 0.0001 |
| **Systolic BP (mmHg)** | 123.8 ± 22.1 | 138.3 ± 24.4 | < 0.001 |
| **Diastolic BP (mmHg)** | 76.0 ± 12.6 | 82.9 ± 15.4 | < 0.001 |
| **Triglycerides (mg/dL)** | 235.7 ± 197.0 | 325.8 ± 278.4 | < 0.0001 |

**Table 2:** Genotype and allele frequencies of SNPs T45G, G276T and A349G in NGT subjects and type 2 diabetic patients (T2DM).

| SNP | Genotypes n(%) | | | | Alleles n(%) | | |
|---|---|---|---|---|---|---|---|
| **+45** | T/T | T/G | G/G | | T | G | |
| **T2DM** | 93 (46.5) | 95 (47.5) | 12 (6.0) | 0.61 | 281 (70.2) | 119 (29.8) | 0.74 |
| **NGT** | 99 (50.2) | 84 (42.6) | 14 (7.1) | | 282 (71.6) | 112 (28.4) | |
| **+276** | G/G | G/T | T/T | | G | T | |
| **T2DM** | 85 (42.5) | 104 (52.0) | 11 (5.5) | 0.25 | 274 (68.5) | 126 (31.5) | 0.18 |
| **NGT** | 97 (49.2) | 94 (47.7) | 6 (3.0) | | 288 (75.0) | 106 (25.0) | |
| **+349** | A/A | A/G | G/G | | A | G | |
| **T2DM** | 118 (61.8) | 64 (33.5) | 9 (4.7) | 0.16 | 300 (78.5) | 82 (21.5) | 0.06 |
| **NGT** | 100 (50.8) | 80 (40.60) | 12 (6.1) | | 280 (72.9) | 104 (27.1) | |

**Table 3:** Effect estimative of studied alleles on adiponectin levels.

| | **Effect estimative (p value)** |
|---|---|
| **T45 allele** | + 0.16 (0.75) |
| **G276 allele** | + 0.65 (0.23) |
| **A349 allele** | - 0.58 (0.28) |

Models adjusted for age.

Effect estimative - change in mean adiponectin levels according to allele groups.

**Table 4:** Effect estimative of studied haplotypes on adiponectin levels.

| | **Effect estimative (p value)** |
|---|---|
| **TGA** | - 0.40 (0.37) |
| **TTA** | + 0.75 (0.18) |
| **GGG** | + 0.47 (0.37) |
| **GGA** | - 1.90 (0.04) |

Models adjusted for age.

Effect estimative - change in mean adiponectin levels according to haplotypes groups.

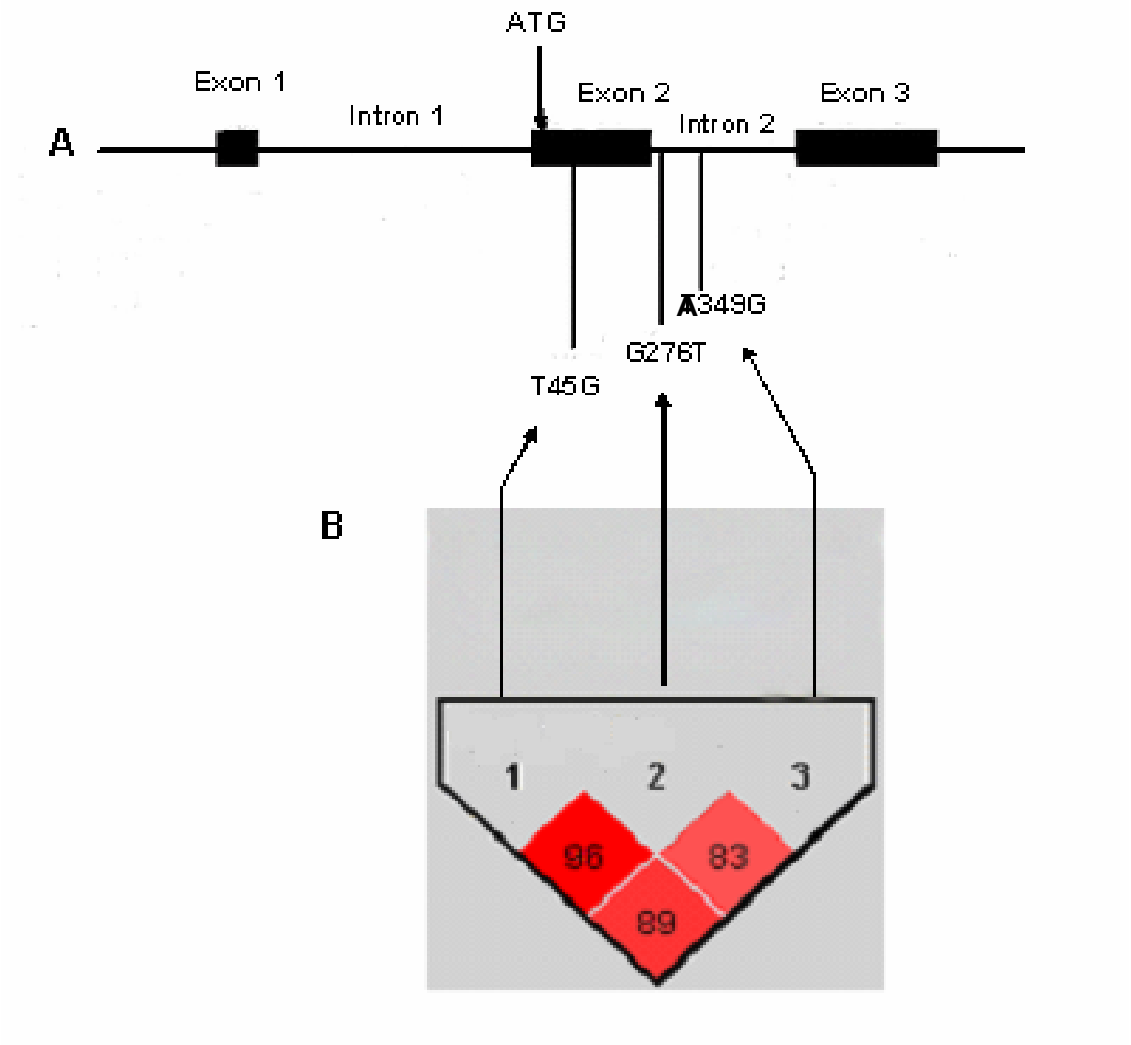


**Figure 1.** Schematic representation of *ADIPOQ* gene and linkage disequilibrium (LD) structure.

A.The exon-intron organization of the gene is indicated by boxes and lines, the positions of studied variants are showed.

B. Relative LD between SNP pairs is indicated by the scheme, based on the absolute values of the Lewontin normalized coefficient multiplied by 100, defining a sole haplotype block.

# A Novel Mutation in the Adiponectin (ADIPOQ) Gene is Associated with Hypoadiponectinemia in Japanese-Brazilians

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**Running title**: novel mutation in ADIPOQ gene and hypoadiponectinemia

**Key words**: adiponectin, ADIPOQ gene, Japanese-Brazilians

## *Abstract*

**Objective:** Adiponectin, an important mediator of insulin sensitivity, is encoded by the *ADIPOQ* gene. Here we describe two Japanese-Brazilian families with hypoadiponectinemia due to a novel mutation on *ADIPOQ* gene.

**Design and Patients**: In this study, we examined the entire translated regions of adiponectin in Japanese-Brazilians, a population with one of the highest prevalence rates of diabetes worldwide. We screened 200 patients with type 2 diabetes and 240 age-matched subjects with normal glucose tolerance.

**Results:** A novel heterozygous T deletion at position 186 in exon 2 of the *ADIPOQ* gene, causing a frameshift at codon 62 leading to a premature termination at codon 168 (*p.Gly63ValfsX106*) was found in two individuals with diabetes. This mutation was not found in 240 nondiabetic control subjects. In addition, we screened the mutation in an expanded set of 100 nondiabetic subjects from general Brazilian population, but we found no mutation. Six additional mutation carriers family members of probands were identified. Mutation-carrier individuals had markedly low plasma adiponectin concentrations compared with those without the mutation (DM: 1.01 $\pm$ 0.69 $\mu$g/ml vs 6.49 $\pm$ 5.04 $\mu$g/ml, $p< 0.001$; NGT: 1.10 $\pm$ 0.49 $\mu$g/ml vs 10.36 $\pm$ 6.63 $\mu$g/ml, $p= 0.003$). All individuals carrying the *p.Gly63ValfsX106* mutation and older than 30 years were found to be diabetic.

**Conclusions:** We describe for the first time a frameshift mutation in exon 2 of the *ADIPOQ* gene, which modulates adiponectin levels and may contribute to the genetic risk of late-onset diabetes in Japanese-Brazilians.

## Introduction

Adiponectin is an adipocyte-secreted protein that has been recognized as an important mediator of insulin sensitivity (1, 2). Thus, adiponectin may play a role in the pathogenesis of type 2 diabetes, obesity and atherosclerotic cardiovascular disease, conditions closely related to insulin resistance. In fact, several studies have reported low plasma adiponectin levels in patients with these diseases (3-5). It circulates as a multimeric high–order structures comprised of homotrimers that associates through disulphide bonds to form low molecular weight (LMW) hexamers (~180 kDa) and high molecular weight (HMW) multimers of > 300 kDa. Pajvani et al. showed that the ratio, and not the absolute amounts, between HMW to total adiponectin correlates better with measures of insulin sensitivity, suggesting that the HMW adiponectin complex is the active form of this protein (6).

Mutational screening of the *ADIPOQ,* the gene encoding adiponectin, was performed in different ethnic groups and an association of genetic variants with type 2 diabetes and insulin resistance was found (7-11).

Japanese-Brazilians show a high prevalence of glucose metabolism disturbances, being the prevalence rates of diabetes one of the highest worldwide (12). In this population we found that low plasma levels of adiponectin were an independent predictor over 7 years to glucose intolerance in a subset of subjects with normal glucose tolerance at baseline (13).

In the present study, we examined the entire translated regions of adiponectin gene in Japanese-Brazilians and a novel mutation associated with hypoadiponectinemia is reported.

### *Subjects and Methods*

**Subjects:** The mutation screening was carried out on genomic DNA from 200 randomly selected patients with diabetes mellitus (100 male and 100 female, aged 55.4 ± 10.7 years) and 240 age-matched control subjects with normal glucose tolerance (81 male and 159 female, aged 53.9 ± 13.0 years). All the individuals were recruited from the Japanese-Brazilian Diabetes Study Group, a survey designed to estimate the prevalence and incidence of diabetes and associated diseases in a Japanese-Brazilian population living in Bauru, São Paulo, Brazil. Details on the selection and recruitment of the sample population have been previously described (12). All individuals went through an interview with questionnaires about demographic, social aspects and medical history. Clinical examination was performed including anthropometric (weight, height and waist circumference) and blood pressure measurements. Fasting blood samples for glucose, insulin, lipids and adiponectin were obtained. A 75 g solution of anhydrous glucose was administered and two hours later another blood sample was obtained for glucose and insulin measurements. This study was approved by the Ethics Committe of Escola Paulista de Medicina, Universidade Federal de São Paulo, and all participants were informed about the aims of the study and gave their consent.

**Biochemical measurements:** Plasma glucose was determined by the glucose-oxidase method. Cholesterol contents of lipoproteins fractions and triglycerides were measured enzymatically. Insulin was determined by a monoclonal antibody-based immunofluorimetric assay (PerkinElmer, Wallac Oy, Turku, Finland). Insulin resistance was estimated by homeostasis model assessment (HOMA-IR) (14). Glucose tolerance status was based on 1999 WHO criteria (15). Fasting plasma

adiponectin concentrations were measured by radioimmunoassay (Linco Research, St Charles, MI, USA).

**Mutation screening:** Blood samples were obtained from each subject and genomic DNA was extracted from peripheral blood leukocytes using a commercial kit (Puregene DNA Isolation Kit, Gentra System, Minneapolis, MN, USA). The entire translated region of adiponectin gene was amplified by PCR using two pairs of specific primers: 5'AGAAAGCAGCTCCTAGAAGT3' and 5'GGCACCATCTACACTCATCC3' which flank the region containing exon 2, and 5'CCTAAGGGAGACATCGGTGA3' and 5'ATTGACTTTGGGGCTGTTTG3' which flank the region containing exon 3. The PCR products were directly sequenced on an ABI Prism 3100 Genetic Analyzer (Applied Biosystems, CA, USA). Sequence changes of frameshift mutation were determined by cloning the PCR product using the TOPO TA Cloning (Invitrogen, Carlsbad, CA, USA) and sequencing clones derived from both alleles. Numbering of nucleotides: +1 of ATG codon (GenBank: D45371.1) and amino acids according to GenBank accession number NP_004788.

**SDS-PAGE and immunobloting for determination of adiponectin oligomers:** SDS-PAGE was performed according to standard Laemmli procedure. Human serum diluted 10 fold was solubilized in 5x Sample buffer and loaded on a 3-12 % polyacrilamide gel under non-reducing, nonheated-denaturing conditions. Proteins were then electrophoretically transferred into a nitrocellulose membrane (Hybond ECL, Amersham Biosciences, USA). After blocking for 1 hour in 5% nonfat milk in TBS with 0,05% Tween 20, the blots were incubated with a human monoclonal antibody from BD Bioscience (1:5000 dilution with 1% nonfat milk in TTBS) for 2 h at room temperature. After washings, the membrane was incubated with

horseradish peroxidase-conjugated anti-rabbit antibody (1:5000 dilution) (Santa Cruz Biotechnology, USA) for 1 h at room temperature and then washed thoroughly. Bands were detected using ECL Western blotting detection reagent (Amersham Biosciences, USA) and quantified by densitometry analyses using the Scion Image software. Relative proportions of adiponectin oligomers were calculated by dividing band density by total density in each lane. This analysis was performed in all diabetic mutation-carrier individuals (n=5) and in five diabetic non mutation-carriers paired for age, gender and BMI.

**Microsatellite studies:** three polymorphic microsattelite near the transcriptional unit of adiponectin gene were genotyped in two individuals carrying the p.Gly63ValfsX106 mutation from different families.

**Statistical analysis.** All data are shown as mean ± SD. Differences in continuous variables among the groups with and without the mutation were evaluated by unpaired Student´s t test or Mann-Whitney, when appropriate. Differences in the frequencies of mutation between groups were tested by $\chi^2$ test. A p-value of < 0.05 was considered statistically significant.

## Results

The main characteristics of the study population are shown in Table 1. Patients with diabetes had significantly higher BMI, HOMA-IR, waist circumference and lower adiponectin levels than the normal glucose tolerant subjects. By direct sequencing of 2 exons of the *ADIPOQ* gene we identified a novel heterozygous T deletion at position 186 in exon 2, causing a frameshift at codon 62 leading to a premature termination at codon 168 (*c.186delT; p.Gly63ValfsX106*, according to Human Genome Variation Society nomenclature) in two individuals with diabetes.

This mutation was not found in the 240 age-matched nondiabetic control subjects. In addition, we screened the mutation in an expanded set of 100 nondiabetic subjects from general Brazilian population (32 male, 66 female, aged 48.9±14.4 years), but we found no mutation Available family members of probands with the p.Gly63ValfsX106 mutation were genotyped for this variant (n= 14) and 6 additional carriers were identified, three of them with diabetes (Figure 1).

The diabetic patients carrying the p.Gly63ValfsX106 mutation had markedly low plasma adiponectin concentration compared with those diabetic patients without the mutation (1.01 ± 0.69 μg/ml vs 6.49 ± 5.04 μg/ml, p< 0.001). Similarly, between the individuals with normal glucose tolerance, those carrying the mutation had a statistically significant lower plasma adiponectin concentrations than the non-carriers (1.10 ± 0.49 μg/ml vs 10.36 ± 6.63 μg/ml, p= 0.003). This difference was not only limited to the absolute amount of adiponectin but also the ratio of HMW to total adiponectin was decreased among diabetic subjects carrying the mutation when compared to age, gender, BMI paired diabetic subjects without the mutation (0.17±0.08 vs 0.32±0.06, respectively, p=0.018) (Figure 2). In order to examine if hypoadiponectinemia is a familial issue not related to the *p.Gly63ValfsX106* mutation, we compared adiponectin levels in mutation-carrier and non-mutation carrier individuals from F1 family. We found lower adiponectin levels in carriers than in non-carriers (0.85±0.41 ug/ml vs 5.15±2.3 ug/ml, p=0.009).

Among the *p.Gly63ValfsX106* carriers, we found that the diabetics were older (55.8+4.71 years vs 21.7+6.66 years, p=0.0001) and had higher waist circumference (89.0+7.24 cm vs 73.0+9.54 cm, p=0.035) than the normal glucose tolerant carriers. Also, the average age of diagnosis of diabetes was higher than

the chronological age of nondiabetic carriers (47.2+7.78 years vs 21.7+6.66 years, p=0.003) (Table 2).

Adiponectin levels showed a negative correlation with HOMA-IR (r=-0.255, p<0.0005) in the total Japanese-Brazilian study group. However, HOMA-IR values were not different in mutation-carriers compared to non-mutation carriers (Table 2).

Microsatellite studies showed different haplotypes for the three polymorphic markers in the two patients from F1 and F2 families, indicating that these two families have different genetic backgrounds. We, therefore, can infer that the mutations arose independently.

## Discussion

Here we report for the first time a frameshift mutation with a premature termination in the *ADIPOQ* gene associated with hypoadiponectinemia in two families of Japanese-Brazilians. These two families come from distinct regions of Japan (Hokkaido and Chugoku) and the haplotype analysis derived from three polymorphic microsatellites indicated that these families have different genetic backgrounds. Therefore, a common origin or founder effect is unlikely. The search for the *p.GlyValfsX106* mutation in other populations will reveal if it is restricted to the Japanese Brazilian population. This variant was not identified in 680 alleles of normal subjects, ruling out the possibility of polymorphism.

The *p.Gly63ValfsX106* mutation causes a frameshift at codon 62 leading to a premature termination at codon 168. As result, more than half of globular domain is missed. This mutation is located in the highly conserved collagen domain, which contains four lysines residues at positions 65, 68, 77 and 101 each having the

surrounding motif of GXKGE(D), that are also highly conserved between species. These four lysines were found to be hydroxylated and subsequently glycosylated. Wang et al. showed that in murine adiponectin the substitution of these four conserved lysines with arginine produced a variant with impaired ability to enhance insulin action in hepatocytes (16). Recently, Richards et al. (17) showed that in human adiponectin the conservatitve substitution of different combinations of these lysines has a more or less severe effect on the efficiency of HMW formation, demonstrating an important functional role of these lysine residues in the intracellular assembly and secretion of HMW multimers. Thus, the *p.Gly63ValfsX106* mutation, which leads to a substitution of two of these lysines and their surrounding motifs, may interferes with the post-translational modifications that regulate the multimer composition of adiponectin. In fact, when we assessed the multimer composition of adiponectin in serum by immunoblot and densitometric analysis we found a relative decrease of HMW forms in subjects carrying the mutation when compared to gender, age and BMI paired subjects without the mutation.

The gold standard for measuring insulin sensitivity is the hyperinsulinemic-euglycemic clamp technique, which is invasive, expensive and time-consuming to perform. Although not being the gold standard, HOMA-IR has been widely used as a tool to assess insulin sensitivity in clinical research and epidemiologic studies. In the present study we found a negative correlation between HOMA-IR and adiponectin levels in the total Japanese-Brazilian study group. However, despite of mutation-carriers being characterized by hypoadiponectinemia their HOMA-IR values were not different from non-mutation carriers. It should be pointed that since HOMA-IR is not a particularly precise measure of insulin, it is more suitable

for studies in large samples, such as the analyze in the total study group, than for assessment of individuals.

All individuals carrying the *p.Gly63ValfsX106* mutation and older than 30 years were found to be diabetic. The three normal glucose tolerant mutation-carriers individuals were younger (14, 25 and 26 years old) and may develop diabetes at later age. Based on the fact that in Japanese-Brazilians hypoadiponectinemia is an independent risk factor for the occurrence of glucose intolerance (13), these data suggests that heterozigosity for this mutation and the consequent hypoadiponectinemia may be a risk factor for late-onset diabetes.

Missense mutations in human adiponectin have been reported and some of them were associated with diabetes and hypoadiponectinemia (7, 8, 11). Investigating the mechanisms by which these mutations caused diabetes and hypoadiponectinemia, Waki et al found that mutants with impaired multimerization were associated with diabetes or hypoadiponectinemia while mutants without overtly abnormal phenotype showed normal multimerization (18). These data suggested impaired multimerization and/or consequent impaired secretion might be the causes of these phenotypes.

In conclusion, we describe for the first time a frameshift mutation in exon 2 of the *ADIPOQ* gene which modulates adiponectin levels and may contribute to the genetic risk of late-onset diabetes in Japanese-Brazilians.

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**Table 1:** Characteristics of study population by glucose tolerance status.

| | DM (n=200) | TGN (n=240) | *p* value |
|---|---|---|---|
| **Age (years)** | 55.4 ± 10.6 | 53.9 ± 13.0 | NS |
| **Sex (M/F)** | 100/100 | 81/159 | < 0.001 |
| **BMI (kg/m$^2$)** | 27.4 ± 3.7 | 23.1 ± 2.9 | < 0.001 |
| **HOMA-IR** | 4.91 ± 3.4 | 1.20 ± 0.5 | < 0.001 |
| **Waist circunf. (cm)** | 90.0 ± 11.3 | 78.2 ± 8.5 | < 0.001 |
| **Adiponectin (μg/ml)** | 6.44 ± 5.0 | 10.36 ± 6.6 | < 0.001 |

**Table 2:** Clinical and biochemical characteristics of type 2 diabetic patients and normal glucose tolerance subjects who bear the new mutation.

| Subject | | Age (years) | Sex (M/F) | BMI (kg/m²) | Age at onset of DM (years) | Waist circunference (cm) | HDL-c (mg/dl) | Triglycerides (mg/dl) | HOMA-IR | Adiponectin (μg/ml) |
|---|---|---|---|---|---|---|---|---|---|---|
| **DM wth muation** | **F1 II-1** | 63 | M | 26.0 | 49 | 100.0 | 44 | 351 | 2.65 | 0.65 |
| | **F1 II-4** | 56 | M | 22.9 | 55 | 85.0 | 75 | 759 | 1.25 | 0.60 |
| | **F1 II-9** | 50 | F | 20.7 | 34 | 81.0 | 49 | 212 | 3.13 | 0.55 |
| | **F2 II-1** | 56 | M | 23.9 | 50 | 87.5 | 39 | 182 | 6.87 | 2.20 |
| | **F2 II-2** | 54 | F | 28.2 | 48 | 91.5 | 44 | 186 | 8.10 | 1.05 |
| **DM without mutation (n=198)** | | 55.4 ± 10.7 | 98M 100F | 27.5 ± 3.7 | 53.6 ± 11.3 | 89.9 ± 9.6 | 49.0 ± 11.9 | 326 ± 279.6 | 4.91 ± 3.4 | 6.49 ± 5.0 |
| ***p* value** | | 0.93 | 0.99 | 0.06 | 0.21 | 0.85 | 0.83 | 0.77 | 0.74 | < 0.001 |
| **NGT with mutation** | **F1 III-1** | 26 | M | 26.3 | ----- | 84 | 53 | 70 | 1,06 | 1.65 |
| | **F1 III-2** | 25 | M | 20.6 | ----- | 67 | 51 | 60 | 0.82 | 0.7 |
| | **F1 III-5** | 14 | M | 22.3 | ----- | 68 | 37 | 74 | 1.27 | 0.95 |
| NGT without mutation (n=240) | | 53.9 ± 13.0 | 81M 159F | 23.0 ± 2.9 | ----- | 78.1 ± 8.5 | 50.8 ± 10.5 | 108.8 ± 127.9 | 1.17 ± 0.5 | 10.3 ± 6.6 |
| *p* value | | 0.003 | 0.07 | 0.99 | ----- | ----- | 0.62 | 0.007 | 0.72 | 0.03 |

**Figure legends:**

**Figure 1:** Pedigree of the families with *p.Gly63ValfsX106* mutation. The individuals with diabetes mellitus are represented with filled symbols, the subjects with normal glucose tolerance with empty symbols, and the subjects with impaired glucose tolerance with dashed symbols. Arrows indicate the probands. The text below each individual represents: age (years), BMI ($kg/m^2$), and serum adiponectin levels (μg/ml); M: mutant allele; N: wild-type allele; nd: not done.

**Figure 2:** Representative immunoblot illustrating the three multimer species of adiponectin from serum of diabetic patients mutation carrier (NM) and non-mutation carrier (NN). HMW: high molecular weight, MMW: medium molecular weight, LMW: low molecular weight

**Figure 1**

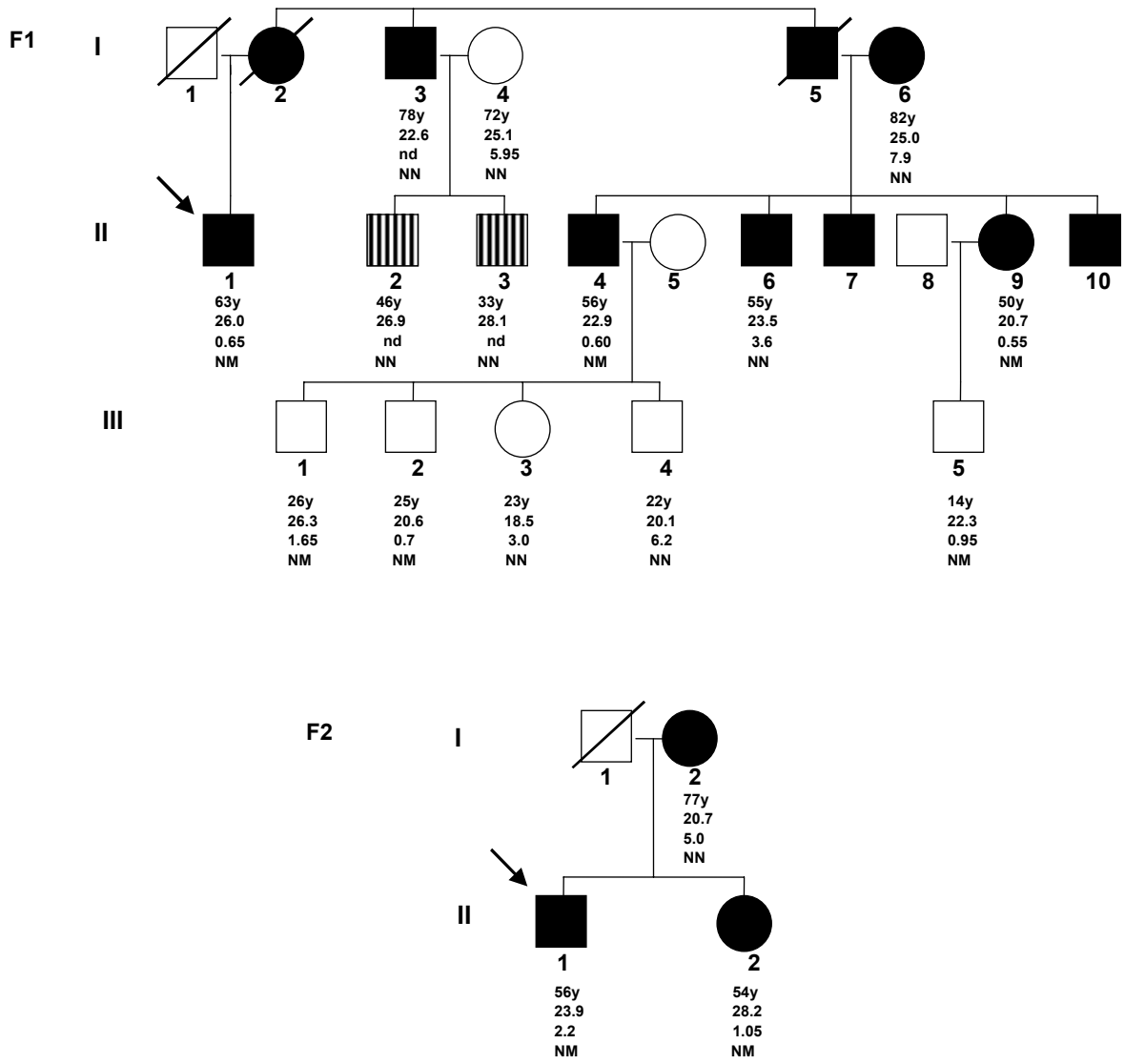
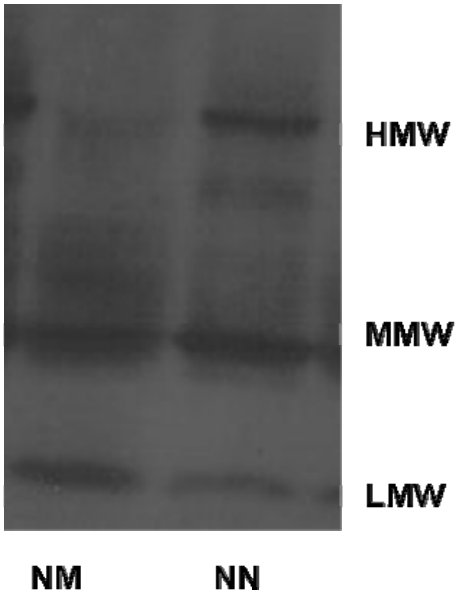

F1
I
1
2
3
78y
22.6
nd
NN
4
72y
25.1
5.95
NN
5
6
82y
25.0
7.9
NN
II
1
63y
26.0
0.65
NM
2
46y
26.9
nd
NN
3
33y
28.1
nd
NN
4
56y
22.9
0.60
NM
5
6
55y
23.5
3.6
NN
7
8
9
50y
20.7
0.55
NM
10
III
1
26y
26.3
1.65
NM
2
25y
20.6
0.7
NM
3
23y
18.5
3.0
NN
4
22y
20.1
6.2
NN
5
14y
22.3
0.95
NM
F2
I
1
2
77y
20.7
5.0
NN
II
1
56y
23.9
2.2
NM
2
54y
28.2
1.05
NM

**Figure 2**



# *CONSIDERAÇÕES FINAIS*

O tecido adiposo, além reservatório de energia, tem papel importante na regulação da homeostase energética, sensibilidade à insulina e metabolismo dos carboidratos e lipídios. Essas ações são mediadas através da secreção de vários peptídeos bioativos, referidos como adipocitoquinas.

Dentre as adipocitoquinas tem merecido destaque a adiponectina, que circula em concentrações relativamente altas no plasma, por suas importantes ações metabólicas e antiinflamatórias. Diferentes estudos mostram que os níveis circulantes de adiponectina são mais baixos em indivíduos obesos, portadores de Diabetes Mellitus (DM) tipo 2 e doença arterial coronariana, condições essas relacionadas à resistência à insulina. Portanto, níveis circulantes de adiponectina são índices de sensibilidade à insulina, porém ainda havia controvérsia se a adiponectinemia seria um simples marcador ou teria algum papel causal na sensibilidade à insulina. Estudos longitudinais em macacos mostraram que uma queda na adiponectinemia precede o desenvolvimento de resistência à insulina e DM tipo 2. Em humanos, estudos prospectivos avaliaram o papel do decréscimo nos níveis de adiponectina como preditor de DM ou síndrome metabólica. Ainda, estima-se que uma proporção substancial (30–70%) da variabilidade dos níveis plasmáticos de adiponectina seja regulada por fatores genéticos. Assim sendo, é possível que variantes no gene ADIPOQ possam modular os níveis plasmáticos de adiponectina, bem como o risco para o desenvolvimento de resistência à insulina e DM tipo 2.

Em nosso primeiro artigo, avaliamos a importância de baixos níveis de adiponectina como fator preditor para o desenvolvimento de intolerância à glicose na população nipo-brasileira, população essa caracterizada por alta prevalência de DM. Demonstramos que, em indivíduos com tolerância à glicose normal, níveis mais baixos de adiponectina estavam significantemente associados a um maior risco de desenvolvimento de intolerância à glicose em um período de sete anos de seguimento. Baixos níveis de adiponectina podem, portanto, ajudar a identificar entre indivíduos saudáveis aqueles com maior risco de desenvolvimento de intolerância à glicose, permitindo a instituição precoce de medidas preventivas.

No segundo artigo aqui apresentado, investigamos a contribuição das variantes comuns T45G, G276T e A349G no gene ADIPOQ para a ocorrência de DM na população nipo-brasileira. Examinamos também a freqüência e a significância clínica das mutações no *exon* 3 desse gene. Verificamos que o haplótipo GGA (45G + 276G + 349A) contribui para o risco genético do DM e é associado com níveis mais baixos de adiponectina. Além disso, detectamos a presença das mutações I164T, R221S e H241P, previamente descritas apenas na população japonesa, bastante raras na nossa população.

No terceiro artigo, ainda estudando o gene ADIPOQ, descrevemos pela primeira vez, em duas famílias nipo-brasileiras não relacionadas, uma mutação *frameshift* em heterozigose no *exon* 2, associada a níveis bastante reduzidos de adiponectina plasmática. A mutação *pGly63ValfsX106* leva a uma proteína truncada, com perda de parte significativa da porção globular, o que pode interferir na formação da adiponectina de alto peso molecular, considerada

biologicamente ativa. De fato, notamos um decréscimo relativo da forma de alto peso molecular entre os indivíduos carreadores da mutação, quando comparados a não carreadores pareados para sexo, idade e índice de massa corpórea. Portanto, verificamos que a modulação dos níveis de adiponectina e resultante maior suscetibilidade ao DM tipo 2 são causados tanto por variantes freqüentes quanto raras.

# CONCLUSÕES

Os dados obtidos no presente estudo nos permitem concluir que:

- Baixos níveis plasmáticos de adiponectina foram preditores independentes para o desenvolvimento intolerância à glicose em nipo-brasileiros em um período de seguimento de sete anos (Artigo 1).

- Identificamos no gene ADIPOQ um haplótipo de risco para o DM tipo 2, que afeta os níveis plasmáticos de adiponectina em nipo-brasileiros (Artigo 2).

- Descrevemos pela primeira vez uma mutação *frameshift* no *exon* 2 do gene ADIPOQ (*p.*Gly63ValfsX106), a qual modula os níveis de adiponectina e pode contribuir para o risco genético de DM tipo 2 em nipo-brasileiros (Artigo 3).

**Tabela 1:** Características demográficas, antropométricas e laboratoriais dos indivíduos com TGN no período basal (Artigo 1).

| Número | Iniciais | Sexo | Idade (anos) | Triglicérides (mg/dl) | HDL (mg/dl) | Cintura (cm) | IMC (kg/m²) | Adiponectina (µg/ml) |
|---|---|---|---|---|---|---|---|---|
| **1** | TM | M | 61 | 99 | 47 | 78,5 | 20,7 | 11,67 |
| **2** | HSY | F | 66 | 260 | 53 | 82,5 | 23,5 | 4,55 |
| **3** | NO | M | 63 | 110 | 42 | 101,8 | 29,3 | 6,14 |
| **4** | KH | F | 62 | 169 | 44 | 88,0 | 23,3 | 29,44 |
| **5** | MH | M | 68 | 141 | 43 | 83,0 | 23,6 | 5,4 |
| **6** | TY | M | 46 | 342 | 36 | 108,0 | 34 | 1,45 |
| **7** | AK | M | 56 | 96 | 39 | 87,0 | 26,6 | 4,65 |
| **8** | ES | F | 63 | 109 | 49 | 78,3 | 22,5 | 8,56 |
| **9** | ASK | M | 52 | 112 | 38 | 79,0 | 23,1 | 6,48 |
| **10** | BKK | M | 60 | 115 | 40 | 84,5 | 23,6 | 4,99 |
| **11** | HI | F | 72 | 91 | 57 | 81,0 | 23,5 | 8,59 |
| **12** | AAYA | F | 50 | 264 | 49 | 84,8 | 25,3 | 10,85 |
| **13** | FU | F | 56 | 287 | 30 | 102,0 | 29,7 | 6,59 |
| **14** | FH | M | 59 | 151 | 47 | 80,5 | 21,3 | 11,33 |
| **15** | MSY | F | 63 | 58 | 55 | 88,5 | 23,1 | 11,34 |
| **16** | FO | F | 57 | 282 | 26 | 93,8 | 25,1 | 9,9 |
| **17** | CHM | M | 41 | 292 | 38 | 99,0 | 27,3 | 5,75 |
| **18** | HN | F | 53 | 39 | 69 | 63,5 | 17,5 | 22,49 |
| **19** | AM | F | 53 | 210 | 44 | 91,8 | 29,1 | 5,24 |
| **20** | AST | M | 44 | 259 | 35 | 88,0 | 25,6 | 4,5 |
| **21** | AK | M | 47 | 181 | 53 | 92,0 | 27,3 | 2,42 |
| **22** | NNM | F | 52 | 42 | 47 | 84,8 | 28,2 | 12,91 |
| **23** | YH | M | 56 | 121 | 29 | 73,5 | 19,8 | 2,23 |
| **24** | KK | M | 50 | 333 | 22 | 88,0 | 24,2 | 13,95 |
| **25** | MMM | F | 41 | 181 | 35 | 76,5 | 24,2 | 12,84 |
| **26** | KM | F | 70 | 134 | 37 | 100,3 | 28,1 | 5,3 |
| **27** | HM | F | 58 | 46 | 75 | 61,8 | 16,5 | 28,8 |
| **28** | SU | M | 60 | 234 | 45 | 96,0 | 28,7 | 7,42 |
| **29** | KT | M | 59 | 105 | 40 | 88,0 | 27,3 | 4,87 |
| **30** | HN | F | 60 | 122 | 68 | 54,6 | 14,9 | 14,2 |

| Número | Iniciais | Sexo | Idade (anos) | Triglicérides (mg/dl) | HDL (mg/dl) | Cintura (cm) | IMC (kg/m²) | Adiponectina (µg/ml) |
|---|---|---|---|---|---|---|---|---|
| **31** | EF | M | 69 | 95 | 42 | 82,5 | 23,2 | 14,31 |
| **32** | M | 44 | 98 | 44 | 72,0 | 19,7 | 6 | M |
| **33** | M | 68 | 101 | 45 | 84,0 | 22,3 | 9,18 | M |
| **34** | M | 50 | 405 | 29 | 87,0 | 19,6 | 2,23 | M |
| **35** | F | 60 | 57 | 59 | 74,0 | 18,9 | 12,45 | F |
| **36** | M | 48 | 146 | 38 | 85,5 | 23,3 | 6,5 | M |
| **37** | M | 61 | 133 | 48 | 76,0 | 18,9 | 8,72 | M |
| **38** | F | 43 | 89 | 91 | 57,0 | 17,4 | 23,49 | F |
| **39** | M | 60 | 181 | 41 | 90,3 | 25,1 | 9,59 | M |
| **40** | F | 62 | 161 | 39 | 87,5 | 23,2 | 19,13 | F |
| **41** | F | 58 | 207 | 34 | 88,0 | 25,0 | 21,88 | F |
| **42** | M | 45 | 280 | 34 | 79,0 | 20,9 | 1,96 | M |
| **43** | M | 56 | 104 | 55 | 108,3 | 31,6 | 2,17 | M |
| **44** | M | 56 | 54 | 51 | 96,3 | 24,6 | 16,21 | M |
| **45** | F | 44 | 86 | 38 | 76,8 | 25,0 | 4,69 | F |
| **46** | F | 69 | 146 | 48 | 75,3 | 18,1 | 22,27 | F |
| **47** | F | 72 | 157 | 36 | 72,8 | 21,6 | 5,64 | F |
| **48** | F | 59 | 139 | 40 | 88,3 | 24,1 | 5,75 | F |
| **49** | M | 47 | 171 | 46 | 70,3 | 21,8 | 6,38 | M |
| **50** | F | 68 | 275 | 39 | 88,8 | 25,7 | 8,5 | F |
| **51** | M | 52 | 491 | 31 | 95,5 | 30,0 | 4,12 | M |
| **52** | F | 64 | 153 | 42 | 95,5 | 26,8 | 11,81 | F |
| **53** | M | 64 | 79 | 41 | 75,5 | 19,5 | 2,33 | M |
| **54** | M | 65 | 90 | 61 | 81,8 | 21,0 | 9,07 | M |
| **55** | F | 57 | 120 | 45 | 91,0 | 20,5 | 5,05 | F |
| **56** | M | 67 | 149 | 38 | 89,5 | 25,1 | 5,11 | M |
| **57** | F | 50 | 42 | 50 | 67,0 | 21,7 | 30,31 | F |
| **58** | F | 68 | 192 | 37 | 81,5 | 24,9 | 3,05 | F |
| **59** | M | 57 | 85 | 56 | 75,5 | 21,2 | 17,51 | M |
| **60** | M | 71 | 156 | 30 | 93,5 | 28,1 | 6,66 | M |

| Número | Iniciais | Sexo | Idade (anos) | Triglicérides (mg/dl) | HDL (mg/dl) | Cintura (cm) | IMC (kg/m²) | Adiponectina (µg/ml) |
|---|---|---|---|---|---|---|---|---|
| **61** | TT | M | 68 | 199 | 50 | 88,5 | 25,1 | 5,26 |
| **62** | KM | M | 55 | 142 | 63 | 72,5 | 20,8 | 8,05 |
| **63** | KOO | F | 47 | 40 | 63 | 86,0 | 23,1 | 14,2 |
| **64** | TT | F | 63 | 88 | 51 | 73,0 | 22,4 | 17,8 |
| **65** | NS | M | 54 | 872 | | 100,5 | 27,1 | 13,92 |
| **66** | IG | M | 54 | 168 | 32 | 85,5 | 23,9 | 4,36 |
| **67** | LU | M | 52 | 117 | 55 | 93,8 | 24,4 | 6,53 |
| **68** | KKT | F | 45 | 55 | 43 | 80,0 | 21,4 | 13,44 |
| **69** | LKO | M | 61 | 283 | 28 | 87,5 | 22,9 | 5,53 |
| **70** | IT | M | 56 | 89 | 38 | 89,3 | 27,1 | 5,3 |
| **71** | HB | F | 75 | 163 | 45 | 84,5 | 22,4 | 9,35 |
| **72** | KK | M | 50 | 128 | 31 | 111,5 | 35,5 | 3,91 |
| **73** | MI | F | 61 | 238 | 38 | 91,0 | 26,4 | 8,22 |
| **74** | HH | M | 42 | 350 | 33 | 81,5 | 33,1 | 4,29 |
| **75** | JO | F | 58 | 111 | 53 | 99,5 | 30,0 | 13,92 |
| **76** | SMK | F | 54 | 83 | 54 | 75,5 | 19,0 | 6,81 |
| **77** | NTM | M | 50 | 173 | 41 | 86,0 | 23,9 | 2,71 |
| **78** | NNM | F | 41 | 40 | 46 | 72,0 | 21,6 | 21,95 |
| **79** | MO | M | 62 | 129 | 60 | 82,8 | 23,2 | 4,09 |
| **80** | MK | F | 70 | 137 | 44 | 81,8 | 22,7 | 12,68 |
| **81** | KK | M | 53 | 132 | 44 | 94,5 | 26,7 | 1,5 |
| **82** | KMK | F | 60 | 132 | 44 | 97,5 | 28,8 | 9,78 |
| **83** | HK | M | 55 | 115 | 27 | 87,5 | 23,4 | 6,61 |
| **84** | KN | F | 75 | 221 | 60 | 94,5 | 23,1 | 17,11 |
| **85** | NID | F | 52 | 55 | 43 | 79,3 | 22,5 | 13,09 |
| **86** | AS | F | 71 | 236 | 34 | 89,8 | 24,4 | 8,88 |
| **87** | FS | F | 62 | 130 | 48 | 66,0 | 20,0 | 20,79 |
| **88** | MM | M | 46 | 357 | 13 | 75,8 | 20,5 | 12,45 |
| **89** | DM | F | 52 | 63 | 54 | 74,3 | 23,2 | 10,73 |
| **90** | MI | M | 77 | 76 | 28 | 84,0 | 22,0 | 1,71 |

| Número | Iniciais | Sexo | Idade (anos) | Triglicérides (mg/dl) | HDL (mg/dl) | Cintura (cm) | IMC (kg/m²) | Adiponectina (µg/ml) |
|---|---|---|---|---|---|---|---|---|
| **91** | MKI | F | 62 | 71 | 60 | 67,5 | 19,3 | 28,04 |
| **92** | MF | F | 69 | 104 | 56 | 66,0 | 19,1 | 12,05 |
| **93** | HT | F | 62 | 128 | 66 | 90,5 | 24,6 | 16,49 |
| **94** | MSO | F | 41 | 153 | 40 | 89,0 | 24,9 | 5,61 |
| **95** | MT | M | 53 | 237 | 28 | 93,0 | 26,8 | 5 |
| **96** | KY | F | 64 | 151 | 37 | 91,3 | 30,2 | 6,35 |
| **97** | NYM | M | 43 | 82 | 42 | 92,3 | 23,8 | 6,24 |
| **98** | MY | F | 63 | 112 | 56 | 67,0 | 19,4 | 2,9 |
| **99** | SK | F | 44 | 49 | 54 | 89,8 | 28,4 | 16,9 |
| **100** | OO | M | 51 | 50 | 48 | 86,0 | 23,2 | 6,91 |
| **101** | MK | F | 71 | 153 | 40 | 82,5 | 24,0 | 11,12 |
| **102** | KT | M | 41 | 895 | ---- | 81,8 | 25,5 | 9,26 |
| **103** | KK | F | 37 | 67 | 59 | 73,3 | 22,1 | 5,4 |
| **104** | HK | M | 41 | 131 | 39 | 96,5 | 31,9 | 5,25 |
| **105** | AYT | M | 43 | 125 | 29 | 86,0 | 25,6 | 16,5 |
| **106** | NK | F | 60 | 128 | 44 | 70,6 | 21,0 | 10,9 |
| **107** | YN | F | 41 | 79 | 24 | 82,5 | 23,6 | 4,88 |
| **108** | MKK | F | 44 | 134 | 43 | 73,5 | 19,1 | 3,15 |
| **109** | NMS | F | 48 | 158 | 27 | 80,5 | 24,5 | 3,03 |
| **110** | AS | F | 63 | 111 | 43 | 83,3 | 23,8 | 9,97 |
| **111** | TK | M | 71 | 133 | 33 | 79,0 | 20,2 | 3,1 |
| **112** | RI | M | 67 | 98 | 29 | 74,0 | 19,1 | 11,25 |
| **113** | JKT | M | 47 | 217 | 36 | 86,3 | 21,1 | 5,15 |
| **114** | MI | M | 63 | 132 | 40 | 81,3 | 21,1 | 4,46 |
| **115** | TK | F | 57 | 119 | 53 | 90,8 | 25,4 | 9,82 |
| **116** | KAI | F | 60 | 102 | 59 | 75,0 | 19,8 | 9,55 |
| **117** | TTM | F | 55 | 119 | 31 | 81,5 | 24,0 | 2,77 |
| **118** | YM | M | 57 | 106 | 59 | 88,8 | 22,8 | 6,68 |
| **119** | RFY | F | 47 | 66 | 40 | 65,5 | 24 | 2,4 |
| **120** | KS | F | 50 | ---- | ---- | 81,0 | 24,1 | 1,77 |

| Número | Iniciais | Sexo | Idade (anos) | Triglicérides (mg/dl) | HDL (mg/dl) | Cintura (cm) | IMC (kg/m²) | Adiponectina (µg/ml) |
|---|---|---|---|---|---|---|---|---|
| **121** | TM | F | 60 | 139 | 54 | 117,0 | 30,9 | 7,19 |
| **122** | ES | M | 53 | 153 | 34 | 85,3 | 24,6 | 8,02 |
| **123** | PMS | M | 41 | 154 | 48 | 75,8 | 27,8 | 12,28 |
| **124** | SM | M | 71 | 284 | 28 | 79,8 | 21,8 | 2,3 |
| **125** | MTH | F | 45 | 41 | 37 | 75,0 | 23,6 | 16,85 |
| **126** | MM | F | 65 | 116 | 46 | 109,8 | 30,3 | 3,52 |
| **127** | TT | M | 60 | 176 | 42 | 100,8 | 31,3 | 15,65 |
| **128** | SKT | F | 65 | 434 | 26 | 80,5 | 22,7 | 4,7 |
| **129** | TT | M | 55 | 129 | 35 | 101,8 | 30,8 | 8,75 |
| **130** | SM | M | 42 | 110 | 35 | 92,0 | 27 | 6 |
| **131** | TT | M | 46 | 123 | 34 | 86,8 | 24,6 | 4,33 |
| **132** | YM | M | 55 | 214 | 38 | 97,0 | 30,7 | 8,05 |
| **133** | SKM | M | 52 | 83 | 43 | 82,0 | 25,1 | 1,55 |
| **134** | OM | M | 46 | 129 | 36 | 102,3 | 33,2 | 15,14 |
| **135** | SKT | F | 41 | 110 | 38 | 60,0 | 17,8 | 25,17 |
| **136** | SH | F | 61 | 120 | 49 | 59,0 | 17,8 | 6,91 |
| **137** | TI | M | 45 | 103 | 37 | 82,0 | 23,3 | 7,12 |
| **138** | TK | F | 69 | 139 | 39 | 90,0 | 22,9 | 3,17 |
| **139** | MK | M | 76 | 59 | 57 | 76,4 | 18,6 | 27,52 |
| **140** | TSK | M | 40 | 71 | 29 | 87,3 | 25,1 | 13,25 |
| **141** | YM | F | 74 | 159 | 50 | 91,0 | 27,5 | 16,49 |
| **142** | JS | M | 41 | 137 | 29 | 89,0 | 23,2 | 1,4 |
| **143** | SEH | F | 45 | 68 | 56 | 83,3 | 25,2 | 9,03 |
| **144** | NTN | F | 46 | 147 | 51 | 96,3 | 29,5 | 5,95 |
| **145** | LS | F | 43 | 71 | 48 | 73,5 | 20,2 | 25,14 |
| **146** | MSY | M | 56 | 49 | 54 | 71,5 | 17,4 | 11,33 |
| **147** | FM | F | 50 | 307 | 37 | 90,8 | 27,4 | 1,8 |
| **148** | IM | M | 57 | 67 | 41 | 86,8 | 25,3 | 3,36 |
| **149** | YNM | F | 61 | 215 | 49 | 87,5 | 22,0 | 8,91 |
| **150** | SY | F | 73 | 144 | 43 | 91,5 | 27,5 | 4,65 |

| Número | Iniciais | Sexo | Idade (anos) | Triglicérides (mg/dl) | HDL (mg/dl) | Cintura (cm) | IMC (kg/m²) | Adiponectina (µg/ml) |
|---|---|---|---|---|---|---|---|---|
| **151** | YM | F | 76 | 85 | 53 | 83,0 | 21,6 | 11,1 |
| **152** | NYM | F | 44 | 51 | 46 | 75,3 | 25,2 | 6,3 |
| **153** | TT | F | 50 | 74 | 74 | 73,3 | 21,1 | 12,05 |
| **154** | TK | F | 84 | 93 | 39 | 79,0 | 23,3 | 7,87 |
| **155** | TK | M | 41 | 140 | 37 | 94,5 | 27,4 | 9,33 |
| **156** | TN | F | 67 | 314 | 38 | 81,0 | 25,6 | 6,65 |
| **157** | LT | F | 60 | 132 | 48 | 81,5 | 22,7 | 11,2 |
| **158** | HN | F | 68 | 138 | 49 | 91,0 | 29,1 | 18,88 |
| **159** | CK | M | 61 | 104 | 33 | 83,5 | 22,5 | 4,15 |
| **160** | TSK | F | 62 | 123 | 63 | 80,8 | 24,0 | 13,4 |
| **161** | EH | M | 44 | 178 | 40 | 85,0 | 22,0 | 2,4 |
| **162** | YT | F | 45 | 162 | 52 | 88,0 | 23,0 | 4,25 |
| **163** | JHKC | F | 41 | 167 | 41 | 83,0 | 25,0 | 6,59 |
| **164** | AM | F | 67 | 204 | 35 | 98,0 | 29,2 | 6 |
| **165** | SK | M | 64 | 58 | 65 | 74,0 | 20,2 | 9,87 |
| **166** | KK | F | 69 | 127 | 46 | 80,8 | 24,9 | 9,79 |
| **167** | KT | M | 60 | 155 | 40 | 96,5 | 27,6 | 12,76 |
| **168** | ST | M | 44 | 131 | 51 | 99,8 | 30,2 | 5,25 |
| **169** | YO | F | 64 | 181 | 33 | 94,5 | 26,2 | 3,19 |
| **170** | RFY | M | 68 | 136 | 44 | 89,0 | 24,0 | 7,25 |
| **171** | KMS | F | 40 | 66 | 65 | 74,8 | 23,8 | 6,85 |
| **172** | TM | M | 46 | 64 | 38 | 82,8 | 25,3 | 11,67 |
| **173** | ST | F | 64 | 145 | 41 | 100,8 | 29,2 | 4,4 |
| **174** | TN | M | 65 | 215 | 39 | 88,8 | 24,2 | 3,05 |
| **175** | SEH | F | 57 | 268 | 35 | 88,5 | 27,7 | 7,91 |
| **176** | TS | M | 50 | 154 | 33 | 84,5 | 24,8 | 5,35 |
| **177** | TTH | F | 40 | 76 | 39 | 76,8 | 22,9 | 6,33 |
| **178** | OO | M | 47 | 206 | 30 | 81,5 | 22,3 | 4,42 |
| **179** | MAO | F | 56 | 128 | 39 | 74,5 | 22,9 | 6,65 |
| **180** | JTT | M | 59 | 166 | 19 | 93,5 | 27,1 | 3,35 |

| Número | Iniciais | Sexo | Idade (anos) | Triglicérides (mg/dl) | HDL (mg/dl) | Cintura (cm) | IMC (kg/m²) | Adiponectina (µg/ml) |
|---|---|---|---|---|---|---|---|---|
| **181** | SKT | F | 76 | 88 | 58 | 75,5 | 19,3 | 11,8 |
| **182** | PZ | M | 44 | 178 | 41 | 79,8 | 25,2 | 3,99 |
| **183** | KM | M | 58 | 209 | 30 | 89,3 | 29,4 | 2,51 |
| **184** | TK | M | 47 | 176 | 38 | 92,5 | 26,0 | 4,35 |
| **185** | OSIK | F | 43 | 182 | 38 | 85,3 | 27,8 | 6,7 |
| **186** | FMA | F | 55 | 106 | 50 | 89,3 | 26,0 | 4,85 |
| **187** | ST | M | 67 | 90 | 33 | 74,8 | 19,3 | 14,8 |
| **188** | TT | F | 60 | 92 | 31 | 84,0 | 27,2 | 3,35 |
| **189** | TS | M | 73 | 355 | 41 | 85,8 | 22,4 | 6,65 |
| **190** | YN | F | 76 | 139 | 61 | 77,3 | 19,5 | 20 |
| **191** | THT | F | 74 | 255 | 36 | 66,3 | 19,1 | 9,28 |
| **192** | NT | F | 75 | 81 | 48 | 87,8 | 25,7 | 13 |
| **193** | MKM | F | 54 | 77 | 53 | 81,8 | 23,5 | 11,38 |
| **194** | MAI | F | 46 | 124 | 41 | 93,1 | 29,8 | 9,73 |
| **195** | MMT | F | 56 | 92 | 35 | 95,3 | 27,9 | 12,74 |
| **196** | YUS | F | 46 | 128 | 59 | 72,0 | 21,8 | 37,5 |
| **197** | MN | M | 50 | 83 | 50 | 88,3 | 25,8 | 4,28 |
| **198** | KK | F | 61 | 122 | 46 | 74,8 | 19,9 | 4,68 |
| **199** | HSU | F | 47 | 170 | 51 | 93,5 | 31,7 | 24,35 |
| **200** | YNU | F | 70 | 157 | 42 | 102,5 | 32,4 | 9,45 |
| **201** | YM | F | 63 | 277 | 60 | 91,0 | 30,6 | 1,9 |
| **202** | MM | M | 45 | 985 | - | 88,0 | 26,7 | 3,83 |
| **203** | KN | M | 64 | 112 | 47 | 82,8 | 22,9 | 4,51 |
| **204** | MK | M | 70 | 161 | 34 | 90,8 | 24,7 | 4,08 |
| **205** | TFG | F | 41 | 130 | 39 | 89,5 | 29,6 | 3,36 |
| **206** | TFG | F | 55 | 123 | 36 | 77,8 | 23,3 | 9,9 |
| **207** | HOA | F | 59 | 128 | 34 | 87,3 | 26,3 | 2,44 |
| **208** | MM | M | 59 | 222 | 41 | 81,8 | 22,8 | 14,25 |
| **209** | KJ | M | 52 | 634 | 35 | 95,5 | 26,0 | 0,85 |
| **210** | YO | F | 64 | 94 | 42 | 65,0 | 19,0 | 13,1 |

**Tabela 2:** Características demográficas, antropométricas e tolerância à glicose dos indivíduos ao final do período de seguimento (Artigo 1).

| Número | Iniciais | Sexo | Idade (anos) | IMC (kg/m²) | Cintura (cm) | Tolerância à glicose |
|---|---|---|---|---|---|---|
| **1** | TM | M | 67 | 21,6 | 85,15 | TGN |
| **2** | HSY | F | 71 | 22,6 | 94,10 | TGD |
| **3** | NO | M | 69 | 26,1 | 98,50 | TGN |
| **4** | KH | F | 68 | 23,3 | 83,50 | TGN |
| **5** | MH | M | 74 | 24,5 | 85,50 | TGN |
| **6** | TY | M | 52 | 34,1 | 101,50 | TGD |
| **7** | AK | M | 61 | 26,1 | 85,75 | GJA |
| **8** | ES | F | 68 | 23,6 | 89,20 | DM |
| **9** | ASK | M | 58 | 25,1 | 88,75 | TGD |
| **10** | BKK | M | 66 | 23,3 | 86,25 | TGD |
| **11** | HI | F | 77 | 22,5 | 79,00 | TGN |
| **12** | AAYA | F | 56 | 25,0 | 83,50 | TGD |
| **13** | FU | F | 62 | 29,0 | 96,75 | GJA |
| **14** | FH | M | 65 | 22,3 | 82,50 | TGD |
| **15** | MSY | F | 69 | 22,8 | 78,50 | TGN |
| **16** | FO | F | 63 | 24,3 | 92,50 | TGN |
| **17** | CHM | M | 47 | 23,4 | 93,25 | GJA |
| **18** | HN | F | 59 | 18,8 | 70,50 | GJA |
| **19** | AM | F | 59 | 30,0 | 93,50 | DM |
| **20** | AST | M | 50 | 28,0 | 92,00 | DM |
| **21** | AK | M | 53 | 27,5 | 91,25 | TGD |
| **22** | NNM | F | 57 | 24,9 | 78,50 | DM |
| **23** | YH | M | 62 | 20,1 | 72,00 | TGD |
| **24** | KK | M | 56 | 23,4 | 85,00 | GJA |
| **25** | MMM | F | 47 | 24,3 | 75,50 | DM |
| **26** | KM | F | 76 | 28,5 | 93,00 | TGD |
| **27** | HM | F | 63 | 17,4 | 70,75 | TGN |
| **28** | SU | M | 66 | 31,1 | 101,75 | DM |
| **29** | KT | M | 65 | 28,2 | 93,00 | TGD |
| **30** | HN | F | 66 | 17,3 | 73,50 | GJA |

| Número | Iniciais | Sexo | Idade (anos) | IMC (kg/m²) | Cintura (cm) | Tolerância à glicose |
|---|---|---|---|---|---|---|
| **31** | EF | M | 74 | 21,8 | 77,00 | GJA |
| **32** | YY | M | 50 | 22,7 | 75,25 | TGD |
| **33** | SM | M | 74 | 22,7 | 61,50 | TGD |
| **34** | JTT | M | 56 | 19,6 | 79,50 | GJA |
| **35** | YO | F | 66 | 22,4 | 79,50 | TGN |
| **36** | HH | M | 54 | 25,0 | 92,50 | TGD |
| **37** | IO | M | 67 | 18,5 | 75,50 | DM |
| **38** | HYA | F | 49 | 17,1 | 53,50 | TGN |
| **39** | NH | M | 66 | 28,1 | 93,50 | TGN |
| **40** | MH | F | 68 | 23,1 | 81,10 | TGN |
| **41** | EA | F | 64 | 25,2 | 80,00 | DM |
| **42** | SO | M | 51 | 23,0 | 86,50 | TGN |
| **43** | JU | M | 62 | 31,5 | 117,50 | GJA |
| **44** | NTN | M | 68 | 24,6 | 84,20 | TGD |
| **45** | SNM | F | 49 | 26,8 | 80,50 | TGN |
| **46** | MM | F | 74 | 18,0 | 61,00 | TGN |
| **47** | KK | F | 77 | 21,3 | 72,50 | TGD |
| **48** | KOY | F | 65 | 25,8 | 87,00 | TGN |
| **49** | JKT | M | 52 | 21,8 | 72,75 | DM |
| **50** | HY | F | 74 | 26,9 | 89,50 | DM |
| **51** | AI | M | 58 | 28,3 | 97,50 | DM |
| **52** | MGK | F | 70 | 29,9 | 85,50 | GJA |
| **53** | KY | M | 72 | 20,9 | 80,00 | TGD |
| **54** | MK | M | 71 | 20,0 | 75,00 | TGD |
| **55** | WK | F | 63 | 19,9 | 74,00 | GJA |
| **56** | YS | M | 73 | 25,7 | 88,50 | TGD |
| **57** | LYAI | F | 56 | 21,6 | 66,00 | TGN |
| **58** | KK | F | 75 | 27,1 | 83,25 | TGN |
| **59** | HOA | M | 63 | 21,0 | 77,50 | TGN |
| **60** | KK | M | 77 | 28,1 | 96,00 | TGD |

| Número | Iniciais | Sexo | Idade (anos) | IMC (kg/m²) | Cintura (cm) | Tolerância à glicose |
|---|---|---|---|---|---|---|
| **61** | TT | M | 75 | 23,6 | 84,50 | DM |
| **62** | KM | M | 61 | 20,8 | 72,00 | DM |
| **63** | KOO | F | 53 | 24,5 | 75,00 | TGD |
| **64** | TT | F | 69 | 21,5 | 68,50 | GJA |
| **65** | NS | M | 61 | 28,8 | 100,00 | DM |
| **66** | IG | M | 60 | 26,9 | 90,50 | DM |
| **67** | LU | M | 58 | 25,2 | 88,00 | DM |
| **68** | KKT | F | 51 | 21,9 | 74,50 | TGN |
| **69** | LKO | M | 67 | 25,8 | 86,50 | TGN |
| **70** | IT | M | 63 | 24,4 | 86,00 | GJA |
| **71** | HB | F | 81 | 23,3 | 80,00 | TGD |
| **72** | KK | M | 55 | 35,4 | 108,50 | DM |
| **73** | MI | F | 67 | 26,3 | 83,00 | TGD |
| **74** | HH | M | 49 | 25,7 | 84,00 | TGD |
| **75** | JO | F | 64 | 32,2 | 91,00 | DM |
| **76** | SMK | F | 61 | 19,0 | 64,50 | GJA |
| **77** | NTM | M | 56 | 24,3 | 81,00 | TGD |
| **78** | NNM | F | 47 | 22,6 | 72,00 | TGN |
| **79** | MO | M | 66 | 24,9 | 86,00 | TGD |
| **80** | MK | F | 76 | 21,7 | 77,50 | TGD |
| **81** | KK | M | 59 | 27,8 | 90,50 | DM |
| **82** | KMK | F | 66 | 28,1 | 90,00 | DM |
| **83** | HK | M | 61 | 24,1 | 83,00 | DM |
| **84** | KN | F | 82 | 22,9 | 85,00 | GJA |
| **85** | NID | F | 59 | 24,6 | 74,50 | TGN |
| **86** | AS | F | 77 | 25,8 | 82,00 | DM |
| **87** | FS | F | 68 | 20,4 | 64,00 | TGN |
| **88** | MM | M | 52 | 20,1 | 73,00 | GJA |
| **89** | DM | F | 58 | 23,3 | 70,50 | TGN |
| **90** | MI | M | 82 | 21,6 | 79,00 | GJA |

| Número | Iniciais | Sexo | Idade (anos) | IMC (kg/m²) | Cintura (cm) | Tolerância à glicose |
|---|---|---|---|---|---|---|
| **91** | MKI | F | 68 | 18,5 | 65,00 | TGN |
| **92** | MF | F | 75 | 19,2 | 67,00 | TGN |
| **93** | HT | F | 68 | 26,3 | 82,50 | GJA |
| **94** | MSO | F | 47 | 24,7 | 80,00 | GJA |
| **95** | MT | M | 59 | 26,8 | 97,00 | TGD |
| **96** | KY | F | 70 | 29,5 | 94,00 | TGD |
| **97** | NYM | M | 49 | 22,6 | 84,00 | GJA |
| **98** | MY | F | 69 | 22,0 | 71,50 | TGD |
| **99** | SK | F | 50 | 31,8 | 89,00 | DM |
| **100** | OO | M | 58 | 23,2 | 84,00 | DM |
| **101** | MK | F | 77 | 23,5 | 73,50 | TGN |
| **102** | KT | M | 47 | 23,3 | 81,00 | TGN |
| **103** | KK | F | 43 | 21,9 | 66,00 | TGD |
| **104** | HK | M | 46 | 38,4 | 108,00 | DM |
| **105** | AYT | M | 49 | 26,7 | 85,50 | TGD |
| **106** | NK | F | 66 | 19,7 | 66,50 | TGD |
| **107** | YN | F | 47 | 25,7 | 82,00 | DM |
| **108** | MKK | F | 50 | 19,1 | 65,00 | GJA |
| **109** | NMS | F | 55 | 24,5 | 77,00 | DM |
| **110** | AS | F | 69 | 24,6 | 77,50 | DM |
| **111** | TK | M | 76 | 20,1 | 74,50 | GJA |
| **112** | RI | M | 74 | 18,4 | 71,00 | TGD |
| **113** | JKT | M | 53 | 21,2 | 82,00 | TGD |
| **114** | MI | M | 70 | 21,4 | 80,00 | DM |
| **115** | TK | F | 64 | 26,8 | 85,00 | TGD |
| **116** | KAI | F | 67 | 20,6 | 69,00 | GJA |
| **117** | TTM | F | 61 | 27,2 | 86,50 | DM |
| **118** | YM | M | 64 | 23,7 | 90,00 | TGD |
| **119** | RFY | F | 52 | 22,8 | 71,00 | TGD |
| **120** | KS | F | 57 | 24,0 | 81,00 | DM |

| Número | Iniciais | Sexo | Idade (anos) | IMC (kg/m²) | Cintura (cm) | Tolerância à glicose |
|---|---|---|---|---|---|---|
| **121** | TM | F | 66 | 31,4 | 97,00 | TGN |
| **122** | ES | M | 59 | 24,2 | 82,00 | TGD |
| **123** | PMS | M | 47 | 22,7 | 79,50 | TGN |
| **124** | SM | M | 78 | 20,0 | 73,50 | GJA |
| **125** | MTH | F | 51 | 23,3 | 73,00 | GJA |
| **126** | MM | F | 72 | 29,8 | 97,50 | DM |
| **127** | TT | M | 67 | 34,5 | 108,00 | TGD |
| **128** | SKT | F | 71 | 23,9 | 79,50 | TGD |
| **129** | TT | M | 61 | 31,0 | 104,00 | DM |
| **130** | SM | M | 48 | 34,6 | 103,50 | GJA |
| **131** | TT | M | 52 | 25,8 | 89,00 | DM |
| **132** | YM | M | 62 | 30,2 | 101,00 | DM |
| **133** | SKM | M | 58 | 23,3 | 76,50 | GJA |
| **134** | OM | M | 52 | 33,2 | 102,00 | DM |
| **135** | SKT | F | 50 | 17,9 | 60,00 | TGN |
| **136** | SH | F | 67 | 18,8 | 64,50 | TGN |
| **137** | TI | M | 51 | 23,4 | 77,50 | TGD |
| **138** | TK | F | 75 | 24,1 | 76,00 | TGN |
| **139** | MK | M | 83 | 18,7 | 72,00 | TGD |
| **140** | TSK | M | 46 | 29,0 | 99,00 | TGD |
| **141** | YM | F | 80 | 26,4 | 85,00 | TGD |
| **142** | JS | M | 49 | 23,2 | 81,00 | TGD |
| **143** | SEH | F | 52 | 26,1 | 80,50 | TGD |
| **144** | NTN | F | 53 | 29,4 | 92,00 | DM |
| **145** | LS | F | 49 | 18,8 | 66,50 | TGD |
| **146** | MSY | M | 62 | 16,7 | 70,00 | GJA |
| **147** | FM | F | 56 | 28,2 | 85,00 | TGD |
| **148** | IM | M | 63 | 25,8 | 86,00 | TGD |
| **149** | YNM | F | 66 | 20,4 | 71,00 | TGN |
| **150** | SY | F | 79 | 22,4 | 83,00 | TGD |

| Número | Iniciais | Sexo | Idade (anos) | IMC (kg/m²) | Cintura (cm) | Tolerância à glicose |
|---|---|---|---|---|---|---|
| **151** | YM | F | 82 | 24,6 | 84,00 | TGN |
| **152** | NYM | F | 51 | 26,9 | 80,00 | TGD |
| **153** | TT | F | 56 | 22,1 | 77,00 | TGN |
| **154** | TK | F | 81 | 22,0 | 71,50 | TGN |
| **155** | TK | M | 48 | 28,6 | 94,50 | DM |
| **156** | TN | F | 74 | 25,9 | 80,00 | TGD |
| **157** | LT | F | 67 | 23,0 | 84,00 | TGD |
| **158** | HN | F | 74 | 27,4 | 85,00 | TGN |
| **159** | CK | M | 67 | 22,3 | 88,00 | TGD |
| **160** | TSK | F | 68 | 24,6 | 78,00 | DM |
| **161** | EH | M | 51 | 22,3 | 83,50 | TGD |
| **162** | YT | F | 52 | 23,1 | 72,00 | GJA |
| **163** | JHKC | F | 47 | 24,9 | 75,00 | TGN |
| **164** | AM | F | 74 | 28,5 | 89,75 | TGD |
| **165** | SK | M | 71 | 20,5 | 70,75 | TGN |
| **166** | KK | F | 75 | 23,6 | 74,00 | TGN |
| **167** | KT | M | 66 | 27,3 | 97,00 | GJA |
| **168** | ST | M | 50 | 32,0 | 103,00 | TGD |
| **169** | YO | F | 71 | 26,5 | 83,00 | TGN |
| **170** | RFY | M | 75 | 21,7 | 78,00 | GJA |
| **171** | KMS | F | 47 | 25,9 | 80,00 | TGD |
| **172** | TM | M | 53 | 26,2 | 85,00 | TGN |
| **173** | ST | F | 71 | 30,4 | 97,00 | TGD |
| **174** | TN | M | 72 | 25,5 | 90,00 | TGD |
| **175** | SEH | F | 53 | 27,9 | 86,00 | DM |
| **176** | TS | M | 56 | 25,0 | 87,00 | GJA |
| **177** | TTH | F | 46 | 25,5 | 81,00 | TGN |
| **178** | OO | M | 53 | 21,6 | 79,00 | GJA |
| **179** | MAO | F | 62 | 23,2 | 77,00 | GJA |
| **180** | JTT | M | 66 | 29,1 | 100,00 | TGD |

| Número | Iniciais | Sexo | Idade (anos) | IMC (kg/m²) | Cintura (cm) | Tolerância à glicose |
|---|---|---|---|---|---|---|
| **181** | SKT | F | 83 | 19,4 | 69,00 | GJA |
| **182** | PZ | M | 51 | 26,2 | 85,00 | TGD |
| **183** | KM | M | 64 | 26,4 | 92,00 | DM |
| **184** | TK | M | 53 | 25,8 | 91,00 | TGD |
| **185** | OSIK | F | 49 | 28,5 | 89,00 | TGN |
| **186** | FMA | F | 61 | 26,2 | 84,50 | TGD |
| **187** | ST | M | 73 | 20,8 | 85,00 | GJA |
| **188** | TT | F | 66 | 27,4 | 88,00 | TGD |
| **189** | TS | M | 80 | 21,2 | 81,15 | TGD |
| **190** | YN | F | 83 | 20,9 | 83,00 | TGN |
| **191** | THT | F | 81 | 19,5 | 76,00 | GJA |
| **192** | NT | F | 82 | 23,6 | 78,00 | GJA |
| **193** | MKM | F | 60 | 24,0 | 77,00 | TGN |
| **194** | MAI | F | 52 | 29,6 | 94,00 | GJA |
| **195** | MMT | F | 63 | 29,2 | 96,00 | DM |
| **196** | YUS | F | 53 | 22,3 | 74,00 | GJA |
| **197** | MN | M | 57 | 24,3 | 81,00 | DM |
| **198** | KK | F | 68 | 18,0 | 71,00 | GJA |
| **199** | HSU | F | 53 | 34,0 | 98,00 | TGD |
| **200** | YNU | F | 77 | 33,1 | 97,00 | TGD |
| **201** | YM | F | 70 | 32,2 | 95,00 | TGD |
| **202** | MM | M | 51 | 27,8 | 95,00 | TGN |
| **203** | KN | M | 71 | 23,6 | 83,00 | TGD |
| **204** | MK | M | 77 | 23,5 | 87,50 | TGD |
| **205** | TFG | F | 48 | 23,9 | 75,00 | TGN |
| **206** | TFG | F | 49 | 20,8 | 70,00 | TGN |
| **207** | HOA | F | 62 | 27,0 | 86,00 | TGD |
| **208** | MM | M | 66 | 21,3 | 79,00 | TGD |
| **209** | KJ | M | 59 | 26,7 | 100,50 | GJA |
| **210** | YO | F | 71 | 18,2 | 58,00 | TGN |

**Tabela 3:** Características demográficas, antropométricas, HOMA-R, níveis de adiponectina plasmática e genótipo dos indivíduos portadores de DM (Artigo 2).

| Número | Iniciais | Sexo | Idade (anos) | IMC (kg/m²) | HOMA-R | Adiponectina (µg/ml) | T45G | G276T | A349G | Exon3 | Cintura (cm) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **1** | AG | M | 77 | 26,1 | 2,49 | 7,45 | G/G | G/G | A/G | ----- | 85,50 |
| **2** | AI | M | 66 | 24,6 | 1,81 | 22,50 | T/G | G/T | A/G | ----- | 87,50 |
| **3** | AI | M | 58 | 28,3 | 2,23 | 1,00 | T/T | G/G | A/A | ----- | 97,50 |
| **4** | AIK | M | 35 | 33,2 | 8,94 | 3,45 | T/G | G/G | A/G | ----- | 104,00 |
| **5** | AM | F | 59 | 30,1 | 2,87 | 6,00 | T/T | G/T | A/A | ----- | 93,50 |
| **6** | AMI | F | 44 | 22,9 | 1,78 | 3,15 | T/G | G/G | A/G | ----- | 78,00 |
| **7** | AS | F | 65 | 22,6 | 2,49 | 12,30 | T/T | T/T | A/A | ----- | 69,00 |
| **8** | AS | M | 42 | 38,0 | 7,99 | 5,30 | T/T | G/G | A/G | ----- | 118,50 |
| **9** | AST | M | 50 | 28,0 | 4,74 | 7,20 | T/T | G/T | A/A | ----- | 92,00 |
| **10** | ATI | M | 50 | 35,2 | 10,27 | 3,95 | T/G | G/T | A/G | ----- | 109,00 |
| **11** | ATN | M | 55 | 26,3 | 3,67 | 4,85 | T/T | G/G | A/G | ----- | 88,50 |
| **12** | BM | F | 71 | 22,7 | 2,36 | 9,95 | T/T | G/T | A/A | ----- | 89,00 |
| **13** | CAK | F | 65 | 24,5 | 1,82 | 1,40 | T/G | G/G | A/G | ----- | 82,00 |
| **14** | CEY | F | 65 | 23,4 | 4,44 | 5,50 | T/T | G/G | A/A | ----- | 76,00 |
| **15** | CHN | F | 66 | 24,8 | 9,62 | 7,95 | T/G | G/T | A/G | ----- | 78,50 |
| **16** | CMK | M | 56 | 25,6 | 6,27 | 3,25 | T/T | G/T | A/A | ----- | 86,00 |
| **17** | CU | M | 58 | 27,1 | 2,01 | 1,70 | T/G | G/G | A/G | ----- | 91,00 |
| **18** | EA | F | 72 | 25,1 | 1,09 | 5,95 | G/G | G/G | G/G | ----- | 95,10 |
| **19** | EA | F | 64 | 25,2 | 4,05 | 4,50 | T/G | G/G | A/G | ----- | 80,00 |
| **20** | EEA | F | 47 | 27,0 | 5,06 | 3,90 | T/T | G/T | A/A | ----- | 87,50 |
| **21** | EK | F | 63 | 29,9 | 10,93 | 7,20 | T/T | G/G | A/A | ----- | 89,50 |
| **22** | EK | F | 55 | 24,6 | 2,90 | 12,50 | T/T | T/T | A/A | ----- | 87,50 |
| **23** | EKS | F | 68 | 29,6 | 17,46 | 9,85 | T/G | G/G | A/A | ----- | 103,00 |
| **24** | EMFA | F | 36 | 31,8 | 3,27 | 2,55 | T/T | G/G | A/A | ----- | 89,00 |
| **25** | ENI | F | 51 | 26,9 | 3,14 | 10,55 | T/G | G/G | A/G | ----- | 87,00 |
| **26** | ES | M | 50 | 30,7 | 7,96 | 12,55 | T/G | G/G | A/G | H241P | 100,50 |
| **27** | ESHO | F | 43 | 32,5 | 4,95 | 11,10 | T/T | G/G | A/A | ----- | 90,00 |
| **28** | ESS | M | 42 | 26,0 | 3,53 | 0,90 | T/G | G/G | A/A | ----- | 89,00 |
| **29** | EYY | F | 52 | 26,1 | 3,14 | 6,20 | T/G | G/T | A/A | ----- | 90,00 |
| **30** | FFW | F | 68 | 22,8 | 4,26 | 8,75 | T/G | G/T | A/A | ----- | 81,00 |

| Número | Iniciais | Sexo | Idade (anos) | IMC (kg/m²) | HOMA-R | Adiponectina (µg/ml) | T45G | G276T | A349G | Exon3 | Cintura (cm) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **31** | FNM | M | 55 | 29,0 | 5,70 | 1,85 | T/G | G/G | A/A | ----- | 95,50 |
| **32** | FTK | M | 41 | ----- | 4,14 | 1,90 | G/G | G/G | G/G | ----- | ----- |
| **33** | FY | M | 56 | 26,8 | 13,35 | 8,40 | T/G | G/T | A/A | ----- | 90,00 |
| **34** | GMUM | F | 49 | 24,0 | 2,67 | 0,95 | T/T | G/G | A/A | ----- | 77,00 |
| **35** | GT | M | 57 | 24,8 | 4,20 | 4,90 | T/G | G/G | A/G | ----- | 91,00 |
| **36** | HF | M | 39 | 38,8 | 4,73 | 3,10 | T/G | G/T | A/A | ----- | 119,00 |
| **37** | HH | M | 50 | 27,5 | 3,56 | 2,70 | T/T | G/T | A/A | R221S | 89,00 |
| **38** | HK | M | 61 | 24,2 | 3,55 | 4,25 | T/G | G/G | A/G | ----- | 83,00 |
| **39** | HN | F | 66 | 25,3 | 2,93 | 8,50 | T/T | G/G | A/A | ----- | 84,75 |
| **40** | HO | M | 48 | 30,8 | 5,05 | 5,05 | T/G | G/T | A/A | ----- | 101,00 |
| **41** | HU | F | 62 | 30,5 | 6,62 | 3,00 | T/G | G/G | A/A | ----- | 99,00 |
| **42** | HY | F | 74 | 27,0 | 3,96 | 5,65 | T/G | G/G | ----- | ----- | 89,50 |
| **43** | HY | F | 55 | 25,7 | 4,57 | 1,45 | T/G | G/G | A/A | ----- | 83,75 |
| **44** | HYH | M | 40 | 27,5 | 5,42 | 2,55 | T/T | G/T | A/A | ----- | 87,00 |
| **45** | IG | M | 59 | 26,9 | 4,34 | 1,75 | T/T | G/G | A/A | ----- | 90,50 |
| **46** | IH | M | 73 | 24,6 | 2,78 | 6,30 | T/T | G/T | A/A | ----- | 83,50 |
| **47** | IK | M | 53 | 30,1 | 6,29 | 2,50 | T/T | G/G | A/A | ----- | 90,50 |
| **48** | IO | M | 71 | 23,0 | 2,63 | 15,50 | T/T | G/G | A/A | ----- | 79,50 |
| **49** | ISS | F | 47 | 24,7 | 3,70 | 19,10 | T/G | G/T | A/A | ----- | 75,00 |
| **50** | JAT | M | 47 | 32,8 | 3,43 | 3,55 | T/T | G/T | A/A | ----- | 104,00 |
| **51** | JCN | M | 66 | 26,8 | 4,59 | 4,00 | T/G | G/G | A/G | ----- | 89,00 |
| **52** | JJK | M | 47 | 29,7 | 3,66 | 8,20 | T/G | G/T | A/G | ----- | 94,50 |
| **53** | JN | M | 71 | 27,7 | 4,04 | 8,50 | T/G | G/G | A/G | ----- | 98,00 |
| **54** | JN | M | 59 | 28,5 | 5,58 | 4,30 | G/G | G/G | A/G | ----- | 99,25 |
| **55** | JO | F | 64 | 32,2 | 3,44 | 11,10 | T/T | G/T | A/A | ----- | 91,00 |
| **56** | JOS | F | 39 | 36,5 | 5,62 | 2,25 | T/G | G/T | A/A | ----- | 101,00 |
| **57** | KH | M | 54 | 27,0 | 6,75 | 3,50 | T/T | G/T | A/A | ----- | 86,50 |
| **58** | KH | F | 65 | 26,0 | 12,11 | 6,55 | T/G | G/G | ----- | ----- | 82,00 |
| **59** | KHN | F | 64 | 20,4 | 2,63 | 6,35 | T/T | G/G | A/A | ----- | 71,00 |
| **60** | KK | M | 41 | 34,8 | 4,17 | 8,20 | T/G | G/T | A/A | ----- | 116,00 |

| Número | Iniciais | Sexo | Idade (anos) | IMC (kg/m²) | HOMA-R | Adiponectina (µg/ml) | T45G | G276T | A349G | Exon3 | Cintura (cm) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **61** | KK | M | 75 | 28,9 | 2,13 | 2,65 | T/T | T/T | A/A | ----- | 95,50 |
| **62** | KK | M | 75 | 24,1 | 3,08 | 11,50 | T/T | G/T | A/A | ----- | 90,00 |
| **63** | KK | M | 59 | 27,8 | 3,17 | 1,50 | T/T | G/G | A/A | ----- | 90,50 |
| **64** | KK | M | 51 | 35,4 | 22,47 | 1,85 | G/G | G/G | G/G | ----- | 108,50 |
| **65** | KK | M | 57 | 26,7 | 2,96 | 3,30 | T/T | G/T | A/A | ----- | 87,50 |
| **66** | KMK | F | 66 | 28,2 | 3,77 | 3,40 | T/T | G/T | A/A | ----- | 90,00 |
| **67** | KN | M | 60 | 32,8 | 4,98 | 6,60 | T/T | G/T | A/A | ----- | 103,00 |
| **68** | KSYS | F | 43 | 31,1 | 6,46 | 7,00 | T/G | G/G | A/G | ----- | 88,00 |
| **69** | KT | M | 45 | 33,3 | 22,04 | 1,45 | T/G | G/T | A/A | ----- | 111,00 |
| **70** | KT | M | 47 | 26,8 | 9,80 | 5,60 | T/T | G/T | A/A | ----- | 96,00 |
| **71** | KU | M | 53 | 28,6 | 16,71 | 1,90 | T/G | G/T | A/A | ----- | 97,00 |
| **72** | KY | F | 61 | 21,5 | 3,89 | 7,25 | T/G | G/G | A/A | ----- | 75,50 |
| **73** | LH | F | 50 | 26,5 | 3,73 | 1,10 | T/T | G/T | A/A | R221S | 80,00 |
| **74** | LKM | F | 49 | 29,9 | 6,25 | 2,40 | T/G | G/T | A/A | ----- | 91,00 |
| **75** | LSS | F | 64 | 25,5 | 8,40 | 6,00 | T/G | G/T | A/A | ----- | 83,00 |
| **76** | LTC | F | 50 | 25,8 | 2,71 | 3,20 | T/G | G/T | A/A | ----- | 85,00 |
| **77** | LU | M | 58 | 25,2 | 5,71 | 5,85 | T/T | T/T | A/A | ----- | 88,00 |
| **78** | LY | F | 52 | 30,3 | 5,82 | 13,95 | T/G | G/G | A/A | ----- | 91,00 |
| **79** | LYK | M | 65 | 25,8 | 3,81 | 2,20 | T/T | T/T | A/A | ----- | 85,00 |
| **80** | MA | M | 35 | 28,7 | 3,64 | 3,75 | T/T | G/T | A/A | ----- | 89,00 |
| **81** | MA | M | 37 | 25,8 | 2,31 | 9,00 | G/G | G/G | G/G | ----- | 90,50 |
| **82** | MAY | F | 33 | 29,3 | 5,19 | 1,10 | T/T | G/T | A/A | ----- | 77,50 |
| **83** | MFM | F | 31 | 22,2 | 14,56 | 18,00 | T/G | G/T | A/G | ----- | 70,00 |
| **84** | MFM | F | 36 | 27,4 | 2,92 | 5,70 | T/G | G/G | A/G | ----- | 84,00 |
| **85** | MH | M | 55 | 31,1 | 6,26 | 17,00 | T/T | G/T | A/A | ----- | 104,50 |
| **86** | MHG | F | 48 | 31,2 | 2,80 | 10,00 | T/T | G/T | A/A | ----- | 97,00 |
| **87** | MHS | F | 69 | 25,8 | 2,97 | 3,60 | T/G | G/T | A/G | ----- | 95,00 |
| **88** | MHS | M | 56 | 26,3 | 3,05 | 2,65 | T/G | G/G | A/G | ----- | 91,00 |
| **89** | MJYJ | F | 43 | 27,8 | 7,00 | 3,65 | T/G | G/G | A/G | ----- | 84,00 |
| **90** | MK | F | 59 | 25,0 | 2,75 | 4,45 | T/T | G/G | A/A | ----- | 74,00 |

| Número | Iniciais | Sexo | Idade (anos) | IMC (kg/m²) | HOMA-R | Adiponectina (µg/ml) | T45G | G276T | A349G | Exon3 | Cintura (cm) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **91** | MK | M | 68 | 27,9 | 2,31 | 3,75 | T/G | G/T | A/A | ----- | 100,00 |
| **92** | MK | M | 64 | 25,8 | 3,18 | 5,15 | T/T | G/G | A/A | ----- | 77,50 |
| **93** | MK | M | 49 | 25,6 | 3,18 | 30,40 | T/T | G/G | A/A | ----- | 87,50 |
| **94** | MK | F | 69 | 24,6 | 4,50 | 12,35 | T/T | G/G | A/A | ----- | 90,00 |
| **95** | MKBNS | F | 51 | 27,9 | 6,23 | 6,20 | T/G | G/T | ----- | ----- | 88,00 |
| **96** | MKG | F | 60 | 23,2 | 3,05 | 5,30 | T/G | G/T | A/G | ----- | 76,50 |
| **97** | MKK | M | 45 | 26,2 | 2,63 | 16,65 | T/G | G/T | ----- | ----- | 93,00 |
| **98** | MKT | M | 35 | 31,1 | 8,81 | 2,20 | T/G | G/T | A/G | ----- | 103,00 |
| **99** | MLFM | F | 42 | 24,8 | 3,90 | 4,55 | T/T | G/G | A/A | ----- | 75,00 |
| **100** | MM | F | 72 | 29,8 | 3,00 | 9,80 | T/T | T/T | A/A | ----- | 97,50 |
| **101** | MM | F | 50 | 27,7 | 4,94 | 4,60 | T/T | T/T | A/A | ----- | 82,00 |
| **102** | MMM | F | 47 | 24,3 | 2,91 | 5,45 | T/T | G/T | A/A | ----- | 75,50 |
| **103** | MMN | M | 41 | 23,1 | 2,67 | 9,35 | T/G | G/G | A/G | H241P | 86,00 |
| **104** | MNC | F | 58 | 25,5 | 3,91 | 2,85 | T/T | G/T | A/A | ----- | 82,00 |
| **105** | MNN | F | 74 | 23,4 | 6,88 | 5,50 | T/T | G/G | A/A | ----- | 78,00 |
| **106** | MO | F | 48 | 27,5 | 5,54 | 7,70 | T/G | G/T | A/G | ----- | 97,00 |
| **107** | MS | F | 56 | 26,0 | 4,61 | 11,00 | T/G | G/T | A/G | ----- | 84,00 |
| **108** | MT | M | 46 | 28,2 | 4,32 | 5,55 | T/G | G/T | A/G | ----- | 89,50 |
| **109** | MTJT | F | 47 | 23,2 | 2,52 | 4,35 | T/T | G/T | ----- | I164T | 80,00 |
| **110** | MTS | F | 46 | 29,9 | 3,35 | 4,00 | T/T | G/T | ----- | ----- | 92,00 |
| **111** | MTT | F | 52 | 28,0 | 9,31 | 1,10 | T/T | G/T | A/A | ----- | 91,00 |
| **112** | MTY | M | 39 | 28,9 | 2,58 | 1,60 | T/T | G/G | A/A | ----- | 91,50 |
| **113** | MY | F | 54 | 27,2 | 10,91 | 6,30 | T/T | G/T | A/A | ----- | 89,00 |
| **114** | MY | M | 49 | 29,8 | 5,09 | 1,95 | T/T | G/G | A/A | ----- | 98,00 |
| **115** | MY | F | 55 | 25,9 | 6,14 | 9,20 | T/G | G/G | A/G | ----- | 80,00 |
| **116** | MY | F | 40 | 20,9 | 4,77 | 7,10 | T/T | G/G | A/A | ----- | 74,00 |
| **117** | MYH | M | 49 | 30,9 | 2,00 | 1,95 | T/G | G/T | ----- | ----- | 98,00 |
| **118** | NF | F | 67 | 22,8 | 2,07 | 6,70 | T/T | G/G | A/A | ----- | 84,00 |
| **119** | NK | F | 60 | 31,4 | 3,20 | 5,95 | T/G | G/T | A/G | ----- | 97,50 |
| **120** | NKD | F | 59 | 24,2 | 3,01 | 9,60 | T/G | G/T | A/A | ----- | 80,00 |

| Número | Iniciais | Sexo | Idade (anos) | IMC (kg/m²) | HOMA-R | Adiponectina (µg/ml) | T45G | G276T | A349G | Exon3 | Cintura (cm) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **121** | NM | F | 57 | 26,4 | 3,40 | 12,50 | T/T | G/G | A/A | ----- | 81,00 |
| **122** | NMS | F | 55 | 24,5 | 2,63 | 8,70 | T/T | G/T | A/A | ----- | 77,00 |
| **123** | NN | F | 57 | 25,0 | 2,13 | 29,00 | T/T | G/G | A/A | ----- | 78,50 |
| **124** | NSJ | M | 53 | 25,4 | 3,61 | 1,60 | T/G | G/T | A/A | ----- | 95,50 |
| **125** | NTK | M | 55 | 29,4 | 1,45 | 2,60 | T/G | G/G | A/G | ----- | 100,00 |
| **126** | NTN | F | 53 | 29,4 | 4,11 | 5,96 | T/G | G/T | A/A | ----- | 92,00 |
| **127** | OD | M | 61 | 24,7 | 4,99 | 2,90 | T/G | G/G | A/G | ----- | 87,00 |
| **128** | OM | M | 52 | 33,2 | 3,03 | 9,20 | T/G | G/T | A/G | ----- | 102,00 |
| **129** | OO | F | 58 | 23,3 | 2,58 | 8,70 | T/G | G/T | A/G | ----- | 84,00 |
| **130** | PTI | M | 47 | 28,3 | 11,87 | 4,20 | T/T | G/T | A/A | ----- | 95,00 |
| **131** | QIK | M | 53 | 30,3 | 8,06 | 1,45 | G/G | G/G | G/G | ----- | 97,00 |
| **132** | QY | F | 47 | 34,4 | 3,41 | 11,55 | T/T | G/T | A/G | ----- | 88,00 |
| **133** | RKK | M | 32 | 28,1 | 2,65 | 1,45 | T/T | G/G | A/A | ----- | 90,00 |
| **134** | RMF | M | 38 | 27,6 | 2,07 | 1,25 | T/T | G/G | ----- | ----- | 91,00 |
| **135** | RSG | F | 32 | 22,4 | 2,38 | 7,90 | T/G | G/G | A/G | H241P | 76,00 |
| **136** | RY | F | 70 | 24,4 | 2,01 | 9,15 | T/T | G/G | A/A | ----- | 76,50 |
| **137** | SA | M | 50 | 27,8 | 5,29 | 2,60 | T/G | G/G | A/G | ----- | 100,00 |
| **138** | SA | F | 53 | 28,0 | 11,46 | 7,91 | T/G | G/T | A/G | ----- | 86,00 |
| **139** | SG | F | 72 | 20,8 | 3,84 | 6,65 | T/T | G/G | A/A | ----- | 69,00 |
| **140** | SH | M | 52 | 29,7 | 6,06 | 14,00 | T/G | G/G | A/A | ----- | 104,00 |
| **141** | SH | F | 68 | 32,6 | 6,72 | 10,95 | T/T | G/T | A/A | ----- | 91,00 |
| **142** | SH | F | 66 | 32,8 | 2,85 | 11,80 | T/G | G/T | A/G | ----- | 94,50 |
| **143** | SH | M | 53 | 25,6 | 3,53 | 2,75 | T/T | G/T | A/A | ----- | 90,00 |
| **144** | SHY | M | 41 | 40,8 | 10,19 | 3,40 | T/G | G/T | A/G | ----- | 129,00 |
| **145** | SI | M | 52 | 23,7 | 5,19 | 3,10 | T/G | G/T | A/G | I164T | 87,00 |
| **146** | SK | F | 60 | 25,4 | 9,30 | 4,40 | G/G | G/G | G/G | ----- | 90,00 |
| **147** | SK | M | 63 | 22,5 | 2,47 | 3,00 | T/G | G/T | A/G | ----- | 86,00 |
| **148** | SK | M | 66 | 26,8 | 9,55 | 2,50 | T/G | G/G | A/G | ----- | 96,00 |
| **149** | SK | F | 50 | 31,9 | 2,62 | 25,70 | T/T | T/T | A/A | ----- | 89,00 |
| **150** | SM | F | 65 | 25,5 | 6,05 | 5,10 | T/G | G/T | A/A | ----- | 85,00 |

| Número | Iniciais | Sexo | Idade (anos) | IMC (kg/m²) | HOMA-R | Adiponectina (µg/ml) | T45G | G276T | A349G | Exon3 | Cintura (cm) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **151** | SM | F | 69 | 25,1 | 2,26 | 14,40 | T/G | G/T | A/G | ----- | 82,00 |
| **152** | SM | M | 66 | 27,2 | 4,29 | 3,90 | T/T | G/G | A/G | ----- | 100,00 |
| **153** | SNA | F | 44 | 24,0 | 2,28 | 2,60 | T/G | G/G | A/G | ----- | 78,00 |
| **154** | SNF | F | 51 | 28,2 | 9,14 | 3,25 | T/T | G/T | A/A | ----- | 91,00 |
| **155** | SO | M | 54 | 21,8 | 2,91 | 5,75 | T/G | G/G | A/G | ----- | 80,00 |
| **156** | SO | M | 73 | 28,7 | 2,68 | 5,50 | T/T | G/T | A/A | ----- | 94,50 |
| **157** | SS | F | 65 | 26,4 | 2,86 | 10,65 | T/G | G/T | A/G | ----- | 92,50 |
| **158** | ST | M | 54 | 28,9 | 7,90 | 6,70 | G/G | G/G | G/G | ----- | 100,00 |
| **159** | SY | M | 48 | 24,4 | 2,15 | 2,70 | T/T | G/T | A/A | ----- | 82,00 |
| **160** | TF | M | 61 | 24,9 | 5,99 | 5,30 | T/G | G/G | A/G | ----- | 91,50 |
| **161** | TG | M | 45 | 26,2 | 3,83 | 6,70 | T/G | G/T | A/A | ----- | 96,00 |
| **162** | TGK | F | 52 | 27,8 | 5,84 | 5,40 | T/T | G/T | A/A | ----- | 88,20 |
| **163** | TH | M | 59 | 34,1 | 7,97 | 4,30 | T/T | T/T | A/A | ----- | 108,00 |
| **164** | TIM | F | 47 | 26,7 | 2,43 | 9,55 | T/G | G/T | A/G | ----- | 80,00 |
| **165** | TJCI | M | 45 | 21,5 | 3,58 | 3,80 | T/G | G/T | A/A | ----- | 85,00 |
| **166** | TK | M | 61 | 27,3 | 3,11 | 8,70 | T/T | G/T | ----- | ----- | 96,25 |
| **167** | TM | M | 62 | 26,6 | 3,29 | 1,65 | T/G | G/G | A/A | ----- | 98,00 |
| **168** | TN | F | 44 | 35,8 | 10,97 | 2,40 | T/G | G/T | A/A | ----- | 95,00 |
| **169** | TO | M | 66 | 25,5 | 2,87 | 4,45 | T/T | G/T | A/A | ----- | 89,00 |
| **170** | TOF | F | 76 | 33,7 | 2,33 | 17,00 | T/T | T/T | A/A | ----- | 104,00 |
| **171** | TS | M | 59 | 23,4 | 2,22 | 4,60 | T/T | G/T | A/A | ----- | 82,00 |
| **172** | TSY | F | 51 | 31,1 | 5,37 | 9,75 | T/G | G/G | A/G | ----- | 96,00 |
| **173** | TT | M | 76 | 26,4 | 2,09 | 5,40 | T/G | G/T | A/G | ----- | 94,00 |
| **174** | TT | M | 74 | 32,5 | 3,22 | 9,90 | T/T | G/G | A/A | ----- | 105,00 |
| **175** | TT | M | 46 | 27,4 | 2,97 | 6,15 | T/T | G/T | A/A | ----- | 87,00 |
| **176** | TT | M | 75 | 23,7 | 4,19 | 5,27 | T/G | G/G | A/A | ----- | 84,50 |
| **177** | TTI | F | 68 | 37,9 | 3,76 | 8,00 | T/T | G/T | A/A | ----- | 95,00 |
| **178** | TTM | F | 61 | 27,2 | 5,15 | 2,77 | T/G | G/T | A/G | ----- | 86,50 |
| **179** | TTMM | F | 48 | 29,7 | 2,97 | 3,10 | T/T | G/G | A/A | ----- | 87,00 |
| **180** | TUI | F | 70 | 21,8 | 2,69 | 8,55 | T/T | G/T | A/A | ----- | 75,50 |

| Número | Iniciais | Sexo | Idade (anos) | IMC (kg/m²) | HOMA-R | Adiponectina (µg/ml) | T45G | G276T | A349G | Exon3 | Cintura (cm) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **181** | TUS | F | 53 | 25,6 | 2,98 | 8,15 | G/G | G/T | A/A | ----- | 84,00 |
| **182** | TYSJ | F | 45 | 30,0 | 7,84 | 9,90 | T/G | G/T | A/G | ----- | 94,00 |
| **183** | VM | M | 39 | 32,0 | 5,21 | 3,40 | T/G | G/T | A/G | ----- | 104,00 |
| **184** | VOF | F | 70 | 24,7 | 5,24 | 10,50 | T/G | G/T | A/A | ----- | 87,00 |
| **185** | WTM | M | 45 | 27,6 | 4,89 | 3,50 | T/G | G/T | A/A | ----- | 96,00 |
| **186** | YA | M | 59 | 23,5 | 2,26 | 3,60 | T/G | G/G | A/G | ----- | 88,00 |
| **187** | YK | M | 62 | 26,6 | 2,87 | 3,90 | T/T | G/T | A/G | ----- | 94,00 |
| **188** | YK | M | 50 | 21,5 | 2,02 | 15,50 | T/T | G/T | A/G | ----- | 84,00 |
| **189** | YK | F | 68 | 24,4 | 2,54 | 5,45 | T/T | G/T | A/G | ----- | 88,00 |
| **190** | YM | M | 62 | 30,2 | 2,26 | 5,25 | T/T | G/G | A/A | ----- | 101,00 |
| **191** | YMO | F | 62 | 22,1 | 15,90 | 11,00 | G/G | G/G | G/G | ----- | 80,00 |
| **192** | YN | M | 61 | 33,6 | 2,65 | 3,25 | T/G | G/T | A/G | ----- | 104,00 |
| **193** | YS | F | 58 | 27,9 | 11,40 | 6,45 | G/G | G/G | G/G | ----- | 86,50 |
| **194** | YS | M | 73 | 32,0 | 2,07 | 27,50 | T/T | G/T | A/A | ----- | 102,50 |
| **195** | YT | F | 69 | 26,0 | 2,91 | 6,00 | T/G | G/G | A/A | ----- | 85,00 |
| **196** | YT | M | 56 | 32,1 | 8,30 | 2,25 | T/G | G/T | A/A | ----- | 107,00 |
| **197** | YT | F | 62 | 25,5 | 2,68 | 4,50 | T/T | T/T | A/G | ----- | 76,00 |
| **198** | YUM | F | 35 | 23,1 | 2,39 | 3,00 | T/T | G/T | A/A | ----- | 90,00 |
| **199** | YY | M | 61 | 24,5 | 2,68 | 3,45 | T/G | G/T | A/A | ----- | 92,50 |
| **200** | ZH | M | 69 | 22,2 | 3,06 | 4,75 | T/T | G/T | A/A | ----- | 85,00 |

**Tabela 4:** Características demográficas, antropométricas, HOMA-R, níveis de adiponectina plasmática e genótipo dos indivíduos com TNG (Atrigo 2).

| Número | Iniciais | Sexo | Idade (anos) | IMC (kg/m²) | HOMA-R | Adiponectina (µg/ml) | T45G | G276T | A349G | Exon3 | Cintura (cm) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **201** | AT | F | 68 | 21,69 | 1,07 | 6,10 | T/T | G/T | A/A | ----- | 73,00 |
| **202** | AB | F | 64 | 22,91 | 0,93 | 11,45 | T/G | G/T | A/G | ----- | 78,00 |
| **203** | AHT | F | 48 | 18,71 | 0,59 | 19,80 | T/G | G/G | A/G | ----- | 66,50 |
| **204** | AK | F | 47 | 25,70 | 1,96 | 7,30 | T/G | G/T | A/G | ----- | 75,50 |
| **205** | AMHT | F | 42 | 22,43 | 1,45 | 9,55 | T/T | G/T | A/A | ----- | 74,00 |
| **206** | AMO | F | 47 | 25,47 | 0,93 | 1,70 | T/G | G/G | A/G | ----- | 80,50 |
| **207** | AMY | M | 49 | 20,97 | 1,11 | 14,60 | T/T | G/T | A/A | ----- | 79,00 |
| **208** | ANO | F | 65 | 24,29 | 0,62 | 12,15 | T/T | G/G | A/A | ----- | 80,50 |
| **209** | AOS | F | 64 | 22,34 | 1,37 | 1,90 | T/T | G/G | A/A | ----- | 80,00 |
| **210** | ASY | M | 32 | 21,00 | 1,41 | 2,25 | T/G | G/T | A/G | ----- | 78,00 |
| **211** | AT | M | 62 | 23,08 | 0,80 | 12,85 | T/G | G/G | A/G | ----- | 80,50 |
| **212** | ATA | M | 48 | 22,00 | 0,70 | 3,15 | G/G | G/G | G/G | H241P | 80,50 |
| **213** | ATFK | F | 40 | 15,89 | 1,46 | 12,00 | G/G | G/G | G/G | ----- | 62,00 |
| **214** | AY | F | 43 | 27,66 | 1,74 | 8,35 | T/G | G/G | A/G | ----- | 87,00 |
| **215** | AYS | M | 41 | 22,41 | 1,03 | 3,10 | T/G | G/T | A/G | ----- | 78,50 |
| **216** | CM | F | 30 | 20,92 | 1,28 | 20,00 | T/T | G/T | A/A | ----- | 73,00 |
| **217** | CNS | M | 49 | 19,42 | 0,97 | 13,20 | T/G | G/T | A/G | ----- | 77,00 |
| **218** | CSK | M | 42 | 18,14 | 1,62 | 19,00 | T/T | G/T | A/A | ----- | 74,50 |
| **219** | CTTI | F | 47 | 23,93 | 0,83 | 5,25 | T/G | G/T | A/G | ----- | 77,50 |
| **220** | CU | M | 45 | 30,11 | 1,61 | 2,35 | T/T | G/G | A/A | ----- | 97,00 |
| **221** | DM | F | 58 | 23,37 | 1,96 | 8,95 | T/T | G/G | A/A | ----- | 70,50 |
| **222** | EEK | F | 39 | 18,41 | 0,52 | 3,45 | G/G | G/G | G/G | ----- | 62,00 |
| **223** | EHHT | F | 41 | 19,48 | 1,99 | 4,60 | T/G | G/T | A/G | ----- | 79,50 |
| **224** | EHI | M | 42 | 22,46 | 0,39 | 11,40 | G/G | G/G | A/G | ----- | 80,00 |
| **225** | EIG | M | 51 | 25,29 | 1,72 | 7,00 | T/G | G/G | A/G | ----- | 80,00 |
| **226** | EMG | M | 34 | 27,18 | 1,42 | 3,40 | T/T | G/G | A/A | ----- | 85,00 |
| **227** | EMI | F | 56 | 24,39 | 1,86 | 7,00 | T/T | G/T | A/A | ----- | 81,00 |
| **228** | ET | F | 58 | 26,18 | 0,97 | 16,35 | T/G | G/T | A/G | ----- | 78,00 |
| **229** | ETU | F | 46 | 28,15 | 1,14 | 4,35 | T/G | G/G | A/G | ----- | 83,00 |
| **230** | EU | F | 40 | 20,22 | 0,67 | 4,50 | T/T | G/G | A/A | ----- | 78,00 |

| Número | Iniciais | Sexo | Idade (anos) | IMC (kg/m²) | HOMA-R | Adiponectina (µg/ml) | T45G | G276T | A349G | Exon3 | Cintura (cm) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **231** | EY | F | 51 | 23,90 | 1,04 | 10,90 | T/G | G/T | A/G | ----- | 80,00 |
| **232** | FMOO | F | 42 | 21,97 | 0,25 | 3,65 | T/G | G/T | A/G | ----- | 70,00 |
| **233** | FNG | F | 37 | 20,26 | 0,41 | 19,50 | T/G | G/T | A/G | ----- | 76,00 |
| **234** | FO | F | 55 | 20,39 | 0,86 | 5,75 | T/T | G/T | A/A | ----- | 73,00 |
| **235** | FO | F | 63 | 24,35 | ----- | 5,60 | T/T | G/G | A/A | ----- | 92,50 |
| **236** | FS | F | 68 | 20,47 | 1,54 | 10,50 | T/G | G/G | A/G | ----- | 64,00 |
| **237** | FS | M | 62 | 26,53 | 1,58 | 1,00 | G/G | G/G | G/G | ----- | 92,00 |
| **238** | FU | F | 55 | 22,43 | 3,35 | 10,40 | T/T | G/G | A/G | ----- | 70,75 |
| **239** | HÁ | M | 53 | 23,40 | 1,24 | 1,85 | T/T | G/G | A/A | ----- | 81,00 |
| **240** | HE | M | 70 | 23,03 | 0,43 | 6,00 | T/G | G/T | A/A | ----- | 87,00 |
| **241** | HI | F | 77 | 22,55 | 1,41 | 8,40 | T/G | G/G | A/G | ----- | 79,00 |
| **242** | HI | F | 54 | 24,19 | 1,16 | 13,70 | T/T | G/T | A/A | ----- | 84,50 |
| **243** | HK | M | 70 | 19,71 | 0,83 | 3,20 | T/T | G/T | A/A | ----- | 78,00 |
| **244** | HKO | F | 50 | 25,25 | 1,68 | 4,25 | T/T | G/G | A/A | ----- | 84,50 |
| **245** | HKTO | F | 42 | 20,55 | 1,05 | 24,35 | T/T | G/G | A/A | ----- | 65,00 |
| **246** | HM | F | 63 | 17,46 | ----- | 20,00 | G/G | G/G | G/G | ----- | 70,75 |
| **247** | HMB | F | 52 | 23,20 | 1,29 | 3,25 | T/T | G/T | A/A | ----- | 76,50 |
| **248** | HMI | M | 44 | 23,62 | 1,65 | 6,15 | T/G | G/G | A/G | ----- | 89,10 |
| **249** | HMK | F | 49 | 23,85 | 1,69 | 6,65 | G/G | G/G | G/G | ----- | 81,00 |
| **250** | HN | F | 74 | 27,40 | 1,81 | 21,70 | T/T | G/T | A/A | ----- | 85,00 |
| **251** | HO | M | 72 | 23,30 | 1,48 | 5,85 | T/G | G/G | A/G | ----- | 86,00 |
| **252** | HO | M | 60 | 22,96 | 0,85 | 7,15 | T/G | G/G | A/G | ----- | 81,00 |
| **253** | HO | M | 63 | 21,02 | 1,75 | 5,60 | T/G | G/G | A/G | ----- | 77,50 |
| **254** | HS | F | 45 | 21,41 | 0,59 | 6,30 | T/G | G/G | A/G | ----- | 74,00 |
| **255** | HTG | F | 59 | 24,25 | ----- | 2,10 | T/T | G/G | A/A | R221S | 80,50 |
| **256** | IA | F | 59 | 21,66 | 0,27 | 13,95 | T/T | G/T | A/A | ----- | 71,00 |
| **257** | IMAF | F | 45 | 22,43 | 1,60 | 10,30 | T/T | G/G | A/A | ----- | 71,00 |
| **258** | IST | F | 63 | 17,98 | 0,69 | 4,45 | T/G | G/G | A/G | ----- | 74,50 |
| **259** | IT | M | 40 | 27,91 | 0,61 | 1,10 | T/G | G/T | A/G | ----- | 87,00 |
| **260** | IYST | F | 33 | 23,65 | 1,24 | 19,75 | T/T | G/T | A/A | ----- | 68,00 |

| Número | Iniciais | Sexo | Idade (anos) | IMC (kg/m²) | HOMA-R | Adiponectina (µg/ml) | T45G | G276T | A349G | Exon3 | Cintura (cm) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **261** | JHKC | F | 47 | 24,98 | 1,55 | 14,75 | T/T | G/T | A/A | ----- | 75,00 |
| **262** | JKK | F | 42 | 24,50 | 0,66 | 13,35 | T/G | G/T | A/G | ----- | 78,00 |
| **263** | JKN | M | 45 | 25,55 | 2,45 | 2,25 | T/T | G/G | A/A | ----- | 92,00 |
| **264** | JMNS | F | 44 | 22,80 | 1,83 | 8,80 | T/T | G/G | A/A | ----- | 70,00 |
| **265** | JTK | M | 44 | 25,47 | 0,83 | 9,30 | T/G | G/G | A/A | ----- | 80,75 |
| **266** | JTT | M | 41 | 27,02 | 1,32 | 9,28 | T/G | G/G | A/G | ----- | 89,00 |
| **267** | KH | F | 70 | 18,60 | 0,76 | 21,25 | T/G | G/G | ----- | ----- | 63,00 |
| **268** | KH | F | 68 | 23,32 | 1,38 | 13,00 | T/G | G/T | A/A | ----- | 83,50 |
| **269** | KHK | F | 54 | 27,53 | 1,82 | 27,85 | T/T | G/T | ----- | ----- | 77,50 |
| **270** | KK | F | 75 | 27,06 | 1,28 | 10,00 | G/G | G/G | A/A | ----- | 83,25 |
| **271** | KK | F | 79 | 20,41 | 0,43 | 12,50 | T/T | G/T | A/A | ----- | 73,50 |
| **272** | KK | F | 86 | 21,84 | 1,19 | 24,15 | T/T | G/T | A/A | ----- | 78,00 |
| **273** | KKT | F | 51 | 21,98 | 1,69 | 10,80 | T/G | G/T | A/G | ----- | 74,50 |
| **274** | KM | M | 46 | 20,55 | 1,85 | 7,35 | T/T | G/T | A/A | ----- | 81,50 |
| **275** | KNI | F | 50 | 21,33 | 0,84 | 8,50 | T/G | G/G | A/G | ----- | 66,00 |
| **276** | KS | M | 80 | 20,70 | 0,49 | 19,50 | G/G | G/G | G/G | ----- | 80,00 |
| **277** | KT | M | 47 | 23,37 | 0,65 | 6,90 | T/T | G/T | A/A | ----- | 81,00 |
| **278** | KY | M | 67 | 24,03 | 0,56 | 8,85 | T/T | G/G | A/A | ----- | 83,00 |
| **279** | LEM | M | 43 | 22,55 | 0,63 | 2,55 | T/G | G/T | A/G | ----- | 80,00 |
| **280** | LKO | M | 67 | 25,87 | 2,41 | 5,20 | T/T | G/T | A/A | ----- | 86,50 |
| **281** | LLIK | F | 41 | 24,12 | 1,67 | 12,90 | T/T | G/G | A/A | ----- | 80,00 |
| **282** | LMIA | F | 53 | 27,04 | 1,91 | 11,90 | G/G | G/G | A/G | ----- | 87,50 |
| **283** | LMOG | F | 34 | 21,68 | 0,83 | 11,20 | T/G | G/T | A/A | ----- | 77,00 |
| **284** | LO | M | 50 | 25,36 | 0,93 | 5,05 | T/T | G/G | A/A | ----- | 82,00 |
| **285** | LSY | F | 44 | 23,60 | 1,39 | 2,50 | T/T | G/T | A/A | ----- | 78,00 |
| **286** | MAN | F | 35 | 25,47 | 1,33 | 8,35 | T/T | T/T | A/A | ----- | 78,00 |
| **287** | MF | F | 75 | 19,20 | 1,31 | 12,06 | T/T | G/G | A/A | ----- | 67,00 |
| **288** | MH | F | 50 | 21,72 | 0,74 | 2,50 | T/T | G/T | A/A | ----- | 73,00 |
| **289** | MH | M | 74 | 24,57 | 0,43 | 5,60 | T/G | G/G | A/G | ----- | 85,50 |
| **290** | MK | M | 57 | 24,31 | ----- | 1,80 | T/T | G/G | A/A | ----- | 82,00 |

| Número | Iniciais | Sexo | Idade (anos) | IMC (kg/m²) | HOMA-R | Adiponectina (µg/ml) | T45G | G276T | A349G | Exon3 | Cintura (cm) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **291** | MK | M | 40 | 25,22 | 1,29 | 5,35 | T/G | G/T | A/A | ----- | 85,00 |
| **292** | MK | F | 77 | 23,56 | 1,57 | 8,15 | T/G | G/G | A/G | ----- | 73,50 |
| **293** | MKI | F | 68 | 18,50 | 0,84 | 22,30 | T/T | G/T | A/A | ----- | 65,00 |
| **294** | MKM | F | 60 | 24,08 | 1,98 | 19,05 | T/T | G/T | A/A | ----- | 77,00 |
| **295** | MLEHT | F | 47 | 25,10 | 1,07 | 7,25 | G/G | G/G | G/G | ----- | 75,00 |
| **296** | MM | F | 52 | 23,78 | 1,03 | 3,55 | T/G | G/T | A/G | ----- | 74,00 |
| **297** | MM | F | 74 | 18,06 | 2,12 | 12,25 | T/T | T/T | G/G | ----- | 61,00 |
| **298** | MM | M | 43 | 21,83 | 1,10 | 20,00 | T/T | G/G | A/G | ----- | 80,75 |
| **299** | MMM | F | 57 | 21,53 | O,68 | 25,00 | T/G | G/G | A/G | ----- | 71,00 |
| **300** | MMY | F | 44 | 19,99 | 0,48 | 17,00 | T/G | G/G | A/G | ----- | 65,00 |
| **301** | MO | M | 64 | 28,18 | 1,95 | 2,15 | T/T | G/G | A/A | ----- | 101,75 |
| **302** | MO | M | 66 | 20,12 | 0,54 | 11,25 | T/G | G/T | ----- | ----- | 72,00 |
| **303** | MOO | F | 58 | 23,31 | 1,50 | 17,55 | T/G | G/T | A/G | ----- | 75,00 |
| **304** | MOP | F | 70 | 36,14 | ----- | 6,15 | T/T | G/T | A/A | ----- | 103,40 |
| **305** | MS | F | 59 | 20,72 | 1,20 | 16,95 | T/T | G/T | A/A | ----- | 77,25 |
| **306** | MSD | F | 54 | 22,77 | 1,02 | 5,25 | T/G | G/G | A/G | ----- | 73,00 |
| **307** | MSE | F | 48 | 21,80 | 1,35 | 23,65 | T/T | G/T | A/A | ----- | 67,25 |
| **308** | MSM | F | 34 | 21,44 | 1,03 | 4,45 | T/T | T/T | A/A | ----- | 68,50 |
| **309** | MSY | F | 69 | 22,88 | ----- | 6,55 | T/G | G/G | A/G | ----- | 78,50 |
| **310** | MT | M | 32 | 19,25 | 1,13 | 18,40 | T/T | G/G | A/A | ----- | 71,00 |
| **311** | MT | F | 54 | 20,09 | 0,64 | 5,85 | T/T | G/T | A/A | ----- | 71,00 |
| **312** | MT | M | 66 | 20,81 | 1,54 | 6,30 | T/T | G/T | A/A | ----- | 82,00 |
| **313** | MTI | F | 69 | 25,32 | 1,20 | 22,50 | T/T | G/G | A/A | ----- | 85,50 |
| **314** | MTSR | F | 41 | 22,56 | 1,39 | 6,90 | T/G | G/G | A/G | ----- | 71,50 |
| **315** | NAM | F | 31 | 18,93 | 1,41 | 9,35 | T/T | G/T | A/A | ----- | 69,50 |
| **316** | NF | F | 41 | 20,18 | 1,56 | 7,85 | T/T | G/T | A/A | ----- | 66,75 |
| **317** | NF | M | 34 | 21,55 | 1,50 | 6,70 | T/T | G/T | A/A | ----- | 79,50 |
| **318** | NH | M | 66 | 28,11 | 1,20 | 3,00 | T/G | G/T | A/G | ----- | 93,50 |
| **319** | NID | F | 59 | 24,64 | 1,59 | 13,50 | T/G | G/T | A/G | ----- | 74,50 |
| **320** | NK | F | 52 | 22,71 | 1,66 | 15,70 | T/T | G/T | A/A | ----- | 74,00 |

| Número | Iniciais | Sexo | Idade (anos) | IMC (kg/m²) | HOMA-R | Adiponectina (µg/ml) | T45G | G276T | A349G | Exon3 | Cintura (cm) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **321** | NM | M | 77 | 24,84 | ----- | 4,75 | T/T | G/T | A/A | ----- | 87,00 |
| **322** | NM | M | 45 | 24,61 | 1,97 | 2,40 | T/T | G/T | A/A | ----- | 88,00 |
| **323** | NNM | F | 47 | 22,69 | 0,60 | 26,80 | T/G | G/T | A/G | H241P | 72,00 |
| **324** | NO | F | 43 | 18,76 | 1,44 | 15,00 | T/G | G/T | A/G | ----- | 64,00 |
| **325** | NO | M | 69 | 26,15 | 1,07 | 7,80 | T/T | T/T | A/A | ----- | 98,50 |
| **326** | NTS | M | 36 | 17,67 | 0,54 | 15,75 | T/T | G/G | A/A | ----- | 67,00 |
| **327** | NUS | F | 69 | 26,46 | 1,35 | 16,50 | T/G | G/G | A/G | ----- | 83,00 |
| **328** | OAY | M | 36 | 22,84 | 0,83 | 6,75 | T/T | G/G | A/A | ----- | 81,00 |
| **329** | OOF | F | 62 | 23,89 | 1,58 | 20,65 | T/G | G/G | A/G | ----- | 77,00 |
| **330** | OSIK | F | 49 | 28,51 | 1,59 | 9,10 | T/T | G/T | A/A | ----- | 89,00 |
| **331** | PMS | M | 47 | 22,78 | 1,89 | 3,25 | T/G | G/T | A/G | ----- | 79,50 |
| **332** | PT | N | 49 | 22,90 | 1,43 | 10,00 | T/G | G/G | A/G | ----- | 80,00 |
| **333** | RAM | M | 39 | 23,62 | 0,77 | 7,90 | T/G | G/G | A/G | ----- | 86,50 |
| **334** | RFKS | F | 36 | 24,95 | 1,51 | 8,00 | T/T | G/T | A/A | ----- | 78,00 |
| **335** | RMHC | F | 43 | 23,85 | 1,68 | 5,80 | T/T | G/T | A/A | ----- | 70,50 |
| **336** | RNM | M | 33 | 26,33 | 1,27 | 4,75 | T/T | G/G | A/A | ----- | 83,50 |
| **337** | SAUT | F | 42 | 26,32 | 1,81 | 7,65 | T/G | G/T | G/G | ----- | 79,00 |
| **338** | SE | F | 51 | 21,94 | 1,03 | 18,50 | T/T | G/T | A/A | ----- | 75,25 |
| **339** | SH | F | 67 | 18,80 | 0,49 | 6,91 | T/T | G/T | ----- | ----- | 64,50 |
| **340** | SHK | M | 40 | 21,27 | 1,13 | 17,00 | T/G | G/T | A/G | ----- | 80,00 |
| **341** | SIN | F | 59 | 21,78 | 0,49 | 17,00 | T/T | G/G | A/A | ----- | 71,00 |
| **342** | SK | F | 50 | 22,68 | 2,20 | 6,30 | T/G | G/G | A/G | ----- | 77,00 |
| **343** | SK | M | 71 | 20,52 | 0,81 | 19,30 | T/T | T/T | A/A | ----- | 70,75 |
| **344** | SKT | F | 50 | 17,91 | 0,60 | 16,00 | T/G | G/T | A/G | ----- | 60,00 |
| **345** | SM | M | 39 | 24,63 | 2,02 | 4,65 | T/T | G/T | A/A | ----- | 79,00 |
| **346** | SM | F | 64 | 25,00 | 1,56 | 13,50 | T/T | G/T | A/A | ----- | 84,00 |
| **347** | SMMA | F | 36 | 23,99 | 1,18 | 21,50 | T/G | G/T | A/G | ----- | 77,00 |
| **348** | SN | F | 54 | 21,57 | 1,54 | 6,35 | T/G | G/T | A/G | ----- | 70,00 |
| **349** | SN | M | 55 | 21,98 | 0,99 | 8,05 | T/T | G/T | A/A | ----- | 74,00 |
| **350** | SN | M | 74 | 24,34 | 0,74 | 20,35 | T/G | G/G | A/G | ----- | 94,50 |

| Número | Iniciais | Sexo | Idade (anos) | IMC (kg/m²) | HOMA-R | Adiponectina (µg/ml) | T45G | G276T | A349G | Exon3 | Cintura (cm) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **351** | SO | M | 65 | 19,74 | 0,80 | 6,20 | T/G | G/G | A/G | ----- | 77,00 |
| **352** | SS | F | 69 | 19,18 | 1,57 | 24,10 | T/G | G/G | A/G | ----- | 69,50 |
| **353** | SSKN | F | 35 | 20,39 | 1,09 | 5,45 | T/G | G/G | A/G | H241P | 64,50 |
| **354** | SSN | F | 80 | 22,71 | 1,07 | 21,00 | T/G | G/T | A/G | ----- | 82,25 |
| **355** | SST | F | 54 | 21,19 | 1,65 | 9,90 | T/G | G/T | A/G | H241P | 74,50 |
| **356** | ST | F | 86 | 22,05 | 0,60 | 12,70 | G/G | G/G | G/G | ----- | 87,00 |
| **357** | SU | F | 60 | 21,64 | 0,98 | 21,00 | T/T | G/G | A/A | ----- | 79,50 |
| **358** | SWK | F | 60 | 23,95 | 1,16 | 12,80 | T/T | G/T | A/A | ----- | 78,00 |
| **359** | TF | M | 64 | 19,38 | 1,71 | 16,00 | T/T | G/G | A/A | ----- | 76,00 |
| **360** | TF | F | 49 | 20,83 | 0,92 | 7,25 | T/G | G/G | A/G | ----- | 70,00 |
| **361** | TFG | F | 48 | 23,96 | 1,04 | 3,36 | T/T | G/G | A/A | ----- | 75,00 |
| **362** | TH | M | 64 | 18,86 | 0,25 | 14,40 | T/G | G/G | A/G | ----- | 71,00 |
| **363** | TH | M | 44 | 23,11 | 1,43 | 3,25 | T/G | G/G | A/G | ----- | 81,00 |
| **364** | TH | M | 40 | 26,16 | 1,75 | 11,75 | T/T | G/T | A/A | ----- | 89,00 |
| **365** | TI | F | 56 | 22,15 | 1,74 | 16,50 | T/G | G/T | A/G | ----- | 77,00 |
| **366** | TK | F | 58 | 18,98 | 0,89 | 18,35 | T/T | G/T | A/A | ----- | 67,00 |
| **367** | TK | F | 69 | 21,27 | 0,72 | 21,45 | G/G | G/G | G/G | ----- | 69,00 |
| **368** | TK | F | 75 | 24,11 | 1,89 | 3,18 | T/G | T/G | A/A | ----- | 76,00 |
| **369** | TK | F | 81 | 22,07 | 0,92 | 7,88 | T/T | G/G | A/A | ----- | 71,50 |
| **370** | TKT | F | 60 | 24,30 | 1,64 | 5,75 | T/T | G/T | A/A | ----- | 86,50 |
| **371** | TKY | F | 47 | 24,92 | 0,94 | 34,00 | T/G | G/T | A/G | ----- | 82,00 |
| **372** | TLNH | F | 40 | 27,86 | 1,09 | 5,50 | T/G | G/G | A/G | ----- | 80,00 |
| **373** | TM | M | 74 | 21,18 | 0,55 | 9,00 | T/T | G/T | A/A | ----- | 76,00 |
| **374** | TM | M | 66 | 21,16 | 1,81 | 26,95 | T/T | G/G | ----- | ----- | 76,00 |
| **375** | TM | M | 67 | 21,64 | 1,09 | 4,30 | T/T | G/G | A/A | ----- | 85,15 |
| **376** | TM | F | 54 | 20,65 | 1,21 | 20,00 | G/G | G/G | A/G | ----- | 67,00 |
| **377** | TMKS | F | 42 | 18,97 | 0,85 | 15,70 | T/G | G/G | A/A | ----- | 72,00 |
| **378** | TMT | F | 34 | 20,13 | 0,64 | 6,80 | T/T | T/T | A/A | ----- | 64,00 |
| **379** | TO | M | 59 | 22,75 | 1,76 | 3,00 | T/T | G/T | A/A | ----- | 81,00 |
| **380** | TS | M | 85 | 18,28 | 0,33 | 6,70 | T/G | G/T | A/G | ----- | 76,00 |

| Número | Iniciais | Sexo | Idade (anos) | IMC (kg/m²) | HOMA-R | Adiponectina (µg/ml) | T45G | G276T | A349G | Exon3 | Cintura (cm) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **381** | TT | F | 48 | 19,17 | 0,22 | 5,25 | T/G | G/G | A/G | ----- | 62,00 |
| **382** | TTN | F | 50 | 22,60 | 0,98 | 6,45 | T/G | G/T | A/G | ----- | 80,50 |
| **383** | TTT | M | 36 | 25,54 | 0,71 | 9,00 | T/T | G/T | A/A | ----- | 83,00 |
| **384** | TY | F | 85 | 20,60 | 0,48 | 14,80 | T/T | G/T | A/A | ----- | 79,50 |
| **385** | TY | M | 63 | 23,34 | 0,23 | 9,45 | T/G | G/G | A/G | ----- | 77,00 |
| **386** | TY | F | 70 | 20,45 | 1,06 | 16,65 | T/T | G/G | A/A | ----- | 65,50 |
| **387** | WST | M | 46 | 24,93 | 0,63 | 10,40 | T/T | G/G | A/A | ----- | 92,00 |
| **388** | WSY | M | 46 | 24,60 | 1,84 | 9,90 | T/T | G/G | A/A | ----- | 84,00 |
| **389** | YA | M | 75 | 24,88 | 1,44 | 5,10 | T/T | G/T | A/A | ----- | 87,50 |
| **390** | YF | F | 51 | 25,64 | 2,09 | 8,45 | T/G | G/G | A/G | ----- | 66,00 |
| **391** | YI | M | 36 | 22,57 | 1,45 | 6,20 | T/T | G/T | A/A | ----- | 83,75 |
| **392** | YI | M | 56 | 23,58 | 1,28 | 10,00 | G/G | G/G | G/G | ----- | 88,50 |
| **393** | YLOT | F | 39 | 24,03 | 1,67 | 6,20 | T/T | G/G | A/A | ----- | 75,00 |
| **394** | YM | F | 82 | 24,60 | 1,26 | 27,50 | T/G | G/T | A/G | ----- | 84,00 |
| **395** | YM | M | 59 | 26,39 | 0,72 | 7,55 | T/T | G/G | A/A | ----- | 99,00 |
| **396** | YM | F | 48 | 19,79 | 1,57 | 6,95 | T/G | G/G | A/G | ----- | 72,00 |
| **397** | YN | F | 83 | 20,93 | 1,73 | 22,80 | T/G | G/T | A/G | ----- | 83,00 |
| **398** | YO | F | 71 | 18,24 | 0,65 | 16,00 | T/T | T/T | A/A | ----- | 58,00 |
| **399** | YT | F | 58 | 21,27 | 1,06 | 10,50 | T/G | G/G | A/G | ----- | 65,00 |
| **400** | YY | F | 55 | 22,81 | 1,92 | 4,90 | T/T | G/T | A/A | ----- | 75,00 |

**Tabela 5:** Características demográficas, antropométricas e laboratoriais dos indivíduos portadores de DM (em vermelho, os propósitos carreadores da mutação p.Gly63ValfsX106) (Artigo 3).

| Número | Iniciais | Sexo | Idade (anos) | IMC (kg/m²) | HOMA-R | Adiponectina (µg/ml) | Cintura (cm) | HDL (mg/dl) | Triglicérides (mg/dl) |
|---|---|---|---|---|---|---|---|---|---|
| **1** | AG | M | 77 | 26,1 | 2,49 | 7,45 | G/G | G/G | A/G |
| **2** | AI | M | 66 | 24,6 | 1,81 | 22,50 | 87,50 | 50 | 370 |
| **3** | AI | M | 58 | 28,3 | 2,23 | 1,00 | 97,50 | 42 | 680 |
| **4** | AIK | M | 35 | 33,2 | 8,94 | 3,45 | 104,00 | 64 | 825 |
| **5** | AM | F | 59 | 30,1 | 2,87 | 6,00 | 93,50 | 52 | 346 |
| **6** | AMI | F | 44 | 22,9 | 1,78 | 3,15 | 78,00 | 51 | 107 |
| **7** | AN | M | 56 | 23,9 | 6,87 | 2,20 | 87,75 | 39 | 182 |
| **8** | AS | F | 65 | 22,6 | 2,49 | 12,30 | 69,00 | 58 | 182 |
| **9** | AS | M | 42 | 38,0 | 7,99 | 5,30 | 118,50 | 56 | 83 |
| **10** | AS | M | 50 | 27,8 | 5,29 | 2,60 | 100,00 | 75 | 1521 |
| **11** | AS | F | 53 | 28,0 | 11,46 | 7,91 | 86,00 | 83 | 1058 |
| **12** | AST | M | 50 | 28,0 | 4,74 | 7,20 | 92,00 | 45 | 344 |
| **13** | ATI | M | 50 | 35,2 | 10,27 | 3,95 | 109,00 | 64 | 305 |
| **14** | ATN | M | 55 | 26,3 | 3,67 | 4,85 | 88,50 | 41 | 419 |
| **15** | BM | F | 71 | 22,7 | 2,36 | 9,95 | 89,00 | 57 | 325 |
| **16** | CAK | F | 65 | 24,5 | 1,82 | 1,40 | 82,00 | 42 | 301 |
| **17** | CEY | F | 65 | 23,4 | 4,44 | 5,50 | 76,00 | 51 | 166 |
| **18** | CHN | F | 66 | 24,8 | 9,62 | 7,95 | 78,50 | 36 | 349 |
| **19** | CMK | M | 56 | 25,6 | 6,27 | 3,25 | 86,00 | 48 | 76 |
| **20** | CU | M | 58 | 27,1 | 2,01 | 1,70 | 91,00 | 44 | 491 |
| **21** | EA | F | 72 | 25,1 | 1,09 | 5,95 | 95,10 | 51 | 90 |
| **22** | EA | F | 64 | 25,2 | 4,05 | 4,50 | 80,00 | 55 | 238 |
| **23** | EEA | F | 47 | 27,0 | 5,06 | 3,90 | 87,50 | 37 | 287 |
| **24** | EK | F | 63 | 29,9 | 10,93 | 7,20 | 89,50 | 39 | 270 |
| **25** | EK | F | 55 | 24,6 | 2,90 | 12,50 | 87,50 | 91 | 269 |
| **26** | EKS | F | 68 | 29,6 | 17,46 | 9,85 | 103,00 | 47 | 284 |
| **27** | EMFA | F | 36 | 31,8 | 3,27 | 2,55 | 89,00 | 43 | 269 |
| **28** | ENI | F | 51 | 26,9 | 3,14 | 10,55 | 87,00 | 54 | 212 |
| **29** | ESHO | F | 43 | 32,5 | 4,95 | 11,10 | 90,00 | 42 | 177 |
| **30** | ESS | M | 42 | 26,0 | 3,53 | 0,90 | 89,00 | 37 | 130 |

| Número | Iniciais | Sexo | Idade (anos) | IMC (kg/m²) | HOMA-R | Adiponectina (µg/ml) | Cintura (cm) | HDL (mg/dl) | Triglicérides (mg/dl) |
|---|---|---|---|---|---|---|---|---|---|
| **31** | EYY | F | 52 | 26,1 | 3,14 | 6,20 | 90,00 | 54 | 180 |
| **32** | FFW | F | 68 | 22,8 | 4,26 | 8,75 | 81,00 | 43 | 158 |
| **33** | FNM | M | 55 | 29,0 | 5,70 | 1,85 | 95,50 | 40 | 450 |
| **34** | FTK | M | 41 | - | 4,14 | 1,90 | - | 38 | 180 |
| **35** | FY | M | 56 | 26,8 | 13,35 | 8,40 | 90,00 | 46 | 120 |
| **36** | GMUM | F | 49 | 24,0 | 2,67 | 0,95 | 77,00 | 54 | 392 |
| **37** | GT | M | 57 | 24,8 | 4,20 | 4,90 | 91,00 | 49 | 328 |
| **38** | HF | M | 39 | 38,8 | 4,73 | 3,10 | 119,00 | 43 | 430 |
| **39** | HH | M | 50 | 27,5 | 3,56 | 2,70 | 89,00 | 46 | 631 |
| **40** | HK | M | 61 | 24,2 | 3,55 | 4,25 | 83,00 | 40 | 117 |
| **41** | HN | F | 66 | 25,3 | 2,93 | 8,50 | 84,75 | 47 | 345 |
| **42** | HO | F | 59 | 24,2 | 3,01 | 9,60 | 80,00 | 44 | 161 |
| **43** | HU | F | 62 | 30,5 | 6,62 | 3,00 | 99,00 | 53 | 157 |
| **44** | HY | F | 74 | 27,0 | 3,96 | 5,65 | 89,50 | 49 | 687 |
| **45** | HY | M | 40 | 27,5 | 5,42 | 2,55 | 87,00 | 53 | 633 |
| **46** | HYH | M | 48 | 30,8 | 5,05 | 5,05 | 101,00 | 52 | 596 |
| **47** | HYUF | F | 55 | 25,7 | 4,57 | 1,45 | 83,75 | 42 | 291 |
| **48** | IG | M | 59 | 26,9 | 4,34 | 1,75 | 90,50 | 58 | 875 |
| **49** | IH | M | 73 | 24,6 | 2,78 | 6,30 | 83,50 | 46 | 267 |
| **50** | IK | M | 53 | 30,1 | 6,29 | 2,50 | 90,50 | 44 | 35 |
| **51** | IO | M | 71 | 23,0 | 2,63 | 15,50 | 79,50 | 41 | 214 |
| **52** | ISS | F | 47 | 24,7 | 3,70 | 19,10 | 75,00 | 62 | 96 |
| **53** | JAT | M | 47 | 32,8 | 3,43 | 3,55 | 104,00 | 49 | 574 |
| **54** | JCN | M | 66 | 26,8 | 4,59 | 4,00 | 89,00 | 46 | 560 |
| **55** | JJK | M | 47 | 29,7 | 3,66 | 8,20 | 94,50 | 59 | 270 |
| **56** | JN | M | 71 | 27,7 | 4,04 | 8,50 | 98,00 | 49 | 215 |
| **57** | JN | M | 59 | 28,5 | 5,58 | 4,30 | 99,25 | 47 | 246 |
| **58** | JO | F | 64 | 32,2 | 3,44 | 11,10 | 91,00 | 45 | 177 |
| **59** | JOS | F | 39 | 36,5 | 5,62 | 2,25 | 101,00 | 47 | 359 |
| **60** | KH | F | 64 | 20,4 | 2,63 | 6,35 | 71,00 | 56 | 167 |

| Número | Iniciais | Sexo | Idade (anos) | IMC (kg/m²) | HOMA-R | Adiponectina (µg/ml) | Cintura (cm) | HDL (mg/dl) | Triglicérides (mg/dl) |
|---|---|---|---|---|---|---|---|---|---|
| **61** | KH | M | 54 | 27,0 | 6,75 | 3,50 | 86,50 | 41 | 254 |
| **62** | KH | F | 65 | 26,0 | 12,11 | 6,55 | 82,00 | 41 | 324 |
| **63** | KK | M | 41 | 34,8 | 4,17 | 8,20 | 116,00 | 41 | 146 |
| **64** | KK | M | 75 | 28,9 | 2,13 | 2,65 | 95,50 | 38 | 401 |
| **65** | KK | M | 75 | 24,1 | 3,08 | 11,50 | 90,00 | 55 | 172 |
| **66** | KK | M | 59 | 27,8 | 3,17 | 1,50 | 90,50 | 51 | 229 |
| **67** | KK | M | 51 | 35,4 | 22,47 | 1,85 | 108,50 | 42 | 422 |
| **68** | KK | M | 57 | 26,7 | 2,96 | 3,30 | 87,50 | 44 | 211 |
| **69** | KMK | F | 66 | 28,2 | 3,77 | 3,40 | 90,00 | 44 | 171 |
| **70** | KN | M | 60 | 32,8 | 4,98 | 6,60 | 103,00 | 43 | 175 |
| **71** | KSYS | F | 43 | 31,1 | 6,46 | 7,00 | 88,00 | 50 | 315 |
| **72** | KT | M | 45 | 33,3 | 22,04 | 1,45 | 111,00 | 34 | 399 |
| **73** | KT | M | 47 | 26,8 | 9,80 | 5,60 | 96,00 | 46 | 401 |
| **74** | KU | M | 53 | 28,6 | 16,71 | 1,90 | 97,00 | 43 | 345 |
| **75** | KY | F | 61 | 21,5 | 3,89 | 7,25 | 75,50 | 101 | 1815 |
| **76** | LH | F | 50 | 26,5 | 3,73 | 1,10 | 80,00 | 53 | 417 |
| **77** | LKM | F | 49 | 29,9 | 6,25 | 2,40 | 91,00 | 52 | 226 |
| **78** | LSS | F | 64 | 25,5 | 8,40 | 6,00 | 83,00 | 51 | 126 |
| **79** | LT | F | 50 | 25,8 | 2,71 | 3,20 | 85,00 | 59 | 139 |
| **80** | LU | M | 58 | 25,2 | 5,71 | 5,85 | 88,00 | 68 | 1159 |
| **81** | LY | F | 52 | 30,3 | 5,82 | 13,95 | 91,00 | 71 | 131 |
| **82** | LYK | M | 65 | 25,8 | 3,81 | 2,20 | 85,00 | 39 | 310 |
| **83** | MA | M | 35 | 28,7 | 3,64 | 3,75 | 89,00 | 38 | 205 |
| **84** | MA | M | 37 | 25,8 | 2,31 | 9,00 | 90,50 | 57 | 324 |
| **85** | MAY | F | 33 | 29,3 | 5,19 | 1,10 | 77,50 | 47 | 402 |
| **86** | MF | F | 36 | 27,4 | 2,92 | 5,70 | 84,00 | 56 | 206 |
| **87** | MFM | F | 31 | 22,2 | 14,56 | 18,00 | 70,00 | 50 | 137 |
| **88** | MH | M | 55 | 31,1 | 6,26 | 17,00 | 104,50 | 53 | 106 |
| **89** | MHG | F | 48 | 31,2 | 2,80 | 10,00 | 97,00 | 63 | 1067 |
| **90** | MHS | F | 69 | 25,8 | 2,97 | 3,60 | 95,00 | 59 | 409 |

| Número | Iniciais | Sexo | Idade (anos) | IMC (kg/m²) | HOMA-R | Adiponectina (µg/ml) | Cintura (cm) | HDL (mg/dl) | Triglicérides (mg/dl) |
|---|---|---|---|---|---|---|---|---|---|
| **91** | MHS | M | 56 | 26,3 | 3,05 | 2,65 | 91,00 | 44 | 212 |
| **92** | MJYJ | F | 43 | 27,8 | 7,00 | 3,65 | 84,00 | 48 | 161 |
| **93** | MK | F | 59 | 25,0 | 2,75 | 4,45 | 74,00 | 49 | 119 |
| **94** | MK | M | 68 | 27,9 | 2,31 | 3,75 | 100,00 | 40 | 349 |
| **95** | MK | M | 64 | 25,8 | 3,18 | 5,15 | 77,50 | 52 | 349 |
| **96** | MK | M | 49 | 25,6 | 3,18 | 30,40 | 87,50 | 47 | 210 |
| **97** | MK | F | 69 | 24,6 | 4,50 | 12,35 | 90,00 | 32 | 184 |
| **98** | MKBNS | F | 51 | 27,9 | 6,23 | 6,20 | 88,00 | 45 | 586 |
| **99** | MKG | F | 60 | 23,2 | 3,05 | 5,30 | 76,50 | 34 | 380 |
| **100** | MKK | M | 45 | 26,2 | 2,63 | 16,65 | 93,00 | 51 | 213 |
| **101** | MKT | M | 35 | 31,1 | 8,81 | 2,20 | 103,00 | 51 | 656 |
| **102** | MLFN | F | 42 | 24,8 | 3,90 | 4,55 | 75,00 | 47 | 124 |
| **103** | MM | F | 72 | 29,8 | 3,00 | 9,80 | 97,50 | 60 | 178 |
| **104** | MM | F | 50 | 27,7 | 4,94 | 4,60 | 82,00 | 52 | 213 |
| **105** | MMM | F | 47 | 24,3 | 2,91 | 5,45 | 75,50 | 38 | 257 |
| **106** | MMN | M | 41 | 23,1 | 2,67 | 9,35 | 86,00 | 46 | 226 |
| **107** | MNC | F | 58 | 25,5 | 3,91 | 2,85 | 82,00 | 42 | 256 |
| **108** | MNN | F | 74 | 23,4 | 6,88 | 5,50 | 78,00 | 43 | 134 |
| **109** | MO | F | 48 | 27,5 | 5,54 | 7,70 | 97,00 | 47 | 268 |
| **110** | MS | F | 56 | 26,0 | 4,61 | 11,00 | 84,00 | 38 | 202 |
| **111** | MT | M | 46 | 28,2 | 4,32 | 5,55 | 89,50 | 43 | 252 |
| **112** | MTJT | F | 47 | 23,2 | 2,52 | 4,35 | 80,00 | 46 | 480 |
| **113** | MTS | F | 46 | 29,9 | 3,35 | 4,00 | 92,00 | 54 | 198 |
| **114** | MTT | F | 52 | 28,0 | 9,31 | 1,10 | 91,00 | 32 | 393 |
| **115** | MTY | M | 39 | 28,9 | 2,58 | 1,60 | 91,50 | 51 | 397 |
| **116** | MY | F | 54 | 27,2 | 10,91 | 6,30 | 89,00 | 41 | 233 |
| **117** | MY | M | 49 | 29,8 | 5,09 | 1,95 | 98,00 | 47 | 539 |
| **118** | MY | F | 55 | 25,9 | 6,14 | 9,20 | 80,00 | 62 | 256 |
| **119** | MY | F | 40 | 20,9 | 4,77 | 7,10 | 74,00 | 43 | 69 |
| **120** | MYH | M | 49 | 30,9 | 2,00 | 1,95 | 98,00 | 46 | 218 |

| Número | Iniciais | Sexo | Idade (anos) | IMC (kg/m²) | HOMA-R | Adiponectina (µg/ml) | Cintura (cm) | HDL (mg/dl) | Triglicérides (mg/dl) |
|---|---|---|---|---|---|---|---|---|---|
| **121** | NF | F | 67 | 22,8 | 2,07 | 6,70 | 84,00 | 59 | 434 |
| **122** | NK | F | 60 | 31,4 | 3,20 | 5,95 | 97,50 | 34 | 270 |
| **123** | NM | F | 57 | 26,4 | 3,40 | 12,50 | 81,00 | 44 | 308 |
| **124** | NMS | F | 55 | 24,5 | 2,63 | 8,70 | 77,00 | 41 | 197 |
| **125** | NN | F | 57 | 25,0 | 2,13 | 29,00 | 78,50 | 56 | 58 |
| **126** | NSJ | M | 53 | 25,4 | 3,61 | 1,60 | 95,50 | 38 | 399 |
| **127** | NTK | M | 55 | 29,4 | 1,45 | 2,60 | 100,00 | 37 | 171 |
| **128** | NTN | F | 53 | 29,4 | 4,11 | 5,96 | 92,00 | 50 | 149 |
| **129** | OD | M | 61 | 24,7 | 4,99 | 2,90 | 87,00 | 41 | 300 |
| **130** | OM | M | 52 | 33,2 | 3,03 | 9,20 | 102,00 | 46 | 199 |
| **131** | OO | F | 58 | 23,3 | 2,58 | 8,70 | 84,00 | 38 | 61 |
| **132** | PTI | M | 47 | 28,3 | 11,87 | 4,20 | 95,00 | 126 | 1979 |
| **133** | QIK | M | 53 | 30,3 | 8,06 | 1,45 | 97,00 | 63 | 984 |
| **134** | QY | F | 47 | 34,4 | 3,41 | 11,55 | 88,00 | 47 | 211 |
| **135** | RKK | M | 32 | 28,1 | 2,65 | 1,45 | 90,00 | 40 | 291 |
| **136** | RMF | M | 38 | 27,6 | 2,07 | 1,25 | 91,00 | 41 | 197 |
| **137** | RSG | F | 32 | 22,4 | 2,38 | 7,90 | 76,00 | 49 | 96 |
| **138** | RY | F | 70 | 24,4 | 2,01 | 9,15 | 76,50 | 53 | 276 |
| **139** | SG | F | 72 | 20,8 | 3,84 | 6,65 | 69,00 | 56 | 296 |
| **140** | SH | M | 52 | 29,7 | 6,06 | 14,00 | 104,00 | 57 | 155 |
| **141** | SH | F | 68 | 32,6 | 6,72 | 10,95 | 91,00 | 49 | 149 |
| **142** | SH | M | 41 | 40,8 | 10,19 | 3,40 | 129,00 | 40 | 234 |
| **143** | SH | F | 66 | 32,8 | 2,85 | 11,80 | 94,50 | 42 | 286 |
| **144** | SH | M | 53 | 25,6 | 3,53 | 2,75 | 90,00 | 33 | 530 |
| **145** | SI | M | 52 | 23,7 | 5,19 | 3,10 | 87,00 | 50 | 208 |
| **146** | SK | F | 60 | 25,4 | 9,30 | 4,40 | 90,00 | 37 | 212 |
| **147** | SK | M | 63 | 22,5 | 2,47 | 3,00 | 86,00 | 35 | 338 |
| **148** | SK | M | 66 | 26,8 | 9,55 | 2,50 | 96,00 | 33 | 411 |
| **149** | SK | F | 50 | 31,9 | 2,62 | 25,70 | 89,00 | 60 | 138 |
| **150** | SM | F | 65 | 25,5 | 6,05 | 5,10 | 85,00 | 46 | 146 |

| Número | Iniciais | Sexo | Idade (anos) | IMC (kg/m²) | HOMA-R | Adiponectina (µg/ml) | Cintura (cm) | HDL (mg/dl) | Triglicérides (mg/dl) |
|---|---|---|---|---|---|---|---|---|---|
| **151** | SM | F | 69 | 25,1 | 2,26 | 14,40 | 82,00 | 50 | 155 |
| **152** | SM | M | 66 | 27,2 | 4,29 | 3,90 | 100,00 | 50 | 410 |
| **153** | SNA | F | 44 | 24,0 | 2,28 | 2,60 | 78,00 | 31 | 129 |
| **154** | SNF | F | 51 | 28,2 | 9,14 | 3,25 | 91,00 | 54 | 261 |
| **155** | SO | M | 54 | 21,8 | 2,91 | 5,75 | 80,00 | 41 | 161 |
| **156** | SO | M | 73 | 28,7 | 2,68 | 5,50 | 94,50 | 26 | 127 |
| **157** | SS | F | 65 | 26,4 | 2,86 | 10,65 | 92,50 | 64 | 290 |
| **158** | ST | M | 54 | 28,9 | 7,90 | 6,70 | 100,00 | 51 | 576 |
| **159** | SY | M | 48 | 24,4 | 2,15 | 2,70 | 82,00 | 45 | 105 |
| **160** | TF | M | 61 | 24,9 | 5,99 | 5,30 | 91,50 | 67 | 386 |
| **161** | TG | M | 45 | 26,2 | 3,83 | 6,70 | 96,00 | 58 | 160 |
| **162** | TGK | F | 52 | 27,8 | 5,84 | 5,40 | 88,20 | 46 | 999 |
| **163** | TH | M | 59 | 34,1 | 7,97 | 4,30 | 108,00 | 45 | 199 |
| **164** | TIM | F | 47 | 26,7 | 2,43 | 9,55 | 80,00 | 49 | 171 |
| **165** | TJCI | M | 45 | 21,5 | 3,58 | 3,80 | 85,00 | 57 | 180 |
| **166** | TK | M | 61 | 27,3 | 3,11 | 8,70 | 96,25 | 58 | 167 |
| **167** | TM | M | 62 | 26,6 | 3,29 | 1,65 | 98,00 | 50 | 159 |
| **168** | TN | F | 44 | 35,8 | 10,97 | 2,40 | 95,00 | 50 | 217 |
| **169** | TO | M | 66 | 25,5 | 2,87 | 4,45 | 89,00 | 37 | 225 |
| **170** | TOF | F | 76 | 33,7 | 2,33 | 17,00 | 104,00 | 38 | 312 |
| **171** | TS | M | 59 | 23,4 | 2,22 | 4,60 | 82,00 | 36 | 237 |
| **172** | TSY | F | 51 | 31,1 | 5,37 | 9,75 | 96,00 | 89 | 1337 |
| **173** | TT | M | 76 | 26,4 | 2,09 | 5,40 | 94,00 | 49 | 176 |
| **174** | TT | M | 74 | 32,5 | 3,22 | 9,90 | 105,00 | 39 | 185 |
| **175** | TT | M | 46 | 27,4 | 2,97 | 6,15 | 87,00 | 59 | 266 |
| **176** | TT | M | 75 | 23,7 | 4,19 | 5,27 | 84,50 | 51 | 388 |
| **177** | TTI | F | 68 | 37,9 | 3,76 | 8,00 | 95,00 | 53 | 165 |
| **178** | TTM | F | 61 | 27,2 | 5,15 | 2,77 | 86,50 | 51 | 238 |
| **179** | TTMM | F | 48 | 29,7 | 2,97 | 3,10 | 87,00 | 47 | 122 |
| **180** | TUI | F | 70 | 21,8 | 2,69 | 8,55 | 75,50 | 52 | 158 |

| Número | Iniciais | Sexo | Idade (anos) | IMC (kg/m²) | HOMA-R | Adiponectina (µg/ml) | Cintura (cm) | HDL (mg/dl) | Triglicérides (mg/dl) |
|---|---|---|---|---|---|---|---|---|---|
| **181** | TUS | F | 53 | 25,6 | 2,98 | 8,15 | 84,00 | 45 | 229 |
| **182** | TY | M | 63 | 26 | 2,65 | 0,65 | 100,00 | 44 | 351 |
| **183** | TYSJ | F | 45 | 30,0 | 7,84 | 9,90 | 94,00 | 68 | 467 |
| **184** | VM | M | 39 | 32,0 | 5,21 | 3,40 | 104,00 | 42 | 207 |
| **185** | VO | F | 70 | 24,7 | 5,24 | 10,50 | 87,00 | 53 | 803 |
| **186** | WTM | M | 45 | 27,6 | 4,89 | 3,50 | 96,00 | 41 | 477 |
| **187** | YK | M | 62 | 26,6 | 2,87 | 3,90 | 94,00 | 67 | 343 |
| **188** | YK | M | 50 | 21,5 | 2,02 | 15,50 | 84,00 | 69 | 142 |
| **189** | YK | F | 68 | 24,4 | 2,54 | 5,45 | 88,00 | 46 | 260 |
| **190** | YM | M | 62 | 30,2 | 2,26 | 5,25 | 101,00 | 42 | 239 |
| **191** | YMO | F | 62 | 22,1 | 15,90 | 11,00 | 80,00 | 55 | 90 |
| **192** | YN | M | 61 | 33,6 | 2,65 | 3,25 | 104,00 | 69 | 1036 |
| **193** | YS | F | 58 | 27,9 | 11,40 | 6,45 | 86,50 | 44 | 342 |
| **194** | YS | M | 73 | 32,0 | 2,07 | 27,50 | 102,50 | 44 | 152 |
| **195** | YT | F | 69 | 26,0 | 2,91 | 6,00 | 85,00 | 49 | 251 |
| **196** | YT | M | 56 | 32,1 | 8,30 | 2,25 | 107,00 | 45 | 423 |
| **197** | YT | F | 62 | 25,5 | 2,68 | 4,50 | 76,00 | 46 | 181 |
| **198** | YUM | F | 35 | 23,1 | 2,39 | 3,00 | 90,00 | 45 | 413 |
| **199** | YY | M | 61 | 24,5 | 2,68 | 3,45 | 92,50 | 49 | 213 |
| **200** | ZH | M | 69 | 22,2 | 3,06 | 4,75 | 85,00 | 38 | 496 |

**Tabela 6:** Características demográficas, antropométricas e laboratoriais dos indivíduos com TGN (Artigo 3).

| Número | Iniciais | Sexo | Idade (anos) | IMC (kg/m²) | HOMA-R | Adiponectina (µg/ml) | Cintura (cm) | HDL (mg/dl) | Triglicérides (mg/dl) |
|---|---|---|---|---|---|---|---|---|---|
| **201** | AB | F | 64 | 22,9 | 0,93 | 11,45 | 78,00 | 62 | 149 |
| **202** | AHT | F | 48 | 18,7 | 0,59 | 19,80 | 66,50 | 42 | 121 |
| **203** | AK | F | 47 | 25,7 | 1,96 | 7,30 | 75,50 | 38 | 158 |
| **204** | AMHT | F | 42 | 22,4 | 1,45 | 9,55 | 74,00 | 44 | 164 |
| **205** | AMO | F | 47 | 25,5 | 0,93 | 1,70 | 80,50 | 52 | 204 |
| **206** | AMY | M | 49 | 21,0 | 1,11 | 14,60 | 79,00 | 48 | 100 |
| **207** | ANO | F | 65 | 24,3 | 0,62 | 12,15 | 80,50 | 50 | 76 |
| **208** | AOS | F | 64 | 22,3 | 1,37 | 1,90 | 80,00 | 44 | 122 |
| **209** | AT | F | 68 | 21,7 | 1,07 | 6,10 | 73,00 | 65 | 126 |
| **210** | AT | M | 62 | 23,1 | 0,80 | 12,85 | 80,50 | 60 | ----- |
| **211** | ATA | M | 48 | 22,0 | 0,70 | 3,15 | 80,50 | 50 | 112 |
| **212** | ATFK | F | 40 | 15,9 | 1,46 | 12,00 | 62,00 | 41 | 158 |
| **213** | AY | F | 43 | 27,7 | 1,74 | 8,35 | 87,00 | 70 | 181 |
| **214** | AYS | M | 41 | 22,4 | 1,03 | 3,10 | 78,50 | 52 | 132 |
| **215** | CKMN | F | 37 | 31,2 | ----- | ----- | 92,00 | 89 | 235 |
| **216** | CMW | M | 43 | 25,3 | ----- | 6,85 | 83,00 | 44 | 140 |
| **217** | CNS | M | 49 | 19,4 | 0,97 | 13,20 | 77,00 | 64 | 181 |
| **218** | CS | F | 41 | 22,8 | - | 3,2 | 75,50 | 43 | 137 |
| **219** | CSK | M | 42 | 18,1 | 1,62 | 19,00 | 74,50 | 37 | 135 |
| **220** | CTTI | F | 47 | 23,9 | 0,83 | 5,25 | 77,50 | 64 | 137 |
| **221** | CU | M | 45 | 30,1 | 1,61 | 2,35 | 97,00 | 35 | 116 |
| **222** | DM | F | 58 | 23,4 | 1,96 | 8,95 | 70,50 | 55 | 78 |
| **223** | EEK | F | 39 | 18,4 | 0,52 | 3,45 | 62,00 | 54 | 76 |
| **224** | EHHT | F | 41 | 19,5 | 1,99 | 4,60 | 79,50 | 45 | 70 |
| **225** | EHI | M | 42 | 22,5 | 0,39 | 11,40 | 80,00 | 50 | 83 |
| **226** | EIG | M | 51 | 25,3 | 1,72 | 7,00 | 80,00 | 42 | 231 |
| **227** | EMG | M | 34 | 27,2 | 1,42 | 3,40 | 85,00 | 43 | 121 |
| **228** | EMI | F | 56 | 24,4 | 1,86 | 7,00 | 81,00 | 46 | 132 |
| **229** | ET | F | 61 | 24,8 | 0,73 | 9,55 | 75,00 | 51 | 173 |
| **230** | EU | F | 40 | 20,2 | 0,67 | 4,50 | 78,00 | 44 | 90 |

| Número | Iniciais | Sexo | Idade (anos) | IMC (kg/m²) | HOMA-R | Adiponectina (µg/ml) | Cintura (cm) | HDL (mg/dl) | Triglicérides (mg/dl) |
|---|---|---|---|---|---|---|---|---|---|
| **231** | EY | F | 58 | 26,2 | 0,97 | 16,35 | 78,00 | 38 | 151 |
| **232** | EY | F | 46 | 28,2 | 1,14 | 4,35 | 83,00 | 40 | 109 |
| **233** | EY | F | 51 | 23,9 | 1,04 | 10,90 | 80,00 | 48 | 99 |
| **234** | FHK | F | 35 | 22,1 | ----- | ----- | 76,00 | 36 | 85 |
| **235** | FK | F | 36 | 24,9 | 1,51 | 8,00 | 78,00 | 51 | 133 |
| **236** | FK | F | 63 | 18,9 | ----- | 22,35 | 72,00 | 57 | 222 |
| **237** | FMOO | F | 42 | 22,0 | 0,25 | 3,65 | 70,00 | 40 | 94 |
| **238** | FNG | F | 37 | 20,3 | 0,41 | 19,50 | 76,00 | 48 | 127 |
| **239** | FO | F | 55 | 20,4 | 0,86 | 5,75 | 73,00 | 44 | 293 |
| **240** | FO | F | 63 | 24,3 | ----- | 5,60 | 92,50 | 66 | 539 |
| **241** | FS | F | 68 | 20,5 | 1,54 | 10,50 | 64,00 | 53 | 184 |
| **242** | FS | M | 62 | 26,5 | 1,58 | 1,00 | 92,00 | 50 | 257 |
| **243** | FU | F | 55 | 22,4 | 3,35 | 10,40 | 70,75 | 49 | 85 |
| **244** | HA | M | 53 | 23,4 | 1,24 | 1,85 | 81,00 | 56 | 141 |
| **245** | HE | M | 70 | 23,0 | 0,43 | 6,00 | 87,00 | 79 | 177 |
| **246** | HH | F | 44 | 21,0 | ----- | 12,00 | 70,00 | 48 | 200 |
| **247** | HH | F | 50 | 26,1 | ----- | 5,00 | 85,00 | 47 | 156 |
| **248** | HI | F | 77 | 22,6 | 1,41 | 8,40 | 79,00 | 49 | 65 |
| **249** | HI | F | 54 | 24,2 | 1,16 | 13,70 | 84,50 | 43 | 147 |
| **250** | HI | F | 51 | 22,5 | ----- | 18 | 94,00 | 53 | 57 |
| **251** | HK | M | 70 | 19,7 | 0,83 | 3,20 | 78,00 | 50 | 76 |
| **252** | HKO | F | 50 | 25,2 | 1,68 | 4,25 | 84,50 | 51 | ----- |
| **253** | HKTO | F | 42 | 20,5 | 1,05 | 24,35 | 65,00 | 56 | 159 |
| **254** | HM | F | 63 | 17,5 | ----- | 20,00 | 70,75 | 70 | 81 |
| **255** | HMB | F | 52 | 23,2 | 1,29 | 3,25 | 76,50 | 60 | 301 |
| **256** | HMI | M | 44 | 23,6 | 1,65 | 6,15 | 89,10 | 49 | 125 |
| **257** | HMK | F | 49 | 23,8 | 1,69 | 6,65 | 81,00 | 48 | 200 |
| **258** | HMSSI | F | 41 | 20,6 | ----- | ----- | 73,75 | 57 | ----- |
| **259** | HN | F | 74 | 27,4 | 1,81 | 21,70 | 85,00 | 58 | 188 |
| **260** | HO | M | 72 | 23,3 | 1,48 | 5,85 | 86,00 | 64 | 147 |

| Número | Iniciais | Sexo | Idade (anos) | IMC (kg/m²) | HOMA-R | Adiponectina (µg/ml) | Cintura (cm) | HDL (mg/dl) | Triglicérides (mg/dl) |
|---|---|---|---|---|---|---|---|---|---|
| **261** | HO | M | 60 | 23,0 | 0,85 | 7,15 | 81,00 | 41 | 124 |
| **262** | HO | M | 60 | 21,0 | 1,75 | 5,60 | 77,50 | 71 | 88 |
| **263** | HS | F | 45 | 21,4 | 0,59 | 6,30 | 74,00 | 61 | 140 |
| **264** | HTG | F | 59 | 24,3 | ----- | 2,10 | 80,50 | 72 | 302 |
| **265** | HYA | F | 49 | 17,2 | ----- | 10,85 | 53,50 | 77 | 114 |
| **266** | IA | F | 59 | 21,7 | 0,27 | 13,95 | 71,00 | 71 | 68 |
| **267** | IK | M | 43 | 29,3 | ----- | ----- | 97,00 | 44 | 164 |
| **268** | IMAF | M | 40 | 27,9 | 0,61 | 1,10 | 87,00 | 54 | 385 |
| **269** | IMAF | F | 45 | 22,4 | 1,60 | 10,30 | 71,00 | 48 | 76 |
| **270** | IST | F | 63 | 18,0 | 0,69 | 4,45 | 74,50 | 54 | 237 |
| **271** | IYST | F | 33 | 23,7 | 1,24 | 19,75 | 68,00 | 58 | 49 |
| **272** | JCK | M | 35 | 24,6 | ----- | 1,26 | 81,50 | 40 | 264 |
| **273** | JHKC | F | 47 | 25,0 | 1,55 | 14,75 | 75,00 | 45 | 162 |
| **274** | JKK | F | 42 | 24,5 | 0,66 | 13,35 | 78,00 | 49 | 101 |
| **275** | JKN | M | 45 | 25,5 | 2,45 | 2,25 | 92,00 | 42 | 277 |
| **276** | JMNS | F | 44 | 22,8 | 1,83 | 8,80 | 70,00 | 49 | 220 |
| **277** | JTHS | F | 48 | 23,5 | ----- | 6,35 | 69,50 | 34 | 197 |
| **278** | JTK | M | 44 | 25,5 | 0,83 | 9,30 | 80,75 | 54 | 165 |
| **279** | JTT | M | 41 | 27,0 | 1,32 | 9,28 | 89,00 | 51 | 153 |
| **280** | KH | F | 70 | 18,6 | 0,76 | 21,25 | 63,00 | 52 | 95 |
| **281** | KH | F | 68 | 23,3 | 1,38 | 13,00 | 83,50 | 51 | 199 |
| **282** | KHK | F | 54 | 27,5 | 1,82 | 27,85 | 77,50 | 38 | 165 |
| **283** | KK | F | 75 | 27,1 | 1,28 | 10,00 | 83,25 | 46 | 425 |
| **284** | KKT | F | 51 | 22,0 | 1,69 | 10,80 | 74,50 | 38 | 135 |
| **285** | KKT | F | 79 | 20,4 | 0,43 | 12,50 | 73,50 | 41 | 76 |
| **286** | KKT | F | 86 | 21,8 | 1,19 | 24,15 | 78,00 | 63 | 127 |
| **287** | KM | M | 46 | 20,5 | 1,85 | 7,35 | 81,50 | 58 | 165 |
| **288** | KMT | F | 35 | 17,6 | ----- | 28,5 | 63,00 | 52 | 92 |
| **289** | KNI | F | 50 | 21,3 | 0,84 | 8,50 | 66,00 | 56 | 85 |
| **290** | KOY | F | 65 | 25,8 | ----- | 3,9 | 87,00 | 42 | 203 |

| Número | Iniciais | Sexo | Idade (anos) | IMC (kg/m²) | HOMA-R | Adiponectina (µg/ml) | Cintura (cm) | HDL (mg/dl) | Triglicérides (mg/dl) |
|---|---|---|---|---|---|---|---|---|---|
| **291** | KS | M | 80 | 20,7 | 0,49 | 19,50 | 80,00 | 43 | 163 |
| **292** | KT | M | 47 | 23,4 | 0,65 | 6,90 | 81,00 | 105 | 1520 |
| **293** | KY | M | 67 | 24,0 | 0,56 | 8,85 | 83,00 | 41 | 100 |
| **294** | LEIN | F | 43 | 22,5 | ----- | 11,5 | 75,00 | 61 | 135 |
| **295** | LEM | M | 43 | 22,6 | 0,63 | 2,55 | 80,00 | 44 | 129 |
| **296** | LH | M | 52 | 24,0 | ----- | 6,85 | 85,00 | 42 | 134 |
| **297** | LKO | M | 67 | 25,9 | 2,41 | 5,20 | 86,50 | 46 | 483 |
| **298** | LLIK | F | 41 | 24,1 | 1,67 | 12,90 | 80,00 | 49 | 122 |
| **299** | LMIA | F | 53 | 27,0 | 1,91 | 11,90 | 87,50 | 58 | 124 |
| **300** | LMOG | F | 34 | 21,7 | 0,83 | 11,20 | 77,00 | 58 | 333 |
| **301** | LO | M | 50 | 25,4 | 0,93 | 5,05 | 82,00 | 55 | 113 |
| **302** | LSY | F | 44 | 23,6 | 1,39 | 2,50 | 78,00 | 38 | 114 |
| **303** | LYAI | F | 56 | 21,6 | 0,18 | 11,25 | 66,00 | 50 | 135 |
| **304** | MAN | F | 35 | 25,5 | 1,33 | 8,35 | 78,00 | 43 | 160 |
| **305** | MAT | M | 34 | 24,8 | 1,57 | 2,2 | 89,00 | 42 | 90 |
| **306** | MF | F | 75 | 19,2 | 1,31 | 12,06 | 67,00 | 53 | 167 |
| **307** | MFYK | F | 36 | 23,2 | ----- | ----- | 73,00 | 52 | 93 |
| **308** | MH | F | 50 | 21,7 | 0,74 | 2,50 | 73,00 | 50 | 219 |
| **309** | MH | M | 74 | 24,6 | 0,43 | 5,60 | 85,50 | 51 | 262 |
| **310** | MH | F | 68 | 23,2 | ----- | 9,3 | 81,10 | 55 | 149 |
| **311** | MK | M | 57 | 24,3 | ----- | 1,80 | 82,00 | 32 | 115 |
| **312** | MK | M | 40 | 25,2 | 1,29 | 5,35 | 85,00 | 45 | 141 |
| **313** | MK | F | 77 | 23,6 | 1,57 | 8,15 | 73,50 | 48 | 184 |
| **314** | MKI | F | 68 | 18,5 | 0,84 | 22,30 | 65,00 | 58 | 89 |
| **315** | MKM | F | 60 | 24,1 | 1,98 | 19,05 | 77,00 | 64 | ----- |
| **316** | MLEHT | F | 47 | 25,1 | 1,07 | 7,25 | 75,00 | 52 | 68 |
| **317** | MM | F | 52 | 23,8 | 1,03 | 3,55 | 74,00 | 42 | 281 |
| **318** | MM | M | 43 | 21,8 | 1,10 | 20,00 | 80,75 | 50 | 174 |
| **319** | MM | M | 51 | 27,8 | ----- | ----- | 95,00 | 60 | 579 |
| **320** | MM | F | 74 | 18,1 | 2,12 | 12,25 | 61,00 | 44 | 125 |

| Número | Iniciais | Sexo | Idade (anos) | IMC (kg/m²) | HOMA-R | Adiponectina (µg/ml) | Cintura (cm) | HDL (mg/dl) | Triglicérides (mg/dl) |
|---|---|---|---|---|---|---|---|---|---|
| **321** | MMK | F | 51 | 26,8 | ----- | 7,75 | 87,50 | 37 | 195 |
| **322** | MMM | F | 57 | 21,5 | 0,68 | 25,00 | 71,00 | 68 | 103 |
| **323** | MMT | F | 35 | 25,4 | ----- | 6,15 | 85,00 | 38 | 123 |
| **324** | MMY | F | 44 | 20,0 | 0,48 | 17,00 | 65,00 | 48 | 114 |
| **325** | MO | M | 64 | 28,2 | 1,95 | 2,15 | 101,75 | 40 | 140 |
| **326** | MO | M | 66 | 20,1 | 0,54 | 11,25 | 72,00 | 57 | 79 |
| **327** | MOO | F | 58 | 23,3 | 1,50 | 17,55 | 75,00 | 54 | 245 |
| **328** | MOP | F | 70 | 36,1 | ----- | 6,15 | 103,40 | 59 | 326 |
| **329** | MS | F | 59 | 20,7 | 1,20 | 16,95 | 77,25 | 58 | 149 |
| **330** | MSD | F | 54 | 22,8 | 1,02 | 5,25 | 73,00 | 53 | 129 |
| **331** | MSE | F | 48 | 21,8 | 1,35 | 23,65 | 67,25 | 65 | 67 |
| **332** | MSM | F | 34 | 21,4 | 1,03 | 4,45 | 68,50 | 53 | 117 |
| **333** | MSY | F | 69 | 22,9 | ----- | 6,55 | 78,50 | 55 | 151 |
| **334** | MT | F | 54 | 20,1 | 0,64 | 5,85 | 71,00 | 60 | 195 |
| **335** | MT | M | 66 | 20,8 | 1,54 | 6,30 | 82,00 | 43 | 223 |
| **336** | MTI | F | 69 | 25,3 | 1,20 | 22,50 | 85,50 | 65 | 320 |
| **337** | MTSR | F | 41 | 22,6 | 1,39 | 6,90 | 71,50 | 39 | 120 |
| **338** | NA | F | 34 | 22,3 | 0,94 | 4 | 74,00 | 58 | 77 |
| **339** | NA | F | 60 | 22,8 | ----- | 16,65 | 88,25 | 57 | 509 |
| **340** | NF | F | 41 | 20,2 | 1,56 | 7,85 | 66,75 | 38 | 164 |
| **341** | NF | M | 34 | 21,6 | 1,50 | 6,70 | 79,50 | 50 | 232 |
| **342** | NH | M | 66 | 28,1 | 1,20 | 3,00 | 93,50 | 40 | 209 |
| **343** | NID | F | 59 | 24,6 | 1,59 | 13,50 | 74,50 | 39 | 96 |
| **344** | NK | F | 52 | 22,7 | 1,66 | 15,70 | 74,00 | 51 | 88 |
| **345** | NM | M | 77 | 24,8 | ----- | 4,75 | 87,00 | 43 | 210 |
| **346** | NM | M | 45 | 24,6 | 1,97 | 2,40 | 88,00 | 70 | 110 |
| **347** | NNM | F | 47 | 22,7 | 0,60 | 26,80 | 72,00 | 41 | 69 |
| **348** | NO | F | 43 | 18,8 | 1,44 | 15,00 | 64,00 | 54 | 56 |
| **349** | NO | M | 69 | 26,2 | 1,07 | 7,80 | 98,50 | 36 | 133 |
| **350** | NUS | F | 69 | 26,5 | 1,35 | 16,50 | 83,00 | 44 | 75 |

| Número | Iniciais | Sexo | Idade (anos) | IMC (kg/m²) | HOMA-R | Adiponectina (µg/ml) | Cintura (cm) | HDL (mg/dl) | Triglicérides (mg/dl) |
|---|---|---|---|---|---|---|---|---|---|
| **351** | OAY | M | 36 | 22,8 | 0,83 | 6,75 | 81,00 | 45 | 158 |
| **352** | OOF | F | 62 | 23,9 | 1,58 | 20,65 | 77,00 | 66 | 94 |
| **353** | OSIK | F | 49 | 28,5 | 1,59 | 9,10 | 89,00 | 44 | 125 |
| **354** | PMS | M | 47 | 22,8 | 1,89 | 3,25 | 79,50 | 61 | 451 |
| **355** | | | | | | | | | |
| **356** | RAM | M | 39 | 23,6 | 0,77 | 7,90 | 86,50 | 52 | 104 |
| **357** | RFU | F | 57 | 25,1 | 0,88 | 3,7 | 80,50 | 44 | 223 |
| **358** | RMHC | F | 43 | 23,9 | 1,68 | 5,80 | 70,50 | 52 | 118 |
| **359** | RNM | M | 33 | 26,3 | 1,27 | 4,75 | 83,50 | 45 | 189 |
| **360** | RY | F | 33 | 17,5 | ----- | 8,1 | 74,00 | 33 | 124 |
| **361** | SAUT | F | 42 | 26,3 | 1,81 | 7,65 | 79,00 | 46 | 116 |
| **362** | SE | F | 51 | 21,9 | 1,03 | 18,50 | 75,25 | 41 | 66 |
| **363** | SH | F | 67 | 18,8 | 0,49 | 6,91 | 64,50 | 51 | 135 |
| **364** | SHK | M | 40 | 21,3 | 1,13 | 17,00 | 80,00 | 55 | 288 |
| **365** | SIN | F | 59 | 21,8 | 0,49 | 17,00 | 71,00 | 61 | 113 |
| **366** | SK | F | 50 | 22,7 | 2,20 | 6,30 | 77,00 | 37 | 228 |
| **367** | SK | M | 71 | 20,5 | 0,81 | 19,30 | 70,75 | 67 | 86 |
| **368** | SKT | F | 50 | 17,9 | 0,60 | 16,00 | 60,00 | 50 | 133 |
| **369** | SM | M | 39 | 24,6 | 2,02 | 4,65 | 79,00 | 45 | 156 |
| **370** | SM | F | 64 | 25,0 | 1,56 | 13,50 | 84,00 | 65 | 109 |
| **371** | SM | F | 62 | 32,3 | ----- | 11,45 | 101,00 | 47 | 250 |
| **372** | SMA | M | 44 | 23,4 | ----- | ----- | 80,00 | 47 | 234 |
| **373** | SMMA | F | 36 | 24,0 | 1,18 | 21,50 | 77,00 | 50 | 68 |
| **374** | SN | F | 54 | 21,6 | 1,54 | 6,35 | 70,00 | 43 | 111 |
| **375** | SN | M | 55 | 22,0 | 0,99 | 8,05 | 74,00 | 34 | 150 |
| **376** | SN | M | 74 | 24,3 | 0,74 | 20,35 | 94,50 | 57 | 140 |
| **377** | SNM | F | 49 | 26,9 | ----- | 15,00 | 80,50 | 42 | 222 |
| **378** | SO | M | 65 | 19,7 | 0,80 | 6,20 | 77,00 | 55 | 155 |
| **379** | SO | M | 51 | 23,1 | 1,54 | 1,6 | 86,50 | 41 | 318 |
| **380** | SS | F | 69 | 19,2 | 1,57 | 24,10 | 69,50 | 51 | 162 |

| Número | Iniciais | Sexo | Idade (anos) | IMC (kg/m²) | HOMA-R | Adiponectina (µg/ml) | Cintura (cm) | HDL (mg/dl) | Triglicérides (mg/dl) |
|---|---|---|---|---|---|---|---|---|---|
| **381** | SSKN | F | 35 | 20,4 | 1,09 | 5,45 | 64,50 | 60 | 107 |
| **382** | SSN | F | 80 | 22,7 | 1,07 | 21,00 | 82,25 | 44 | 130 |
| **383** | SSS | F | 34 | 22,6 | 1,33 | ----- | 73,00 | 51 | 205 |
| **384** | SST | F | 54 | 21,2 | 1,65 | 9,90 | 74,50 | 87 | 100 |
| **385** | ST | F | 86 | 22,1 | 0,60 | 12,70 | 87,00 | 62 | 185 |
| **386** | SU | F | 60 | 21,6 | 0,98 | 21,00 | 79,50 | 62 | 141 |
| **397** | SWK | F | 60 | 23,9 | 1,16 | 12,80 | 78,00 | 47 | ----- |
| **388** | TF | M | 64 | 19,4 | 1,71 | 16,00 | 76,00 | 60 | 64 |
| **389** | TF | F | 49 | 20,8 | 0,92 | 7,25 | 70,00 | 49 | 83 |
| **390** | TFG | F | 48 | 24,0 | 1,04 | 3,36 | 75,00 | 56 | 62 |
| **391** | TH | M | 64 | 18,9 | 0,25 | 14,40 | 71,00 | 55 | 130 |
| **392** | TH | M | 44 | 23,1 | 1,43 | 3,25 | 81,00 | 39 | 174 |
| **393** | TH | M | 40 | 26,2 | 1,75 | 11,75 | 89,00 | 51 | 596 |
| **394** | TI | F | 56 | 22,1 | 1,74 | 16,50 | 77,00 | 61 | 120 |
| **395** | TK | F | 58 | 19,0 | 0,89 | 18,35 | 67,00 | 50 | 172 |
| **396** | TK | F | 69 | 21,3 | 0,72 | 21,45 | 69,00 | 63 | 130 |
| **397** | TK | F | 81 | 22,1 | 0,92 | 7,88 | 71,50 | 53 | 134 |
| **398** | TK | F | 50 | 19,4 | ----- | 9,7 | 73,50 | 55 | 194 |
| **399** | TK | F | 75 | 24,1 | 1,89 | 3,18 | 76,00 | 54 | 108 |
| **400** | TKT | F | 60 | 24,3 | 1,64 | 5,75 | 86,50 | 58 | 181 |
| **401** | TLNH | F | 40 | 27,9 | 1,09 | 5,50 | 80,00 | 50 | 271 |
| **402** | TM | M | 74 | 21,2 | 0,55 | 9,00 | 76,00 | 35 | 174 |
| **403** | TM | M | 66 | 21,2 | 1,81 | 26,95 | 76,00 | 47 | 65 |
| **404** | TM | M | 67 | 21,6 | 1,09 | 4,30 | 85,15 | 45 | 164 |
| **405** | TM | F | 54 | 20,6 | 1,21 | 20,00 | 67,00 | 84 | 126 |
| **406** | TM | F | 66 | 31,4 | ----- | 10,5 | 97,00 | 45 | 108 |
| **407** | TMK | F | 34 | 20,1 | 0,64 | 6,80 | 64,00 | 48 | 88 |
| **408** | TMKS | F | 42 | 19,0 | 0,85 | 15,70 | 72,00 | 32 | 74 |
| **409** | TN | M | 63 | 21,7 | ----- | ----- | 80,00 | 34 | 172 |
| **410** | TNH | F | 65 | 21,8 | 1,45 | 10,7 | 74,00 | 41 | 117 |

| Número | Iniciais | Sexo | Idade (anos) | IMC (kg/m²) | HOMA-R | Adiponectina (µg/ml) | Cintura (cm) | HDL (mg/dl) | Triglicérides (mg/dl) |
|---|---|---|---|---|---|---|---|---|---|
| **411** | TO | M | 59 | 22,8 | 1,76 | 3,00 | 81,00 | 39 | 186 |
| **412** | TS | M | 85 | 18,3 | 0,33 | 6,70 | 76,00 | 53 | 177 |
| **413** | TSS | M | 36 | 17,7 | 0,54 | 15,75 | 67,00 | 46 | 91 |
| **414** | TT | F | 48 | 19,2 | 0,22 | 5,25 | 62,00 | 52 | 80 |
| **415** | TTH | F | 46 | 25,6 | ----- | ----- | 81,00 | 50 | 148 |
| **416** | TTN | F | 50 | 22,6 | 0,98 | 6,45 | 80,50 | 46 | 120 |
| **417** | TTN | F | ‘70 | 26,8 | | | 83,00 | 50 | 150 |
| **418** | TTT | M | 36 | 25,5 | 0,71 | 9,00 | 83,00 | 39 | 236 |
| **419** | TTY | F | 47 | 24,9 | 0,94 | 34,00 | 82,00 | 52 | 59 |
| **420** | TY | F | 85 | 20,6 | 0,48 | 14,80 | 79,50 | 55 | 186 |
| **421** | TY | M | 63 | 23,3 | 0,23 | 9,45 | 77,00 | 41 | 141 |
| **422** | TY | F | 70 | 20,4 | 1,06 | 16,65 | 65,50 | 53 | 455 |
| **423** | VKO | M | 46 | 27,7 | ----- | ----- | 92,00 | 48 | 436 |
| **424** | WST | M | 46 | 24,9 | 0,63 | 10,40 | 92,00 | 65 | ----- |
| **425** | WSY | M | 46 | 24,6 | 1,84 | 9,90 | 84,00 | 42 | 379 |
| **426** | YA | M | 75 | 24,9 | 1,44 | 5,10 | 87,50 | 50 | 162 |
| **427** | YF | F | 51 | 25,6 | 2,09 | 8,45 | 66,00 | 37 | 166 |
| **428** | YI | M | 36 | 22,6 | 1,45 | 6,20 | 83,75 | 40 | 63 |
| **429** | YI | M | 56 | 23,6 | 1,28 | 10,00 | 88,50 | 38 | 98 |
| **430** | YKY | F | 60 | 23,0 | 1,05 | 9,15 | 77,00 | 61 | 129 |
| **431** | YLOT | F | 39 | 24,0 | 1,67 | 6,20 | 75,00 | 50 | 184 |
| **432** | YM | F | 82 | 24,6 | 1,26 | 27,50 | 84,00 | 56 | 159 |
| **433** | YM | M | 59 | 26,4 | 0,72 | 7,55 | 99,00 | 41 | 213 |
| **434** | YM | F | 48 | 19,8 | 1,57 | 6,95 | 72,00 | 61 | 220 |
| **435** | YM | F | 71 | 23,4 | ----- | ----- | 76,75 | 59 | 183 |
| **436** | YN | F | 83 | 20,9 | 1,73 | 22,80 | 83,00 | 61 | 273 |
| **437** | YO | F | 71 | 18,2 | 0,65 | 16,00 | 58,00 | 53 | 98 |
| **438** | YT | F | 58 | 21,3 | 1,06 | 10,50 | 65,00 | 51 | 97 |
| **439** | YT | M | 59 | 25,4 | ----- | 1,45 | 83,50 | 38 | 183 |
| **440** | YY | F | 55 | 22,8 | 1,92 | 4,90 | 75,00 | 44 | 184 |

**Tabela 7:** Características demográficas, antropométricas, grau de tolerância à glicose, HOMA-R e níveis de adiponectina plasmática dos indivíduos carreadores da mutação p.Gly63ValfsX106 (Artigo 3).

| Iniciais | Sexo | Idade (anos) | Toler. glicose | IMC (kg/m²) | HOMA-R | Adiponectina (µg/ml) | Cintura (cm) | HDL (mg/dl) | Triglicérides (mg/dl) |
|---|---|---|---|---|---|---|---|---|---|
| **AN** | F | 54 | DM | 28,2 | 8,10 | 1,05 | 91,50 | 44 | 186 |
| **AN** | M | 56 | DM | 23,9 | 6,87 | 2,20 | 87,75 | 39 | 182 |
| **CA** | M | 25 | TGN | 20,6 | 0,82 | 0,70 | 67,00 | 51 | 60 |
| **MA** | M | 56 | DM | 22,9 | 1,25 | 0,60 | 85,00 | 75 | 759 |
| **MA** | M | 26 | TGN | 26,3 | 1,08 | 1,65 | 84,00 | 53 | 70 |
| **TA** | M | 14 | TGN | 22,3 | 1,27 | 0,95 | 68,00 | 37 | 74 |
| **TY** | M | 63 | DM | 26 | 2,65 | 0,65 | 100,00 | 44 | 351 |
| **YAS** | F | 50 | DM | 20,8 | 3,13 | 0,55 | 81,00 | 49 | 212 |

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