# 139 - INFLUENCE OF VARIABLES ANTHROPOMETRIC IN THE BIOCHEMICAL MARKERS OF THE DIABETES TYPE 2

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**Introduction**

Type 2 diabetes is the most common form of diabetes. It is characterized by disorders of insulin action and insulin secretion, either of which may be the predominant feature. Usually, both are present at the time diabetes becomes clinically manifest.

Patients with type 2 diabetes usually have insulin resistance and relative, rather than absolute, insulin deficiency. At the time of diagnosis of diabetes, and often throughout their lifetimes, these patients do not need insulin treatment to survive, although ultimately many require it for glycemic control. This form of diabetes is associated with progressive ß-cell failure with increasing duration of diabetes

**General Objectives**

The objective of study was to detect the relationship of anthropometric measures and biochemistry levels of Insulin Resistance of type 2 diabetes.

**Methodology**

**Subjects and Sample**

Patients with type 2 diabetes that spontaneously looked for the Diabetes Ambulatory of Goiânia General Hospital, who were in use of only one antidiabetic drug. The sample was of 69 patients with age between 38 and 79 years (54,06 ± 9.24), 51 women and 18 men.

**Proceedings**

The study was approved by Study and Ethics Committee of Goiânia General Hospital

All patients signed Informed Consent

We analyzed the chronological age, sex, time from diagnostic of type 2 diabetes, time of interruption of antidiabetic drug, anthropometric measures of waist and hip, glycemia, glicated hemoglobin (HbA1c), HDL-Cholesterol and Uric Acid.

All patients interrupted the use of antidiabetic drug at least 2 weeks before the serum sample collection.

The normal reference of waist and hip was defined in accordance of WHO panel (1997). For men normal waist<80 and for women abdominal waist<94; waist to hip relation <1,00 and <0,85 for women. Statistical analyses were performed in SPSS software; linear regression was used to identify the association between anthropometric measures and biochemistry analyses.

**Results and Discussion**

We present the clinical, anthropometric and biochemistry profile of 69 patients with type 2 diabetes. The age was 59,06 ± 9,24 years, 51 women and 18 men. The time of type 2 diabetes was 5,41 ± 5,55 yr (range between 1 to 28 yr). All patients were in treatment at least 6 months before the study.

When divided by sex, the waist was 99,66 ± 10,35cm for women and 102,16 ± 17,42cm to men. Rauschhuber et al. (2005) report that waist belt is an important risk factor to various chronic non-transmissible diseases. The findings of this study are important because the relationship between visceral fat and cardiovascular diseases.

Lerario et al. (2002) and Alexander et al. (2003) report that visceral fat have positive relationship with arterial hypertension systolic and diastolic and could predict better than body mass index myocardial infarct, cerebral vascular accident and type 2 diabetes.

The waist to hip ratio was higher in women (0,95 ± 7,04) and the men had ratio bellow the expected (0,6 ±6,44); 7 subjects had waist to hip ratio >1,0 in the men group. Björntorp (1997) reported that waist to hip ratio was more strongly associated to insulin resistance, this study confirm it in women.

The basal glycemia was 160,04mg/dl±38,42. HbA1c was 6,94% ± 0,9094.

The subjects had levels of HDL-Cholesterol of 39,97 mg/dl ± 6,05 and Uric Acid 5,39mg/dl ± 1,39. Niskanen et al (2006) reported that subjects with high levels of uric acid had twice the chance to develop type 2 diabetes and can be judged a biochemistry predictor of this disease.

| PARAMETERS | | N | Minimum | Maximum | Average | Standard deviation |
|---|---|---|---|---|---|---|
| Age | | 69 | 38 | 76 | 54,06 | ± 9,24 |
| How long of the disease (years) | | 69 | 1 | 28 | 5,41 | ± 5,55 |
| Waist (cm) | F* | 51 | 77,00 | 122,50 | 99,66 | ± 10,35 |
| | M** | 18 | 79,00 | 160,00 | 102,16 | ± 17,42 |
| Hip(cm) | F | 51 | 85 | 127 | 104,74 | ± 9,85 |
| | M | 18 | 82 | 160 | 106,11 | ± 16,57 |
| Waist-To-Height Ratio (WHtR) | F | 51 | ,78 | 1,12 | ,95 | ± 7,04 |
| | M | 18 | ,84 | 1,07 | ,96 | ± 6,44 |
| Basal Glycemia (mg/dl) | | 69 | 91,80 | 250,20 | 160,04 | ± 38,42 |
| Glicated Hemoglobin (mg/dl) | | 69 | 4,90 | 9,10 | 6,94 | ± ,9089 |
| HDL-Cholesterol (mg/dl) | | 69 | 28 | 50 | 39,97 | ± 6,05 |
| Uric Acid. (mg/dl) | | 69 | 2,3 | 8,4 | 5,309 | ± 1,39 |

* Feminine ** Masculine

Chart 1- Characteristics clinics, anthropometrics and the 69 patients' biochemistries with diabetes type 2.

We performed linear regression between anthropometric measures and biochemistry data. Chart 2 shows the correlation between uric acid and waist. Waist circumference is a predictor to elevation of uric acid, with r= 0,366, $r^2$= 0,134; p=0,001.

| | Waist x Uric Acid. |
|---|---|
| r | 0,366* |
| $r^2$ | 0,134 |

*p=0,001

Chart 2- correlation between uric acid and waist.

Chart 2- correlation between uric acid and waist.

We observed inexpressive relationship between hip circumference and waist to hip ratio and biochemistry levels, suggesting that neither hip circumference nor waist to hip ratio the best predictors of metabolic disorder of type 2 diabetes.

**Conclusion**

We conclude that uric acid has direct relation to waist circumference. The policies of good health include the incentive to physical activities and good alimentary habit.

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**INFLUENCE OF VARIABLES ANTHROPOMETRIC IN THE BIOCHEMICAL MARKERS OF THE DIABETES TYPE 2**

Type 2 diabetes is a chronic disease where occurs a reduction in mass of ß cell in response of a state of insulin resistance. The principal anthropometric marker of insulin resistance is waist circumference. We analyzed biochemistry data of a population of 69 patients with type 2 diabetes referred to Diabetes Service of Goiania General Hospital. The sample was formed of 51 women and 18 men, aged 38 to 79 years (54,06 ± 9,24). The biochemistry analyzed were serum glucose, HbA1c, HDL-Cholesterol and Uric Acid. Linear Regression to association analyzes between anthropometric values and biochemistry data showed direct association between abdominal circumference and serum uric acid; r = 0,366 and $r^2$ = 0,134, p = 0,001. We conclude that levels of serum uric acid correlate directly with waist circumference. Word-key: Waist; Hip; Type 2 diabetes, uric acid.

**INFFLUENCE DE LA CEINTURE ET HANCHES DANS LES INDICATEURS BIOCHIMIQUES DE LA DIABETES MELLITUS TYPE 2**

La diabetes type 2 est une maladie chronique caracterisée par la réduction de la quantité de celules B en réponse a la resistence insulinique. Le principal indicateur antropometrique de la resistence insulinique est la ceinture abdominale. Nous avons analysé des paramètres biochimiques dans une population de 69 patients, avec diabetes type 2 qui ont consulté une polyclinique du service d´endocrinologie de l´Hôpital Général de Goiânia. L échantillon a été constitué par 51 femmes et 18 hommes, âgés entre 38 et 79 ans ( 54,06± 9,24). Les dosages biochimiques ont été : glicemie, HbA1c, HDL- Colesterol et Acide Urique . Ceux-ci ont été réalisés dans le laboratoire COVANCE, Atlanta-US. On a utilisé la regression lineale, pour analyser l´association entre les variables antropometriques et les paramètres biochimiques, et celle-ci démontre une association directe entre la ceinture abdominale et la concentration sérique de acide urique, r= 0,366 ; $r^2$ ;0,134,p=0,001. On infère que les niveaux d´acide urique ont un rapport direct avec la ceinture abdominale. Mots clé : Ceinture, Hanches ; diabetes mellitus, acide urique

**INFLUENCIA DE LA CINTURA Y DE LA CADERA EN LOS MARCADORES BIOQUIMICOS DE LA DIABETES MELLITUS TIPO 2**

La diabetes tipo 2 es una enfermedad crónica caracterizada por una reducción de la masa de células ß en respuesta a la resistencia insulínica. El principal marcador antropométrico de la resistencia insulínica es la cintura abdominal. Analisamos parámetros bioquimicos en una población de 69 pacientes, con diabetes tipo 2 , que consultaron una policlínica del servicio de endocrinología del Hospital General de Goiânia. La muestra fué constutuída por 51 mujeres y 18 hombres, con edades entre 38 y 79 años (54,06 ± 9,24). Los análisis bioquímicos fueron: glicemia, HbA1c, HDL-Colesterol y Acido Urico, los cuales fueron realizados en el laboratorio COVANCE, en Atlanta-US. Se utilizó regresión lineal para analisar la asociación entre las variables antropométricas y los parámetros bioquímicos, demostrando una asociación directa entre la cintura abdominal y la concentración sérica de ácido úrico, r= 0,366; $r^2$; 0,134; p=0,001. Concluimos que los niveles de ácido úrico tienen una relación directa con la cintura abdominal.
Palavras llave: Cintura; cadera: diabetes mellitus, ácido úrico.

**INFLUÊNCIA DE VARIÁVEIS ANTROPOMÉTRICAS NOS MARCADORES BIOQUÍMICOS DA DIABETE TIPO 2**

Diabetes tipo 2 é enfermidade crônica, caracterizada por diminuição da massa de células ß em resposta a resitência insulínica. O principal marcador antropométrico da resistência insulínica é a cintura abdominal. Nós analisamos dados bioquímicos de uma população de 69 pacientes portadores de diabetes tipo 2, que procuraram o ambulatório do Serviço de Endocrinologia do Hospital Geral de Goiânia. A amostra foi constituída por 51 mulheres e 18 homens, com idade entre 38 e 79 anos (54,06 ± 9,24). As dosagens bioquímicas constituíram-se de Glicemia, HbA1c, HDL-Colesterol e Ácido Úrico, realizados no Laboratório COVANCE, em Atlanta-US. Regressão Linear para análise de associação entre variáveis antropométricas e dados bioquímicos mostrou associação direta entre cintura abdominal e concentração sérica de ácido úrico, r= 0,366; $r^2$; 0,134; p=0,001. Concluímos que os níveis de ácido úrico relacionam-se diretamente com a cintura abdominal.
Palavras-chave: Cintura; Quadril; diabetes mellitus, ácido úrico.