



## EPIDEMIOLOGICAL AND CLINICAL PROFILE OF ACCOMPANIED PATIENTS IN A MODEL PROGRAM FOR ATTENTION TO CHRONIC CONDITIONS

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### ABSTRACT

**Objective:** To identify the epidemiological and clinical profile of patients with chronic diseases, assisted by the Model Program for Attention to Chronic Conditions in a Health Region Department in the Southwest of Paraná. **Methods:** This is a descriptive, cross-sectional study with a quantitative approach. For data collection, a form developed by the researchers was used, in addition to measuring data related to the conditions of the chronic disease, such as biochemical, clinical and demographic profile. **Results:** The sample consisted of 263 patients, mostly female, but all the patients observed had a high cardiometabolic risk, with an emphasis on the male gender regarding some biochemical variables. **Conclusion:** The majority of patients affected by chronic conditions in this research are female, with an emphasis on high cardiometabolic risk. However, there is an increased risk in males, when glucose tolerance, total cholesterol and low density lipoprotein are considered.

**Keywords:** Chronic Disease. Epidemiologic Factors. Biomarkers.

### INTRODUCTION

Chronic diseases (CD) include cardiovascular, respiratory, renal and endocrine pathologies, in addition to neoplasms<sup>(1)</sup>. The most incident and with substantial morbidity and mortality rates are hypertension, diabetes and chronic kidney disease<sup>(2)</sup>.

In the epidemiological context both in Brazil and in the world, the increase in the rate of CD is associated with several factors, such as increased life expectancy, development of new diagnostic and therapeutic methods, as well as changes in lifestyle, which can influence the profile of illness of the population, since in the last decades it has become the main cause of deaths. In 2014 alone, more than 50% of deaths in the world population aged 30 to 69 years-old were due to CD<sup>(3,4)</sup>.

CD are present in all age groups, but especially in individuals with advanced age, as many of them are related to the aging process, mainly due to cardiovascular and metabolic involvement, such as diabetes mellitus, arterial hypertension and chronic kidney disease<sup>(1)</sup>. The increase in complications of the circulatory system such as systemic arterial hypertension (SAH), in addition to diabetes, also increases the pre-availability of dysfunction of the renal system, especially chronic kidney disease (CKD). Currently, more than two million CKD patients are estimated in Brazil. Of these, 100 thousand are dependent on renal replacement therapy<sup>(3)</sup>.

In addition, CD predispose to stroke, acute myocardial infarction and metabolic syndrome, which are considered public health problems worldwide and cost 11% of the total amount

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invested in the health of the adult population<sup>(4)</sup>.

In this sense, primary health care center (PHC) has the premise of implementing health care and promotion within the scope of the Unified Health System (Sistema Único de Saúde -SUS), with actions that must monitor and treat patients with CD. Thus, the state of Paraná subsidizes and the municipalities, through inter-municipal health consortia, execute the Model Program for Attention to Chronic Conditions (MACC). Effective since 2017 as a health program, it operates in a health care network with specific care guidelines for people with diabetes mellitus (DM), systemic arterial hypertension (SAH) and chronic kidney disease<sup>(3)</sup>.

The team's strategic development actions and improvement programs must be in accordance with the level of expected results, starting in primary care with adequate risk and care stratification, in secondary care with network care lines and multidisciplinary care with the MACC, and in tertiary care in cases of complications and referral of urgency and emergency<sup>(1,3-5)</sup>.

So, what does the epidemiological profile, clinical changes and biochemical profile of patients with CD consist of at the MACC of a Health Region Department in the southwest of Paraná? Thus, this research aimed to trace the epidemiological profile, clinical changes and biochemical profile of patients with CD, receiving care at the MACC of a Health Region Department in the southwest of Paraná.

## METHODS

This is a descriptive, cross-sectional study with a quantitative approach, carried out with 263 patients being monitored by the MACC, from a Regional Health Department in Paraná, between the months of June and July 2019. The probabilistic sample by sample calculation with an interval of 95% confidence and 5% sampling error was made up of chronic renal, hypertensive and/or diabetic patients who agreed to participate in the research by signing the Free and Informed Consent Form (ICF).

There were a total of 635 patients. From these ones, 263 were evaluated and included in the survey at random, according to daily care. Such

patients already had a diagnosis of chronic conditions, that is, they are inserted into the program through a stratification performed at PHC.

During data collection, the patients were invited to participate in the research during the initial screening. After acceptance, the form was applied individually, in an exclusive room. For data collection, a form developed by the authors was used, consisting of 26 variables referring to sociodemographic data, anthropometric data, lifestyle habits, clinical data, morbidities, complications and biochemical tests. A pilot test was carried out with 10 individuals selected at random, in order to define their applicability and effectiveness.

The blood pressure measurement performed during the screening was in accordance with the methodology adopted by the 7th Brazilian Guideline for Hypertension<sup>(6)</sup>, using a hand-held sphygmomanometer regularly calibrated and certified by the National Institute of Metrology, Quality and Technology (Inmetro) and stethoscope double lumen. The parameters were classified into five subcategories, with pressure values of  $\leq 120$  -  $\leq 80$ , prehypertension 121/139 - 81/89, SAH stage I: 140/159 - 90/99, SAH stage II: 160/179 being normal - / 109, SAH stage III:  $\geq 180$  -  $\geq 110$ , thus indicating the staging of arterial hypertension<sup>(1)</sup>.

The body mass index (BMI) was obtained by dividing weight by height squared. To determine body weight, patients were arranged standing in the center of the digital scale platform, with feet and upper limbs aligned with the body. Height was verified using a stadiometer attached to the scale platform, in the vertical position, with an accuracy of 0.5 cm and performed in the vertical position with the members longitudinal to the body, it was requested to remove shoes at the time of measurement.

The abdominal circumference was checked using a tape measure with an accuracy of 0.5 cm without compression or gap, at the height of the umbilical scar, at the time of the volunteer's expiration.

Data on fasting blood glucose and total cholesterol levels and low and high density fractions were extracted from laboratory tests performed in the last 30 days provided by the respondents and the blood glucose was

considered from the 2018 Diabetes Mellitus Guide Line <sup>(3)</sup> adopted by MACC, with values <100 being considered normal,  $\geq 100$  <126 impaired glucose tolerance (TDG) and  $\geq 126$  with diabetes mellitus.

For the lipid classification, the 2017 Brazilian Dyslipidemia and Atherosclerosis Prevention Directive <sup>(7)</sup> was used, following the parameters of cardiovascular risk. Thus, for total cholesterol, the serum dosage considered normal was <190 mg/dL, and from  $\geq 191$  mg/dL is high. In the evaluation of fractions, low density lipoprotein (LDL) was considered adequate to obtain values <70mg/dL and high  $\geq 70$  mg/dL,

and in the fraction of high density lipoprotein (HDL) it was considered <40 mg/low dL, and  $\geq 40$  mg/dL good.

After collection, the data were submitted to statistical treatment in the Statistical Package for Social Science® (SPSS) - version 25.0, with descriptive frequency analysis, mean and standard deviation, and chi-square test, and the level of significance adopted was  $p < 0.05$ .

The study was submitted to the Research Ethics Committee Involving Human Beings at Universidade Paranaense, which approved it under Protocol nº 3.364.082-19.

## RESULTS

**Table 1.** Results regarding the sociodemographic parameters and life habits of patients treated in a model program for the care of chronic conditions in a Regional Health Department in Paraná. Francisco Beltrão, PR, Brazil, 2019.

VARIABLES	N	%
<b>Sex</b>		
Women	155	58,9
Men	108	41,1
<b>Relationship</b>		
In a relationship	191	72,6
No relationship	72	27,4
<b>Address</b>		
Urban	158	60,1
Rural	105	39,9
<b>Education</b>		
Without study	49	18,6
1-4 years	145	55,1
$\geq 8$ years	69	26,3
<b>Income in minimum wages</b>		
< 1 minimum wage	41	15,6
1 minimum wage	158	60,1
2 minimum wages	52	19,8
>of 2 minimum wages	12	4,6
<b>Physical activity</b>		
Practicing	108	41,1
Not practicing	155	58,9
<b>Social groups</b>		
Participants	156	59,3
Not Participants	107	40,7
<b>Community Health Agent Visits</b>		
0 Visit	52	19,8
1 Visit	196	74,5
>1 Visit	15	5,8
<b>Use of Tobacco</b>		
Yes	31	1,8
No	232	88,2
<b>Use of alcohol</b>		
Yes	33	12,5
No	230	87,5
<b>Polipharmacy</b>		
No	23	8,7
Yes	240	91,3
<10 years	103	44,9
10 years	45	17,1
>10 years	99	37,7
<b>Insulin therapy</b>		
No	194	74,9
1 Year	17	6,5
>1 Year	52	19,9

The sample consisted of 263 patients, predominantly female, most of the population

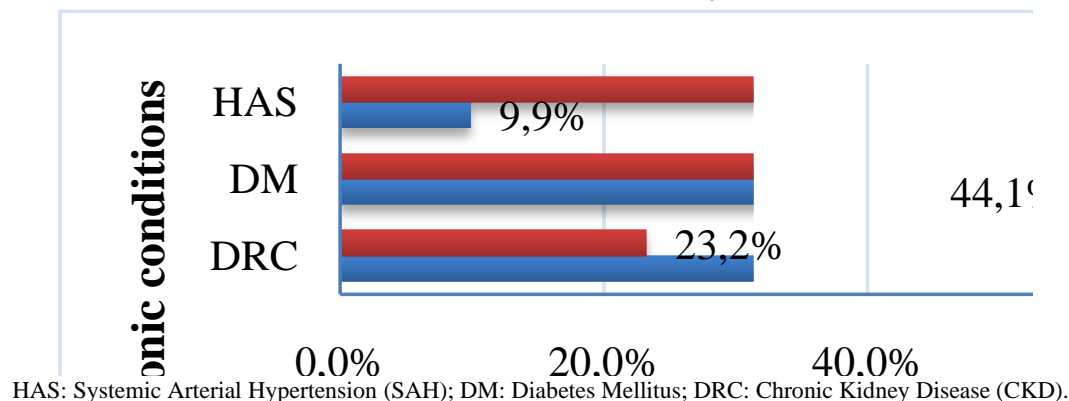
with a partner (72.6%), live in the urban area (60.1%), with up to 4 years of study (55.1%) and family income of a minimum wage (60.1%).

Regarding lifestyle, 58.9% reported not practicing physical activity and evaluated having interaction in a social group. Regarding the number of visits by the community health agent in the home environment, the majority (74.5%) received a monthly visit. And 88.2% reported they don't use tobacco and 87.5% don't use

alcohol.

However, 91.3% mentioned the daily practice of polypharmacy. Of those with less than ten years, 103 (44.9%) diverged from insulin therapy, which was not used by 197 of the patients, accounting for 74.9% of the studied population, as shown in Table 1.

Most patients have hypertension (90.1%), followed by diabetes mellitus (55.9%) and chronic kidney disease (23.2%).



**Chart 1.** Results regard to chronic diseases in patients treated in a model program of care for chronic conditions in a Health Region Department.

Regarding the time of diagnosis for SAH, the mean was  $10.6 \pm 8.98$  years. DM  $5.17 \pm 7.49$  years, and CKD  $1.37 \pm 4.3$  years.

The average age found was 63.1 years-old, and the anthropometric measurement obtained an average weight of 81.47 kg, a height of 1.62 meters, and a body mass index of 30.82, accompanied by an average waist circumference of 103.14 centimeters. Regarding the results of measuring systolic and diastolic pressure, it

was possible to obtain an average of 140.11 mmHg in the systole phase and 85.11 mmHg in the diastole, and in fasting blood glucose an average of 165.51 was obtained. mg/dL, and in the lipid profile of the volunteers, it was possible to determine the average total cholesterol set at 187, 57mg/dL, the low density lipoprotein (LDL) obtained an average of 108.2mg/dL, as for the high lipoprotein density (HDL) averaged 47.08mg/dL, as shown in Table 2.

**Table 2.** Results related to anthropometric, blood pressure and biochemical parameters of patients assisted in a model program for the care of chronic conditions in a Health Regional Department in Paraná. Francisco Beltrão, PR, Brazil, 2019.

VARIABLES	Mean
Age	63,01 anos
Body weight	81,47 Kg
Height	1,62 cm
Abdominal circumference	103,14 cm
Body mass index	30,82 m <sup>2</sup>
Systolic Blood Pressure	140,11 mmHg
Diastolic Blood Pressure	85,11 mmHg
Fasting blood glucose	165,51 mg/dL
TC: Total Cholesterol	187,57 mg/dL
LDL: Low Density Lipoprotein	108,2 mg/dL
HDL: High Density Lipoprotein	47,08 mg/dL

When associating glycemic parameters with sex, diabetes mellitus, considering fasting glucose above 126 mg/dL, prevailed in 50.6%

for women and 48.1% for men. Decreased glucose tolerance, between  $\geq 100 < 126$  was present in 19.2% of women and 28.7% of men,

and the one considered normal, with blood glucose values <100, was found in 30.1% of the female sample and 23.1% in men.

In the classification of pressure data associated with sex, most women surveyed, 28.2%, had hypertensive grade I, followed by normal pressure parameters in 25.0%. In men, the values of HAS stage I were found in 31.5% of the sample, normal pressure parameters in 24.1%, hypertensive stage II in 20.4%. When assessing the lipid profile, as for total cholesterol, women showed normal values in 65.4% of the sample, and high values in 34.6%, unlike the male sex, who obtained normal values in 48.1% and high in 51.9%. From this, the HDL values were observed, which in women was low in 35.9% and normal in 64.1%; and with regard to males, 37.0% were low and 63% normal.

Regarding LDL, which in women reached 83.3% of those surveyed with high levels and 16.7% with normal values, in men the high indexes reached 90.7% of those studied, and only 9.3% obtained an evaluation of normal LDL, as evidenced in Table 1.

When clinical parameters and gender were assessed, a similarity was observed between the triad glycemia, total cholesterol and LDL. It was possible to verify the high incidence in males, with values of 28.7% in impaired glucose tolerance, 51.9% high total cholesterol and 90.7% of the sample with high LDL. It was evident the significant association between males and impaired glucose tolerance, as well as high cholesterol, and increased LDL values, when compared to females, with  $p = 0.001$ ; 0.00 and 0.03.

**Table 3.** Results regarding the clinical and biochemical parameters of patients seen in a model program for the care of chronic conditions in a Regional Health Department in Paraná. Francisco Beltrão, PR, Brazil, 2019.

Clinical parameters	Sex				p
	Female		Male		
	N	%	N	%	
<b>Blood glucose</b>					
Normal	47	30,1	25	23,1	0,001
Decreased glucose tolerance	30	19,2	31	28,7	
Diabetes mellitus	79	50,6	52	48,1	
<b>Blood pressure</b>					
Normal	39	25,0	26	24,1	
Prehypertensive	25	16,0	15	13,9	
HAS I	44	28,2	34	31,5	
HAS II	31	19,9	22	20,4	
HAS III	17	10,9	11	10,2	
<b>Total cholesterol</b>					
Normal	102	65,4	52	48,1	0,000
High	54	34,6	56	51,9	
<b>HDL</b>					
Low	56	35,9	40	37,0	
Normal	100	64,1	68	63,0	
<b>LDL</b>					
Normal	26	16,7	10	9,3	0,003
High	130	83,3	98	90,7	

## DISCUSSION

CD are among the main pathologies that affect the adult population, intensified with senility, and in this research they have been presented more frequently in females, a result similar to a study conducted in São Paulo, where in a sample of 1333 patients, 59, 9% are women<sup>(8)</sup>. Such results are in line with the characteristic period of climacteric, which leads to a decrease in intrinsic hormonal protection, onset of signs

and symptoms of menopause, consequently loss of cardiovascular protection, resulting in an increase in chronic diseases among women<sup>(9)</sup>.

When it comes to education level, low rates are also evidenced in other studies<sup>(8,10)</sup>, it is known that low levels of education permeate social classes with less purchasing power and greater human vulnerability, interfering in quality of life and effectiveness therapeutic regimen, which can increase the CD rates<sup>(11)</sup>.

Most of the evaluated patients reported they don't do physical activities, a result compatible with those found in the national literature, demonstrated in research with chronicles of the Hiperdia Program in Brasília, in which sedentary lifestyle was found in 66% of the analyzed medical records <sup>(12)</sup>, and with the literature international study that mentions the use of the InterheartRisk Score instrument, applied to a population of more than 46 thousand Chinese, and that obtained results from insufficient practice of sports during aging <sup>(2)</sup>, which can be justified by the sarcopenia resulting from senility and disabling pathological process that lead long-lived to loss of physical fitness.

The practice of polypharmacy is massive in the long-lived population, what was observed in this research, it is worth mentioning that patients with associated comorbidities have higher rates of polypharmacy <sup>(13)</sup>. In the elderly population of Mato Grosso, 86.67% of those surveyed practiced it; however, from these ones 81.57% were women, a data compatible with the current research.

Arterial hypertension stood out substantially in the sample studied, predominantly grade I, being classified as high risk, characterized by the average presence of three cardiovascular risk factors <sup>(6)</sup>, being the chronic disease that most affects the adult population worldwide in the present changes in the patterns of population illness <sup>(2)</sup>, results similar to a study carried out in a municipality in the northwest of Paraná, in which 62.3% of the interviewees were hypertensive with high cardiovascular risk <sup>(14)</sup>. A Portuguese survey showed SAH in the 55-64 age group in 58.4% of those surveyed, and in 71.3% of the surveys in the ages between 65-74 years-old <sup>(15)</sup>, results juxtaposed with the time of diagnosis that obtained an average ten years in research with hypertensive patients of the Hiperdia de Belém Program, reinforcing the growth of chronic diseases worldwide, as well as life expectancy and associated comorbidities <sup>(16)</sup>.

Diabetes mellitus is one of the most recurrent CD <sup>(13)</sup>, and similar values were also found in a survey in India, in which fasting glycemic values averaged 223.33mg/dL, which corroborates the results of the present investigation, similar to cardiovascular disorders in 67.97% of the sample, in the same way that the average time of

diagnosis was estimated at around five years, in line with the result of this <sup>(17)</sup>.

The analysis of the incidence of RD is predominantly negative in the population studied, a result that is compatible with Cuban research, in which in a sample of 80,117 inhabitants, 9.63% were diagnosed with pre-dialysis CKD, and the time of diagnosis was estimated in less than five years <sup>(18)</sup>. Thus, it can be justified that the concomitance of SAH, DM and obesity interferes in the worsening of CKD taking it to dialysis levels, considering the time of outpatient treatment <sup>(19)</sup>.

With the arrival and advancement of senility, there is an intensification of the occurrence of chronic diseases, focusing on individuals over the age of 60 and obese <sup>(14)</sup>, resulting from the increase in comorbidities associated with the loss of cardiovascular protection, increased rates of weight and central adiposity. Such results are also found in the international literature <sup>(20)</sup>, and directly associated with the increase in CD.

Grade I obesity is frequent in patients with CD, a data also identified in a research in Juazeiro do Norte, and 65.9% of the women in the sample were obese and over 60 years-old, as well as men long-lived was incident in 60% of the sample <sup>(21)</sup>. The increase in abdominal circumference was found in 80% of the surveys applied to patients, and these results are similar to those of the present study, which suggests the multifactorial relation of high cardiovascular risk in the combination of CD with high circumference and weight <sup>(5)</sup>.

The data in this study corroborate with scientific evidence about the high incidence of lipid mismatch among chronic ones, with a high risk classification, and when measuring the total cholesterol reached a dosage of 187.57 mg/dL, when evaluated in a non-chronic population, note that high risk is considered from 200mg/DL. However, without high risk, the compensatory mechanisms become effective, unlike the maladjustments evidenced in patients with CD, who in the presence of hypertension have a high potential for stroke, because in diabetics the lipase activity changes, substantially increasing the serum concentrations of ethers cholesterol levels, which associated with low insulin potential, further depreciate the functions of already damaged structures and organs <sup>(7, 22)</sup>.

Evaluating the low density lipoprotein fractions, equally alarming results were observed, with a high risk classification, which directly influences the deterioration of vascular structures, as well as the formation of atherosclerotic plaque and, thus, the reduction of vascular competence and factors associates may incur worsening clinical conditions.

It is also worth considering that decreased HDL indexes were found, evaluated at 47.08 mg/DL. So, it is possible to affirm harmful interference in the cardiometabolic context, since with its suppression increases the indices of low density cholesterol and diabetes, as well as the occurrence of metabolic syndrome <sup>(7)</sup>. Finally, the research results point to an association between decreased glucose tolerance, high total cholesterol levels and high LDL levels in men, consistent with the increased cardiometabolic and vascular risk in men <sup>(23)</sup>.

When referring to the provision of health care, the participation on a large scale of nursing is notorious, especially in the chronic population, who go beyond hospitalization care when playing the role of health managers and educators in primary care, with regard to the prevention and change of the population's health behavior <sup>(1)</sup>.

Thus, while nursing is one of the professional classes that are most present and close to the population in all areas of care, it is understood that health literacy is paramount, concomitant to

the development of active and humanized listening, so that in the long run enable the reduction of CD <sup>(3)</sup>.

## CONCLUSION

In the present study, high rates of CD patients were identified, in both sexes, as well as the prevalence of intrinsic and extrinsic risk factors, alarming data and of epidemiological relevance, showing aggravations of the combination of more than one chronic-degenerative pathology with considerable rates of obesity and increased waist circumference.

It was also observed that despite the prevalence of CD in the female public, when associated with risk parameters and sex, the male population have presented with greater risks, being significantly associated with sex, changes in blood glucose, LDL and HDL.

In this scenario, the strategic actions of matrix support of secondary health care are paramount, considering the new profile of postmodern population illness, in the same way that systematic epidemiological monitoring and promotion of cultural changes in health and disease are necessary, for, thus, minimizing the rates of CD and its problems.

The limitations of the study focused on low health literacy and senile behavior shown by the respondents.

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## PERFIL EPIDEMIOLÓGICO, CLÍNICO E BIOQUÍMICO DE PACIENTES ACOMPANHADOS EM UM MODELO DE ATENÇÃO ÀS CONDIÇÕES CRÔNICAS

### RESUMO

**Objetivo:** Identificar o perfil epidemiológico e clínico dos pacientes com doenças crônicas, atendidos pelo programa Modelo de Atenção às Condições Crônicas de uma Regional de Saúde do Sudoeste do Paraná. **Métodos:** Trata-se de uma pesquisa descritiva, transversal, com abordagem quantitativa. Para a coleta de dados, foi utilizado um formulário desenvolvido pelos pesquisadores, além da mensuração de dados relacionados às condições da doença crônica como perfil bioquímico, clínico e demográfico. **Resultados:** A amostra foi constituída por 263 pacientes, majoritariamente do sexo feminino, porém todos os pacientes observados apresentaram alto risco cardiometabólico, com destaque para o sexo masculino quanto a algumas variáveis bioquímicas. **Conclusão:** Os pacientes acometidos por condições crônicas nesta pesquisa são em sua maioria do sexo feminino, com destaque para alto risco cardiometabólico. Entretanto, observa-se risco aumentado no sexo masculino, quando considerados a tolerância à glicose, colesterol total e lipoproteína de baixa densidade.

**Palavras-chave:** Doenças Crônicas. Fatores Epidemiológicos. Biomarcadores.

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## PERFIL EPIDEMIOLÓGICO, CLÍNICO Y BIOQUÍMICO DE PACIENTES ACOMPAÑADOS EN UN MODELO DE CUIDADOS PARA ENFERMEDADES CRÓNICAS

### RESUMEN

**Objetivo:** identificar el perfil epidemiológico y clínico de los pacientes con enfermedades crónicas, atendidos por el programa Modelo de Cuidados para Enfermedades Crónicas de una regional del Sudoeste de Paraná. **Métodos:** se trata de una investigación descriptiva, transversal, con enfoque cuantitativo. Para la recolección de datos fue utilizado un formulario desarrollado por los investigadores, además de la evaluación de los datos relacionados con las condiciones de la enfermedad crónica como perfil bioquímico, clínico y demográfico. **Resultados:** la muestra fue compuesta por 263 pacientes, mayoritariamente del sexo femenino, pero, todos pacientes observados presentaron alto riesgo cardiometabólico, con destaque para el sexo masculino en cuanto a algunas variables bioquímicas. **Conclusión:** los pacientes que padecen de enfermedades crónicas en esta investigación son en gran parte del sexo femenino, con énfasis para el alto riesgo cardiometabólico, sin embargo, se observa riesgo aumentado en el sexo masculino cuando considerado colesterol total, tolerancia a la glucosa y lipoproteína de baja densidad.

**Palabras clave:** Enfermedades Crónicas. Factores Epidemiológicos. Biomarcadores.

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