

Profile of primary care users about the electrocardiogram service with telecardiology reports

RESUMO | Objetivo: identificar o perfil dos usuários da Atenção Primária acerca do serviço de eletrocardiograma com laudo por telecardiologia. Método: trata-se de um artigo oriundo de um trabalho de conclusão de curso (monografia), estudo descritivo, exploratório, documental, com abordagem quantitativa, realizado com 31 pacientes de um município de Minas Gerais que realizaram eletrocardiograma com laudo por telecardiologia em uma Estratégia de Saúde da Família. A busca dos dados foi realizada durante o 1º semestre de 2018, entre os meses de março e maio. Os dados foram discutidos conforme epidemiologia descritiva simples uni-variada não paramétrica e não probabilística. Resultados: houve prevalência do sexo feminino, idade média de 49,8 anos e sobrepeso. As comorbidades autorreferidas mais prevalentes foram a hipertensão e o histórico familiar. A dor torácica, queimação, pontadas, formigamento e pressão arterial descompensada foram as principais queixas para a realização do exame e o diagnóstico mais prevalente foi a normalidade. Conclusão: apesar da maior parte dos exames não terem evidenciado alterações, as variáveis socioeconômicas, metabólicas e genéticas constituem fator de risco para o desenvolvimento de doenças cardiovasculares.

Descritores: Eletrocardiograma; Telemedicina; Cardiopatias; Atenção primária a saúde.

ABSTRACT | Objective: to identify the profile of primary care users about the electrocardiogram service with telecardiology reports. Method: this is an article originated from a course conclusion work (monograph), this is a descriptive, exploratory, documentary study with a quantitative approach, conducted with 31 patients from a city from Minas Gerais who underwent electrocardiogram with telecardiology report in a Family Health Strategy. The data search was conducted during the 1st semester of 2018, between the months of March and May. The data were discussed according to simple descriptive epidemiology univariate non-parametric and non-probabilistic. Results: There was a prevalence of female gender, mean age of 49.8 years and overweight. The most prevalent self-reported comorbidities were hypertension and family history. Chest pain, burning, pricking, tingling and decompensated blood pressure were the main complaints for the exam and the most prevalent diagnosis was normality. Conclusion: despite the fact that most of the exams showed no alterations, socioeconomic, metabolic and genetic variables are risk factors for the development of cardiovascular diseases.

Descriptors: Electrocardiography; Telemedicine; Heart diseases; Primary health care.

RESUMEN | Objetivo: identificar el perfil de usuarios de atención primaria sobre el servicio de electrocardiograma con informe de telecardiología. Método: este es un artículo resultante de un trabajo de finalización de curso (monografía), estudio descriptivo, exploratorio, documental, con enfoque cuantitativo, realizado con 31 pacientes de una ciudad de Minas Gerais a los que se les realizó electrocardiograma con informe de telecardiología en una Estrategia de Salud de la Familia. La búsqueda de datos se realizó durante el 1er semestre de 2018, entre los meses de marzo y mayo. Los datos se analizaron según la epidemiología descriptiva simple uni-variante no paramétrica y no probabilística. Resultados: hubo prevalencia de sexo femenino, edad media de 49,8 años y sobrepeso. Las comorbilidades autorreferidas más prevalentes fueron la hipertensión y la historia familiar. El dolor torácico, ardor, pinchazo, hormigueo y descompensación de la presión arterial fueron las principales quejas para realizar el examen y el diagnóstico más prevalente fue la normalidad. Conclusión: aunque la mayoría de los exámenes no mostraron cambios, las variables socioeconómicas, metabólicas y genéticas constituyen un factor de riesgo para el desarrollo de enfermedades cardiovasculares.

Palabras claves: Electrocardiografía; Telemedicina; Cardiopatías; Atención primaria de salud.

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INTRODUCTION

Primary Health Care (APS - Atenção Primária à Saúde), within the legislative scope of the Unified Health System (SUS), is organized as the preferred gateway to the system. In the design of this level of care, user-centered care must respond to all the health needs of the population through an integrated, articulated system based on the construction of intersectoral work networks. (1)

The Basic Health Unit (UBS - Unidade Básica de Saúde) has its field of work considered of low density and high complexity, dealing daily with a wide variety of problems, from those generated by social ills that require intersectoral work to build responses, to those clinical situations that demand actions in which the health team itself must be articulated to respond resolutely. (2)

Telecardiology, especially the performance of electrocardiogram (ECG), allows greater attention to cardiovascular diseases (CVD), the main cause of death in Brazil. Such examination becomes an important method for investigating, verifying and managing CVD. (3)

The Minas Telecardio Project, started in 2006 in the State of Minas Gerais, provided equipment for performing digital ECG to 82 small municipalities, and digital ECG exams are approved by cardiologists in the telecardiology centers of the universities participating in the project and, in this way, providing the examination certified by a specialist at a lower cost than traditional methods. (4)

The integration between the family physician and the cardiologist in the follow-up of CVD allows for greater quality in the care provided, helping to detect criteria for referring the patient to a specialized consultation, following the therapeutic guidelines. In addition, it allows for greater closeness between professionals with the identification of



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serious cases and discussion of them, reducing referrals, requesting additional exams and finally functioning as a teaching tool in service. (5)

Cardiovascular events can be predisposed by extrinsic factors, which can be modified, and intrinsic or non-modifiable factors. Long-term lifestyle habits reflect the onset of these events, as well as the worsening of risk factors in order to increase the prevalence of comorbidities. (6-9) Therefore, the problem posed for investigation has the following guiding question: What is the profile of PHC users regarding the ECG service with a report by telecardiology?

Considering the impact of CVD and possible difficulties in accessing the ECG exam in PHC, the present study aimed to analyze the profile of PHC users regarding the ECG service with a report by telecardiology.

METHODS

Article of the monograph entitled "Perception of users of Primary Care in the Municipality of Montes Claros - MG about the electrocardiogram (ECG) service with report by telecardiology", presented to the Nursing Department of Faculdade Santo Agostinho/FASA, Montes Claros (MG), Brazil. 2018.

This is a descriptive, exploratory, documentary study with a quantitative approach, carried out in the Family Health Strategy (ESF) of the neighborhood of Vera Cruz, located in the municipality of Montes Claros, Minas Gerais, which presented the ECG service available to population. In addition to this neighborhood, other poles offered this service, which were located in the following neighborhoods of that municipality: Major Prates, Alto São João and Maracanã. The sample consisted of 31 patients, these being users of the PHC of Montes Claros, who underwent the ECG with a report in the ESF. Furthermore, the information contained in the reports of the respective patients

was used to compose the study data.

A letter of introduction and an Institutional Consent Form (ICT) were sent to the Coordination of Primary Care (AB - Atenção Básica) of the Municipal Health Department of Montes Claros (SMS/MOC) to authorize the study. The institution was duly oriented about the research guidelines, with a science signature authorizing the research. The search for data was carried out during the 1st semester of 2018 by the responsible researcher, between the months of March and May, in a Basic Health Unit where the digital ECG with report was performed.

The following inclusion criteria were adopted for participation in the study: (1) being over 18 years old; (2) residing in the municipality of Montes Claros; (3) have a medical prescription with the specified justification for performing the ECG. The study was concentrated only on the ESF Vera Cruz, considering that it was the ESF of reference for this service for the entire municipality, while the other centers that also had the service were excluded from the research because they only serve their own enrolled population. To carry out the study, a semi-structured questionnaire script was developed, which was used during the approach of users regarding the examination associated with its result. The independent variables of the research consisted of gender, mean age, anthropometric data (weight, height and BMI), comorbidities, reason (complaint, justification) and conclusion of the result.

After collection, data were stored and organized in a database using the Statistical Package for Social Science (SPSS), version 18.0®. The study findings were presented through tables prepared in Microsoft Excel®, Windows for Windows, 2013 version, containing absolute frequencies and percentages, and then submitted to descriptive analysis.

Participants were properly instructed

about the study guidelines in which they signed the Informed Consent Form (FICF) in order to authorize the research. Participants had their personal identities safeguarded, in order to ensure confidentiality and anonymity in the study.

The study followed the ethical precepts established by Resolution No. 466, of December 12, 2012, of the National Health Council (CNS), which regulates the conduct of research involving human beings. The research project was evaluated and approved by the Research Ethics Committee of the State University of Montes Claros (CEP UNIMONTES), under the embodied opinion nº 2.029.185/2017, Certificate of Presentation for Ethical Appreciation (CAAE) nº 64404716.2.0000.5146.

RESULTS

Of the analyzed tests, there was a prevalence of female patients (67,7%), general mean age of 49,8 years and overweight patients (58,1%) (Table 1). It appears that, although there is a prevalence of female patients in the study sample, males have the highest body mass index (BMI) in terms of overweight and obesity grade II classifications.

Based on the data evaluated in the examination, it was also possible to draw an epidemiological profile of these patients through the comorbidities identified on the ECG. There is a significant amount of systemic arterial hypertension (SAH) (54,8%) and the influence of family history of coronary artery disease (38,8%) on females (Table 2).

As for the indication criteria for the examination, the presence of symptoms related to chest pain, burning, stabbing, precordial tingling and decompensated SAH (25,7%). It is important to highlight the average waiting time (AWT) between the request for the test and its performance, and, in these more urgent symptoms, it is around 73,3 days for

men and 20,4 days for women (Table 3).

When performing the analysis of the altered exams seeking their correlation with criteria of age, BMI, related comorbidities and the presence of a family history of coronary artery disease, it was possible to clearly observe that in the female population the age was between 39 and 80 years. In addition, 95% of the alterations were correlated with overweight, SAH and, in addition, 50% of them had a family history of coronary heart disease.

In men, the age was between 32 and 74 years, the expression of BMI was present in a reserved way, with only 30,0% of representation in overweight, however when associated with family history, 90,0% of this population was predisposed to this risk factor.

Among the results of the analyzed exams, 58,1% were altered. Of these, 55,0% had only one change, followed by 27,7% with two changes and 16,6% with three changes. These data represent a value of 18 electrocardiographic conclusions that resulted in 14 distinct diagnoses that were stratified in Table 4. The main electrocardiographic alteration was nonspecific ventricular repolarization, which corresponds to 22,2% of the conclusions.

The findings of this study are intrinsically correlated with all observed risk factors, which are modifiable (obesity) and non-modifiable (gender, age, height), as well as with self-reported comorbidities, in order to provide and justify the emergence of all symptomatology, in view of the worsening of the clinical manifestations (cardiovascular events) diagnosed by the ECG.

DISCUSSION

In the present study, there was a prevalence of females (67,7%). This finding was already expected in view of the study's hypotheses, in order to be corroborated in two other studies, one

carried out in 2012 in the city of Criciúma (Santa Catarina) with the analysis of 1.949 ECG reports carried out in a UBS, of these, 1.230 (63,1%) were female, and another in 2013, with an analysis of 161 ECG tracings, with approximately 57,8% of female patients. (6,7)

According to the latest data from the Ministry of Health (MH), CVDs are responsible for a large part of mortality in Brazilians, corresponding to 31% of all deaths, being proportionally higher in women when compared to men. (8) The mean age found was 49,86 years for both sexes. Similar findings were found in other studies which were carried out in populations without previous pathologies and with 34.371 patients whose mean age was between 35 and 54 years old. (9,10)

Age is a risk factor for the development of SAH, as well as for the acquisition of a CVD. Women between 45 and 55 years of age are usually affected, a period that marks the onset of climacteric (period of transition from the reproductive phase to the post-menopausal phase), when the production of estrogen by the ovaries gradually decreases. In this way, the woman loses the important cardiovascular protection promoted by estrogen. Unlike males whose prevalence of CVD occurs before the age of 50 as a result of other risk factors, such as smoking, alcohol consumption, obesity, poor eating habits, work activities with greater physical effort, among others.

As for the BMI, it was possible to observe that 58.0% of the patients were overweight. It is inferred from this finding that the population has increased the predisposition to sedentary lifestyle and, consequently, to the development of obesity in the long term. Still, there are two groups of risk factors, which are non-modifiable and modifiable through lifestyle interventions such as overweight and obesity. (11) Although sedentary lifestyle has not been stratified in the national panorama, for some

Table 1 – Descriptive profile of the population attended to perform ECG with telecardiology report in PHC. Montes Claros, MG, Brazil. (n=31)

Variable	Frequency								
	Male			Female			General		
	n	%	AA	n	%	AA	n	%	AA
Sex	10	32,3	-	21	67,7	-	31	100	-
Age (years)	-	-	53,0	-	-	50,2	-	-	49,8
Weight (kg)	-	-	43,5	-	-	81,5	-	-	68,5
Height (cm)	-	-	168	-	-	155	-	-	159
BMI (kg/m2)	-	-	31,8	-	-	24,7	-	-	29,8
Low weight	00	0,0	-	02	6,5	-	02	6,5	-
Normal	03	9,6	-	04	12,9	-	07	22,5	-
Overweight	05	16,2	-	13	41,9	-	18	58,1	-
Grade I obesity	00	0,0	-	01	3,2	-	01	3,2	-
Grade II obesity	02	6,5	-	00	0,0	-	02	6,5	-
Grade III obesity	00	0,0	-	01	3,2	-	01	3,2	-

Source: Data research, 2018. AA = Arithmetic Average.

Table 2 – Comorbidities self-reported by the population attended to perform ECG with telecardiology report in the PHC service. Montes Claros, MG, Brazil. (n=31)

Self-reported comorbidities	Male		Female		General	
	n	%	n	%	n	%
SAH	06	19,4	11	35,4	17	54,8
Previous AMI	01	3,2	00	0,0	01	3,2
CKD	00	0,0	00	0,0	00	0,0
CD	00	0,0	00	0,0	00	0,0
Previous CABG	00	0,0	00	0,0	00	0,0
Smoking habits	00	0,0	00	0,0	00	0,0
DM	00	0,0	01	3,2	01	3,2
Chronic Lung Disease	00	0,0	00	0,0	00	0,0
Family history of Coronary Heart Disease	03	9,7	09	29,1	12	38,8

Source: Data research, 2018. SAH = Systemic Arterial Hypertension. AMI = Acute Myocardial Infarction. CKD = Chronic Kidney Disease. CD = Chagas disease. CABG = Coronary Artery Bypass Graft (CABG) DM = Diabetes Mellitus.

Table 3 – ECG indication stratification and average waiting time for its performance. Montes Claros, MG, Brazil. (n=31)

Reason	Male			Female		
	n	%	AWT	N	%	AWT
Chest pain, burning, stabbing, tingling and uncompensated BP	03	9,6	73,3	05	16,1	20,4
Frequent dyspnea	00	0,0	0,0	02	6,7	105,0
Decompensated SAH/BP	01	3,2	10,0	03	9,6	72,3

time it has been mentioned by several authors as an important risk factor for CVD. (12)

Aiming to identify the epidemiological profile of the study users, the presence of pre-existing comorbidities was investigated and the prevalence of family history for coronary heart disease was found in 67,7% of the study participants, followed by SAH in 54,8%. Given this fact, it is possible to infer that, even if the patient does not have SAH, he may have a family history in order to influence the predisposition to the disease. This fact corroborates an epidemiological study which emphasizes genetic factors, which account for 30% of the variation in blood pressure (BP) in different populations, and that SAH is twice as frequent in subjects with one of their hypertensive parents. (13)

As for the indication criteria for the examination, there is the presence of symptoms correlated with pain, burning and tingling in the precordial region, decompensated SAH and frequent dyspnea. The identification of these factors has a direct impact on the concern with the waiting time between the request for the test and its performance in view of the complications of complaints, and, in these more urgent symptoms, the average waiting time is around 20,4 days for women and 73,3 days for men. The long waiting time can cause several problems for patients, their families and society. For patients, the disease may worsen, leading to death, psychological problems and repercussions for their families. (14)

With regard to electrocardiographic alterations, the percentage of exams that were abnormal generally ranged between 20 and 88,9%, and, in the present study, this percentage was 58,1%. Although several types of abnormalities were found in the altered exams, the Nonspecific Ventricular Repolarization Alteration (NVRA) prevailed. Its evaluation through ECG is

Surgical risk	00	0,0	0,0	05	16,1	25,0
Routine follow-up (arrhythmias, angina)	03	9,6	18,3	04	12,5	127,5
Previous AMI	01	3,2	60,0	00	0,0	0,0
Unable to inform	02	6,7	30,0	02	6,7	16,5
Total	10	32,3	-	21	67,7	-

Source: Research data, 2018. AWT = Average Wait Time (in days). SAH = Systemic Arterial Hypertension. BP = Blood Pressure. AMI = Acute Myocardial Infarction

Table 4 – Description of findings from ECG results. Montes Claros, MG, Brazil. (n=31)

Conclusion	Male		Female		Geral	
	n	%	n	%	n	%
Short PR interval	00	0,0	02	6,4	02	6,4
Nonspecific intraventricular block	00	0,0	01	3,2	01	3,2
Left anterior superior divisional block	01	3,2	02	6,4	03	9,6
Extended QT Interval	00	0,0	01	3,2	01	3,2
WNL for sex and age	03	9,6	10	32,2	13	41,8
Right ramus conduction disorder	02	6,4	01	3,2	03	9,6
Nonspecific changes in ventricular repolarization	01	3,2	03	9,6	04	12,8
Sinus tachycardia	00	0,0	02	6,4	02	6,4
Left atrial overload	00	0,0	01	3,2	01	3,2
Slow R-wave progression in precordial leads	01	3,2	01	3,2	02	6,4
Left branch block	01	3,2	02	6,4	03	9,6
Electrically inactive area that may be associated with previous AMI	02	6,4	02	6,4	04	12,8
1st degree atrioventricular block	01	3,2	00	0,0	01	3,2
Right branch block	01	3,2	00	0,0	01	3,2

Source: Research data, 2018. WNL = Within Normality Limits. AMI = Acute Myocardial Infarction.

extremely complex, as it represents the interaction of several systems capable of expressing themselves in segments and electrical waves. (15)

The phenomenon of repolarization gained greater notoriety as it contributed to the risk stratification of severe arrhythmic events and sudden death. In recent decades, the great advances were the definitions of the dispersion of ventricular repolarization, a marker of non-uniform myocardial excitability recovery and the recognition of macro or micro cyclical alternation of the T wave, this data is in agreement with the findings of studies that sought to verify the main results of ECG abnormalities. (6,15)

In addition, it is important to note that this is a factor to consider since a study carried out in the city of Cotia (São Paulo) in 2002 concluded that NVRA was a risk factor for ischemic disease, mainly in female patients. (15)

CONCLUSION

The thematic novelty is a limitation of the study, considering that in the scientific literature there are no other recent studies addressing the topic. Furthermore, the assessment of the post-diagnosis patient limits the study to a more detailed approach. It was possible to notice that, due to an overload in the services' schedule, the waiting time

for the exam is often long, a worrying factor, as it directly interferes with diagnosis and care.

Obese women over 50 years of age have a greater predisposition to CVD when compared to men, because after this age, the woman presents hypoeutrogenism, a characteristic responsible for the onset of menopause, as well as the increased risk for the development

of chronic diseases, such as SAH, heart disease, acute myocardial infarction (AMI), among others. Thus, with the senescence process, changes in heart rhythm become noticeable through the performance of the ECG.

Therefore, although most tests did not show changes, socioeconomic (gender, age), metabolic (weight, BMI) and genetic (family history) variables

are a risk factor for the development of CVD. It is then suggested that further studies be carried out to identify and assess the profile of this patient before, during and after the examination and diagnosis, aiming at changing the modifiable risk factors in order to have a better prognosis for the patient.

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