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Research Article

Assessment of screening for diabetic retinopathy through a clinical audit in a rural primary health care unit in the interior of Minas Gerais

Avaliação do rastreio de retinopatia diabética por meio de uma auditoria clínica em uma Unidade de Atenção Primária à Saúde rural no interior de Minas Gerais

Evaluación de cribado de retinopatía diabética mediante auditoría clínica en una Unidad de Atención Primaria de Salud en la zona rural de Minas Gerais

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Abstract

Introduction: Diabetic retinopathy is a complication of diabetes mellitus with a major impact on health, but its diagnosis through ophthalmoscopy and early treatment have been shown to reduce progression to visual loss. In the area assigned by the primary health care center where the present study was carried out, the medical team noticed a significant number of people who did not have a fundus examination periodically. **Objective:** To assess the rate of people adequately screened for retinopathy among those with type 2 diabetes in this rural location. **Method:** This study was an experience report of conducting a clinical audit to assess the rate of retinopathy screening among type 2 diabetics in a primary health care center. For this purpose, a spreadsheet with diabetic patients was generated electronically by the e-SUS record with subsequent reading of the record of the last two years in search of mentioning the performance of ophthalmoscopy. **Results:** The report generated 3736 active registrations, of which 181 were diabetic, of which, 156 were selected for analysis because they were proven to be type 2 diabetics. The screening rate in the last two years was 13.4%. In 61.9% of the cases, fundoscopy was performed at the primary health care center itself. **Conclusion:** The clinical audit was a useful tool in confirming and delimiting the suspicion of a low rate of screening for diabetic retinopathy. The accomplishment of fundoscopy by the trained family and community doctor was a strategy that allowed an increase in this percentage.

Keywords: Diabetic retinopathy; Diabetes complications; Rural health; Clinical audit; Primary health care.

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Resumo

Introdução: A retinopatia diabética é uma complicação do diabetes mellitus com grande impacto na saúde, mas seu diagnóstico por oftalmoscopia e a instituição do tratamento precoce comprovadamente reduzem a progressão para a perda visual. No território adscrito pela Unidade de Atenção Primária à Saúde (UAPS) onde realizou-se o presente estudo a equipe médica percebeu uma quantidade significativa de pessoas que não realizam fundo de olho periodicamente. **Objetivo:** Avaliar a taxa de pessoas adequadamente rastreadas quanto à retinopatia entre os diabéticos tipo 2 dessa localidade rural. **Métodos:** Este estudo consiste em um relato de experiência da realização de uma auditoria clínica para avaliar a taxa de rastreio de retinopatia entre diabéticos tipo 2 de uma UAPS. Para isso foi gerada uma planilha com os pacientes diabéticos de forma eletrônica pelo prontuário e-SUS, com posterior leitura de prontuário dos últimos dois anos em busca de menção à realização de oftalmoscopia. **Resultados:** O relatório gerou 3.736 cadastros ativos, dos quais 181 eram diabéticos. Destes, 156 foram selecionados para análise por serem comprovadamente diabéticos tipo 2. A taxa de rastreio nos últimos dois anos foi de 13,4%. Em 61,9% dos casos, a realização de fundoscopia foi realizada na própria UAPS. **Conclusão:** A auditoria clínica foi uma ferramenta útil para confirmar e delimitar a suspeita de baixa taxa de rastreio de retinopatia diabética. A realização de fundoscopia pelo médico de família e comunidade com treinamento foi uma estratégia que permitiu elevar essa porcentagem.

Palavras-chave: Retinopatia diabética; Complicações do diabetes; Saúde da população rural; Auditoria clínica; Atenção primária à saúde.

Resumen

Introducción: La retinopatía diabética es una complicación de la diabetes mellitus con gran impacto en la salud, pero cuyo diagnóstico mediante oftalmoscopia y tratamiento precoz ha demostrado reducir la progresión a la pérdida visual. En el territorio asignado por la Unidad de Atención Primaria de Salud (UAPS) donde se realizó el presente estudio, el equipo médico detectó un número importante de personas que no realizan periódicamente un fondo de ojo. **Objetivo**: evaluar la tasa de personas adecuadamente cribadas para retinopatía entre los 87 diabéticos tipo 2 en esta zona rural. **Método:** Este estudio es un informe de experiencia de la realización de una auditoría clínica para evaluar la tasa de detección de retinopatía entre diabéticos tipo 2 en un Unidad de Atención Primaria de Salud. Para ello, se generó electrónicamente una hoja de cálculo con pacientes diabéticos mediante el registro e-SUS con posterior lectura del registro de los últimos dos años en busca de mencionar la realización de oftalmoscopia. **Resultados:** El informe generó 3736 registros activos, de los cuales 181 eran diabéticos, de estos, 156 fueron seleccionados para análisis porque se demostró que eran diabéticos tipo 2. La tasa de cribado en los últimos dos años fue del 13,4%. En el 61,9% de los casos la fondoscopia se realizó en la Unidad de Atención Primaria de Salud. **Conclusión:** La auditoría clínica fue una herramienta útil para confirmar y delimitar la sospecha de una baja tasa de cribado de retinopatía diabética. La realización de fondoscopia por parte del médico de familia y de la comunidad capacitado fue una estrategia que permitió incrementar este porcentaje.

Palabras clave: Retinopatía diabética; Complicaciones de la diabetes; Salud rural; Auditoría clínica; Atención primaria de salud.

INTRODUCTION

The World Health Organization (WHO) lists diabetes mellitus as the third most important cause of premature mortality, preceded only by high blood pressure and smoking.[1] Given this highly relevant scenario, the adoption of measures that minimize the appearance of chronic complications, such as diabetic retinopathy (DR), is beneficial in promoting reduced morbidity associated with diabetes, especially in a rural setting, where access to health services is notably more challenging.[2]

The International Diabetes Federation (IDF) estimates that diabetes mellitus affects 463 million people around the world and that in Brazil there are 16.78 million people aged between 20 and 79 years who live with this disease, which corresponds to 10.4% of the population in this age group.[3] The Surveillance of Risk and Protective Factors for Chronic Diseases by Telephone Inquiry (Vigitel) carried out in Brazil in 2018, with people over 18 years old shows that the prevalence of the self-reported diagnosis of diabetes had a national average of 7.6%, and the subdivision by sex showed 7.1% among men and 8.1% among women.[4]

Complications of diabetes can be divided into macrovascular and microvascular. The presence of diabetes mellitus is an independent risk factor for coronary artery disease, stroke, peripheral vascular disease and heart failure, the main causes of death in these patients.[5] Microcirculation disorders are

traditionally categorized into retinopathy, nephropathy and neuropathy, which are respectively the most common causes of irreversible blindness, chronic kidney disease and non-traumatic lower limb amputations.[6] Complication rates, especially macrovascular ones, have decreased in the last 20 years in some countries; however it is suggested that this is due to the increased prevalence of diabetes and better control of risk factors and health care, which results in increased years of living with the disease.[7]

DR is a specific microvascular complication of type 1 or 2 diabetes mellitus, whose prevalence is strongly related to the duration of the disease and the level of glycemic control.[8] This condition is the main cause of blindness in adults aged 20 to 74 years; in addition, other ocular conditions such as cataracts and glaucoma are more common in people living with diabetes.[9] It is estimated that there are 93 million individuals with some degree of DR, and that one-third of this population requires some form of treatment. Other studies estimate that DR affects 35 to 40% of patients with diabetes mellitus, that is, approximately 4 million people in Brazil.[10] Retinopathy can be graded as mild, moderate or severe non-proliferative and proliferative retinopathy, and the gold standard treatment for reducing the risk of visual loss is laser photocoagulation, indicated mainly for patients with proliferative DR.[10]

Early diagnosis of DR through screening is important, as effective treatment is available. In addition, most people have symptoms only in advanced stages of the disease, and intervention is more useful in preventing than reversing visual loss.[11] It is recommended that screening begin at the time of diagnosis of type 2 diabetes mellitus or after five years of disease in patients with type 1 diabetes mellitus.[12] The chosen method should be fundoscopy under pupil dilation or fundus photography under pupil dilation, and the examination should be performed by a professional with expertise in the procedure.[11]

The periodicity of the screening still lacks more robust studies to detail the cost-effectiveness. In people with no evidence of retinopathy at the first examination, the Ministry of Health's Notebook of Primary Care — Diabetes Mellitus suggests that it be performed annually,[13] with the same recommendation coming from the Brazilian Society of Diabetes[10] and by the American Academy of Ophthalmologists.[11] The American Diabetes Association (ADA) advises that screening in these patients who have minimal or absent retinopathy should be performed every one or two years, [14] in addition to citing a study demonstrating efficacy at a three-year interval;[15] less frequent intervals are potentially cost-effective in projection models.[16]

Another reason that makes screening important is the intense social medicalization process, which can lead to excessive and sometimes harmful diagnostic and therapeutic interventions.[17] Often, the decision to incorporate population screening programs does not only take medicine into account. based on evidence, but political demands and those of corporations and scientific societies. When this occurs, resources may be misallocated and may not be of benefit to the people.[18]

Given this scenario, the clinical audit can be one of the tools used in monitoring the screening of health conditions. It is a process of improving the quality of the service offered through a systematic review of the services provided and endorsed by explicit quality criteria.[19] If the need for change is demonstrated, a re-audit is carried out to confirm the improvement in the provision of care after implementing these changes. Therefore, the clinical audit involves the following steps: selection of the topic, selection of quality criteria for improving practice, data collection, analysis of data in relation to quality criteria, feedback on results, discussion of possible changes and implementation of the agreed changes.[20]

This study was based on the experience in a family health team in Amarantina, a rural district in the municipality of Ouro Preto (MG), where the Medical Residency Program in Family and Community Medicine in the Federal University of Ouro Preto (PRMMFC-UFOP) was established in March 2020. The health team serves approximately 5,600 registered patients, divided into three health units: Amaranthine,

Maracujá and Coelhos, with approximately 3,700, 1,400 and 500 people, respectively. The size of the population, way of life, culture and distance from large centers that provide services characterize the district of Amarantina as a rural area.[21] It was seen during medical consultations and reading the medical records that many diabetic patients were inadequately controlled and also that many of them lived with complications resulting from the disease. The portfolio of services offered to these patients was increased by performing fundoscopy at the primary health care unit PHCU).

The main objective of this work was to report the process of carrying out a clinical audit of the quality of diabetic retinopathy screening in patients with type 2 diabetes mellitus in a family health team and to discuss measures to increase the proportion of people screened in the area.

METHODS

This was an experience report type article concerning the performance of a clinical audit in a PHCU in a rural community in the municipality of Ouro Preto. The selection of the subject "Monitoring of diabetic retinopathy screening in patients with type 2 diabetes mellitus" was based on the subjective impression of the medical team that these patients were not being adequately monitored, considering the number of people cared for who were living with this complication and of the positive impact that early detection of this health condition provides. A literature review was carried out in a narrative form and the quality criteria used to support the improvement of the practice were sought in secondary databases, namely UpToDate and DynaMed, as well as recommendations from national and international guidelines, namely, Guidelines of the Brazilian Society of Diabetes, Ministry of Health's Primary Care Notebook - Diabetes Mellitus, ADA, American Academy of Ophthalmologists and National Institute for Health and Clinical Excellence in the United Kingdom. The screening interval every two years was used as the gold standard criterion, a recommendation that was proposed by the ADA and evidence-based.

The size of the registered population and the stratification by age range occurred by producing an individual registration report, while the verification of diabetic patients occurred by preparing a cardiovascular risk report, both generated automatically by the electronic medical record e-SUS on October 28, 2020. The electronic system of the e-SUS considers that patients are diabetic when it is registered by the community agent in this way or when a higher-level professional classifies that patient as having diabetes in the field of International Classification of Diseases (ICD) or International Classification of Primary Care (ICPC) during a consultation, in this way the report appears as a referred diagnosis when registered by the community agent or clinician when registered by the doctor or nurse. The operational report generated a nominal list with hypertensive and diabetic users. The diabetic patients were then transferred to a Microsoft Excel® 2016 spreadsheet, and subsequently, the individual analysis of the medical records was carried out. When reading the medical records, certification that they had type 2 diabetes and whether there was reference to ophthalmological monitoring in the last two years was considered. For this, it was taken into account if there was a record and estimated date of performing the fundus examination or if there was a referral to the ophthalmology specialty, regardless of the ocular complaint. It was decided not to discriminate the degree of diabetic retinopathy in the analysis, since the purpose was to determine if the minimum interval was met.

The audit took place only at the headquarters of Amarantina, where 80% of the medical team's workload is carried out and where the majority of the population is concentrated. This was because the medical records of the three health units were not interconnected. After collecting and analyzing the

data, the results were presented in a meeting with all team members and possible changes in favor of improvements were discussed.

This article was written in accordance with Resolution 510/16 of the National Health Council.

RESULTS AND DISCUSSION

The report generated by e-ESUS showed that on the date determined there were 3736 people enrolled in the area, 51% women and 49% men. There were 181 people who had diabetes, 53% women and 47% men, which was a proportion compatible with data from Vigitel, showing a slight prevalence of females.

From this list of 181 diabetic patients, 21 were excluded because there was no mention of the diagnosis of diabetes, and 3 were type 1 diabetics, while in only one case, it was not possible to differentiate the type of diabetes by reading the medical records. In sum, 156 patients were selected. Among these, the overall prevalence of type 2 diabetes mellitus in the enrolled population was 4.17%. When considering the population aged 20 years or older, whose result was 2918 people, the prevalence increased to 5.34%, a result lower than the national average of 7.6%.[4] This finding may be related to underdiagnosis of diabetes mellitus in the area associated with the portion of the population with health monitoring in other establishments.

Among the 156 patients included in the data analysis, 21 has a record of having a fundoscopy performed in the last two years, with 13 having it in the last year and 8 between one and two years ago, which corresponded to 13.4% of the patients. Of these 21 patients, 13 underwent fundoscopy at the PHCU after implementing the PRMMFC-UFOP, corresponding to 61.9% of the cases. As reported, screening periodicity is still not a consensus among recommendations; if annual screening was chosen, the rate of patients with adequate screening would be even lower. In a study with a similar population, the lack of regular ophthalmological follow-up was also observed, with the last evaluation being carried out, on average, 2.4 years prior.[22] Another fact was that among the 156 diabetic patients, there was no record of consultations in the last two years for 31, which corresponds to 17.1% of people. This number demonstrates that the problem is, first, difficulty in accessing the health service.

The results were presented to the Family Health team, and the possible reasons for the low screening rate were discussed among members, as recommended for a clinical audit. The causes listed were multifactorial and touched on issues such as the team's work overload due to the excess of patients under care, lack of professionals with specific training in family and community medicine in previous years in the team, lack of monitoring instrument and active search for diabetic patients in the area, delay in consultations sent to the ophthalmologist, lack of counter-referral of the specialty and lack of effective communication between team members to achieve this objective. In addition, questions were raised involving the financing model of PHC, in which there is little incentive to meet goals.

Some short-term measures were thought to increase the tracking rate. They included keeping an updated spreadsheet with diabetic patients that can be edited by all team members, recording in the medical record of the date of the last fundoscopy and which findings were visualized, and carrying out or scheduling eye fundus examinations during medical appointments or nursing performed for other reasons.

Measures designed for the medium term include creating a fundoscopy task force on a specific date, preceded by community health workers' disclosure to the community. The importance of performing a fundus examination by the family and community physician is highlighted, a technique considered desirable according to the Competency-Based Curriculum prepared by the Brazilian Society of Family

and Community Medicine (SBMFC).[23] Given this, it was thought to expand the training of resident physicians in family and community medicine to acquire this skill. The accuracy of fundoscopy performed by primary care physicians has already been studied, with results showing lower sensitivity than that of well-trained ophthalmologists,[24] but it must be considered that the training received by these family physicians is not described in the article. In addition, there are few studies on this topic, as well as a lack of ophthalmologists in the region. Given this scenario of scarcity, a screening method with great potential is digital fundus photography performed by family doctors using a non-mydriatic fundus camera, with the use of telemedicine being a great advantage in this regard, considering that specialized centers are far away for the majority of the population.[25] A Brazilian study[26] demonstrated that trained family physicians have good accuracy, specificity and sensitivity for the evaluation of digital retinal photographs and DR classification and concluded that mydriasis is necessary in few patients, generally elderly. This study brings the contribution that trained family physicians can contribute to population screening for DR.

Dialogue with management was also considered essential to leverage screening rates through articulation, with the Municipal Health Department, of a specific flow of these patients for screening with focal specialists when necessary, as well as the establishment of a counter-referral flow. Another possible alternative is the acquisition of a non-mydriatic retinograph and the training of family physicians in its handling and interpretation of images.

Although outside the scope of local micromanagement, the form of remuneration is another issue that could have an impact on the achievement of goals by the team. The most notorious example of variable remuneration based on clinical management comes from the National Health Service (NHS), the English health system, in which the management's eyes fall on the standards of care.[27] It must be borne in mind, however, that payment for performance can produce unexpected or undesirable effects, motivating distorted behavior, such as ignoring important unrewarded tasks and selecting patients based on the ease of achieving goals.[28] Therefore, the challenges in reconciling forms of remuneration that do not distort the principles are essential principles of PHC.

The following limitations and difficulties of this experience are pointed out: the absence of a consensus recommendation on the frequency of screening with better cost-effectiveness based on solid evidence; the fact that the absence of counter-referral did not allow confirming whether screening was actually carried out during referral to the specialty; and the erroneous attribution of the diabetic condition in the preparation of the register, which generated a cardiovascular risk report with some incorrect data. In addition, data collection was carried out only through the report generated by e-SUS; if the person had not been registered as diabetic or the diabetes category according to the ICD or ICPC had not been included during consultations, the person was not included in the report.

CONCLUSION

The clinical audit proved to be a useful tool to determine the extent of the problem, promote the search for clinical updates on the subject and generate reflections for changes in daily clinical practice. Through it, we found that screening of DR was below that recommended by quality standards, and that measures need to be implemented to reduce the morbidity associated with diabetes. These are especially needed in rural areas, where health inequities have historically been greatest. The training of family and community physicians in the technique of fundoscopy and in the acquisition and interpretation of non-mydriatic photographs emerges as a useful strategy, and its essential role in the coordination of care is highlighted.

Carrying out a re-audit in the future will make it possible to discover whether the implemented measures have generated better results.

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CONFLICT OF INTERESTS

Nothing to declare.

AUTHORS' CONTRIBUTIONS

PPOJ: Conceptualization, Data curation, Formal analysis, Writing – original draft, Writing – review & editing. **FAGC:** Conceptualization, Data curation, Formal analysis, Writing – Original draft.

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