

Fundoscopy findings of diabetic and/or hipertensive patients

Achados de fundoscopia de pacientes diabéticos e/ou hipertensos

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ABSTRACT

Objective: To analyze the prevalence of alterations in funduscopy of patients with Diabetes Mellitus (DM) and/or Systemic Arterial Hypertension (SAH) referred to the Ophthalmology Reference Service, located in a Basic Health Unit of the city of Patos, Paraíba). **Methods:** A descriptive, cross-sectional study with a quantitative approach, which involving a total of 22 patients. For data collection, a questionnaire on ocular health was used. In addition, the research members participated in the Snellen visual acuity test and visual acuity near, intraocular pressure measurement and direct ophthalmoscopy examination. Those who obtained worse visual acuity were conducted for retinography. The data were evaluated through statistical analysis using the Statistical Package for the Social Sciences - SPSS. **Results:** Of the total of 22 patients, 11 were submitted to retinography. Of these, 36.3% were diabetics only; 27.4% were hypertensive only and 36.3% were diabetic and hypertensive. The main alterations found were diabetic retinopathy, hypertensive retinopathy, cataract, glaucoma, choroidal nevus, pigmentary retinitis and peripapillary staphyloma. **Conclusion:** It is noticed that DM and SAH have a great negative impact on ocular health. To reduce this harmful effect it is necessary that the fundus eye exam be performed annually for the purpose of early diagnosis of certain pathologies and avoid future complications, culminating in lower costs for the health system and more quality of life for patients.

Keywords: Fundoscopy; Diabetes Mellitus; Hypertension; Retinography; Visual acuity

RESUMO

Objetivo: Analisar a prevalência de alterações na fundoscopia de pacientes portadores de Diabetes Mellitus (DM) e/ou Hipertensão Arterial Sistêmica (HAS) encaminhados ao Serviço de Referência de Oftalmologia, localizado em uma Unidade Básica de Saúde do município de Patos, Paraíba (PB). **Metodos:** Estudo de caráter descritivo, transversal e com abordagem quantitativa, que envolveu um total de 22 pacientes. Para a coleta de dados, foi utilizado um questionário sobre a saúde ocular. Além disso, os integrantes da pesquisa participaram do teste da acuidade visual de Snellen e acuidade visual para perto, da medida da pressão intra-ocular e do exame da oftalmoscopia direta. Os que obtiveram pior acuidade visual foram conduzidos para a realização de retinografia. Os dados foram avaliados através de análises estatísticas utilizando o Statistical Package for the Social Sciences – SPSS. **Resultados:** Do total de 22 pacientes, 11 foram submetidos ao exame de retinografia. Destes, 36,3 % eram apenas diabéticos; 27,4% eram apenas hipertensos e 36,3% eram diabéticos e hipertensos. As principais alterações encontradas foram retinopatia diabética, retinopatia hipertensiva, catarata, glaucoma, nevus de coróide, retinose pigmentar e estafiloma peripapilar. **Conclusão:** Percebe-se que DM e HAS tem grande impacto negativo sobre a saúde ocular. Para diminuir esse efeito nocivo é necessário que o exame de fundo de olho seja realizado anualmente com a finalidade de diagnosticar precocemente certas patologias e evitar complicações futuras, culminando em menores custos para o sistema de saúde e mais qualidade de vida para os pacientes.

Descritores: Fundoscopia; Diabetes Mellitus; Hipertensão; Retinografia; Acuidade visual

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The authors declare no conflicts of interests.

Received for publication 20/06/2019 - Accepted for publication 09/12/2019.

INTRODUCTION

Noncommunicable chronic diseases (NCDs) are a global health issue and a threat to human health and development; they accounted for approximately 72% of deaths in Brazil in 2007.⁽¹⁾ NCDs are characterized as long-term evolution diseases susceptible to early detection, appropriate treatment and effective prevention.⁽²⁾

Brazil has experienced transitional processes that have significantly changed the profile of diseases affecting its population since the last four decades of the twentieth century. Nutritional transition, which derives from the continuous rise in the number of overweight and obese people due to changes in their dietary pattern and to the sedentary lifestyle of modern life, is among these processes.⁽³⁾ Diabetes mellitus and arterial hypertension are among the most prevalent NCDs.⁽¹⁾

According to estimates by the World Health Organization, 422 million adult individuals have diabetes mellitus (DM), which kills 1.6 million patients worldwide, on a yearly basis.⁽⁴⁾ This disease can damage many organs such as kidneys, peripheral nerves and, mainly, the eyes. DM can affect human eyes in different ways such as retinopathy, certain lens opacification types (cataract), increased intraocular pressure, rubeosis iridis and, assumingly, open-angle glaucoma.⁽⁵⁾

Diabetic patients are 29 times more likely to become blind than non-diabetic patients. Diabetic retinopathy (DR) is one of the most frequent diabetes adversities; it is associated with long DM duration and with inadequate glycemic control.⁽⁶⁾ According to estimates, 99% of patients with type 1 DM, and 60% of patients with type 2 DM, develop some form of DR after 20 years - DR is the most prevalent cause of acquired blindness among adult individuals.⁽⁷⁾

Systemic Arterial Hypertension (SAH) is a highly prevalent disease that affects approximately 50-70% of the elderly population in Brazil.⁽²⁾ It can be defined as increased blood pressure of multifactorial etiology, which has multisystemic repercussions that first affect the microvasculature of target organs such as the eyes; with emphasis to hypertensive retinopathy (HR).⁽⁸⁾ HR is described as a set of retinal changes in individuals with increased systemic blood pressure. It is essential investigating HR incidence in SAH patients to enable implementing drug therapy, even in patients classified as stage 1 SAH, due to great SAH-correlated cardiovascular risks.⁽⁷⁾

DR and HR follow-up can be based on regular eye examinations such as visual acuity, direct and indirect ophthalmoscopy, and on medical professionals' experience. It is important highlighting that funduscopy is a practical and easy method used to assess damages in target organs and to collect information about SAH and DM activity and evolution time. Physicians' awareness about the applicability of this exam is another instrument to help better monitoring and treating these diseases.⁽⁸⁾

Severe and irreversible eye complications can derive from such diseases; blindness is the most worrisome complication, since it has great socioeconomic impact. Thus, it is necessary performing funduscopy examination because, besides being a simple procedure, it is of great value to help early detecting relevant symptoms in order to enable proper disease diagnosis and treatment.

In light of the foregoing, the aims of the current study were to analyze the prevalence of changes in the fundus of diabetic and/or hypertensive patients' eyes, as well as to identify the clinical profile of these individuals and to correlate examination findings to decompensated DM and SAH.

METHODS

The current descriptive, cross-sectional study has followed a quantitative approach to investigate diabetic and/or hypertensive patients treated at the Ophthalmology Reference Service operating at the Minister Ernani Sátiro Basic Health Unit (BHU) in Patos County, PB.

The research was conducted from February to April 2019. Data collection was based on an instrument (Appendix 1) that included the following features: age, sex, place of birth, patients' perception about their own visual acuity, wearing glasses or contact lenses, allergies, medication use and history of previous surgeries. In addition, participants were subjected to visual acuity test based on Snellen chart, near visual acuity test based on Jaeger chart, intraocular pressure measurement based on a portable tonometer, and direct ophthalmoscopy examination. The study comprised 22 patients older than 18 years; of them, 11 presented the worst visual acuity and were referred to retinography examination. The sample investigated in the current study was of non-probability for convenience type.

All participants have signed the informed consent form before data collection. Data were assessed based on statistical analysis carried out in the Statistical Package for Social Sciences - SPSS.

The study was approved by the Research Ethics Committee of the Integrated Colleges of Patos - protocol n.02822918.9.0000.5181. It is important emphasizing that the precepts set in Resolutions 510/16 and 466/2012 by the National Health Council (NHC) of the Brazilian Ministry of Health (MH) were respected at all research stages.

RESULTS

Data about the 22 patients - 10 men (45.4%) and 12 women (54.6%) - were assessed. Patients' mean age was 58 years. Thirteen (59%) individuals were only diagnosed with DM, 9 (40.9%) were only diagnosed with hypertension, and 5 (22.7%) were diagnosed with both diseases. The mean intraocular pressure (IOP) in the right eye was 14 mmHg, whereas the mean IOP in the left eye was 13 mmHg.

Of the total number of participants in the research, 11 (50%) had visual acuity lower than 20/60 and were referred to retinography examination. Of the selected patients, 5 were men and 6 were women; 4 were only diabetic, 3 were only hypertensive and 4 were diabetic and hypertensive (Table 1). Their mean age was 63 years and they presented the following abnormalities: 3 (25%) cases of Cataract, 1 (8.3%) case of Retinitis Pigmentosa, 3 (25%) cases of DR, 2 (16.7%) cases of HR, 1 (8.3%) case of Peripapillary Staphyloma, 1 (8.3%) case of Choroid Nevus, and 1 (8.3%) case of Glaucoma (Table 2) (Figure 1). All DR patients had DM and SAH. The one patient with glaucoma and

Table 1
Clinical and epidemiological profile of patients presenting visual acuity lower than 20/60.

Clinical and Epidemiological Profile	N	%
Gender		
Female	6	54.4
Male	5	45.6
Diabetes	4	36.3
Hypertension	3	27.27
Diabetes and Hypertension	4	36.3

the ones with cataract had only DM. One of the two patients with HR was only hypertensive, whereas the other one was diabetic and hypertensive. Finally, patients with Choroid Nevus, Retinitis Pigmentosa and Peripapillary Staphyloma were only hypertensive.

Table 2
Abnormalities found in retinography examination

Valid	Frequency	Percentage	Valid Percentage	Cumulative Percentage
Peripapillary Staphyloma	1	8.3	8.3	8.3
Cataract	3	25	25	33.3
Coroid Nevus	1	8.3	8.3	41.6
Diabetic Retinopathy	3	25	25	66.6
Retinopathy Hypertensive	2	16.7	16.7	83.3
Glaucoma	1	8.3	8.3	91.6
Retinitis Pigmentosa	1	8.3	8.3	100
Total	12	100.0	100.00	

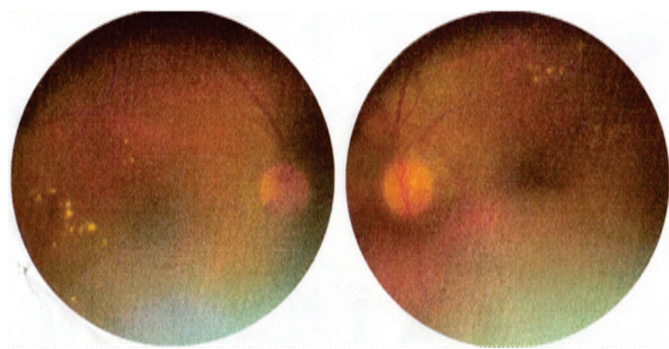


Figure 1: 62-year-old female diabetic (for 20 years) patient; retinographic diagnosis; proliferative DR in the right and left eyes (temporal retinal neovascularization).

DISCUSSION

The prevalence of female patients in the herein investigated population was similar to that of other studies available in the literature. This prevalence can be explained by the fact that women seek health services more often than men and it increases the likelihood of certain diagnoses.⁽⁹⁻¹⁰⁾

The prevalence of individuals with hypertension and/or DM in the age group older than 60 years is justified by the fact that these patients spend more time at home and, consequently, they exercise less. However, old age alone can be one of the causes accounting for increased SAH and DM rates, as reported in other studies.⁽¹¹⁻¹²⁾

With respect to visual acuity, DM and SAH were associated with low vision and legal blindness. This outcome was also observed in a research conducted in Iceland.⁽¹³⁾

Patients presenting severe visual acuity impairment were diagnosed with DR; DR and Cataract were the abnormalities most often observed in the exam. According to an analysis carried out in Portugal, untreated DR leads to irreversible visual loss in 50% of patients within 5 years after diagnosis. Thus, it is important implementing screening programs to enable the early diagnosis and treatment of this disease.⁽¹⁴⁾ Based on an Amazonian study, funduscopy examinations presented DR prevalence in comparison to other findings.⁽¹⁵⁾

Cataract was also strongly associated with reduced visual acuity. Such condition is one of the main causes of blindness (46.4%) and low vision (43.3%) in Latin America and worldwide.⁽¹⁶⁻¹⁷⁾ Oxidative stress is one of the mechanisms involved in Cataract pathogenesis; it is also observed in several diseases such as DM. Thus, the greater the exposure to this condition, the higher the lens opacification risk.⁽¹⁸⁾ According to a study conducted in Cuba, approximately 45-65% of patients with type 2 DM had cataracts.⁽¹⁹⁾

Patients with hypertensive retinopathy were women and belonged to a younger age group than patients presenting other abnormalities. This outcome did not meet other studies available in the literature, which showed association between old age and higher risk of developing HR, although these studies did not observe such association in variable 'sex'.⁽²⁰⁾

Glaucoma, Retinitis Pigmentosa, Peripapillary Staphyloma and Choroid Nevus accounted for only one case, each. With respect to glaucoma, some studies have reported association between DM and increased intraocular pressure. High blood glucose levels can lead to osmotic gradient, attract fluids into the intraocular space and increase the pressure in it.⁽¹⁹⁾

Retinitis Pigmentosa (RP) is part of a set of degenerative retinal diseases that lead to retinal dystrophy due to gradual photoreceptor (cones and rods) and retinal pigment epithelium decrease.⁽²¹⁾ Studies have shown RP association with SAH, as well as with glaucoma and progressive visual acuity decrease.⁽²²⁻²³⁾

Peripapillary Staphyloma is a rare, often unilateral, non-hereditary disorder belonging to the group of congenital papilla anomalies, in which the fundus of the eye presents a deep excavation around the optic disc. Individuals with this dysfunction present significant visual acuity impairment in the affected eye, which predominantly leads to mild myopia.⁽²⁴⁻²⁵⁾ Studies available in the literature did not report Peripapillary Staphyloma association with hypertension and/or DM. Choroidal nevus is known as a benign, often pigmented and well-circumscribed melanocytic tumor that, in most cases, is incidentally discovered during ophthalmic examinations.⁽²⁶⁾ Two US researchers have described a link between choroidal nevus and SAH (odds ratio [OR], 1.40; 95% confidence interval [CI], 0.99-1.98). However, they did not find association between choroidal nevus and DM or visual acuity.⁽²⁷⁾

Overall, it was possible noticing that impaired fundus of the eye and low vision were closely correlated to hypertension and DM, to prolonged exposure to these diseases and to old age. It was also noticed that the presence of most specific changes was more often observed in the group diagnosed with DM and SAH (45.5%), a fact that denoted the synergistic action of these pathologies in retinal damage. There is no consensus in the literature about the most affected sex.⁽⁷⁻¹⁵⁾

CONCLUSION

It is clear that SAH and DM have significantly negative impact on the vitality of the ocular system. Patients should be followed-up by general physicians, who should perform annual eye examinations to help reducing harmful effects deriving from these diseases. This practice enables such professionals to better control the clinical evolution of these patients, a fact that, above all, enables having greater accuracy at the time to indicate ophthalmic evaluations. Such measures aim at early diagnosing certain pathologies and at avoiding future complications; consequently, they help reducing health system costs and improving patients' quality of life.

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OCULAR HEALTH ASSESSMENT QUESTIONNAIRE

1. Age: _____

2. Place of birth: _____

3. Sex: Male () Female ()

4. How do you rate your visual acuity? Good () Poor () Regular () Don't know ()

5. Do you wear glasses or contact lens? Yes () No ()

6. Do you have allergy(ies)? Yes () No ()

If so, what allergy(ies) do you have? _____

7. Do you have any disease? Yes () No ()

If so, what disease(s) do you have? _____

8. Do you take medication(s)? Yes () No ()

If so, what medication(s) do you take? _____

9. Do you have history of previous surgery(ies)? Yes () No ()

If so, what surgery(ies) were you subjected to? _____

10. Strabismus: _____

11. Visual acuity in the right eye without correction: VA RY

12. Visual acuity in the left eye without correction: VA LY

13. Visual acuity in the right eye with correction: VA RY

14. Visual acuity in the left eye with correction: VA LY

15. Near visual acuity:

16. Intraocular pressure in the right eye:

17. Intraocular pressure in the left eye:

18. Blood pressure:
