

# Prevalência de alterações fundoscópicas em estudantes na cidade de Natal/Brasil

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## RESUMO

**Objetivo:** Determinar a prevalência de alterações fundoscópicas em estudantes de escolas das redes pública e privada de Natal-RN.

**Métodos:** Avaliação oftalmológica foi realizada em 990 alunos, de 5 a 21 anos, matriculados nas escolas das redes públicas e privada do município de Natal-RN, que estiveram cursando alguma série do ensino fundamental ou médio, no período de 03 a 06 de 2001.

**Resultados:** Alterações fundoscópicas foram observadas em 5,3% dos estudantes. As anormalidades encontradas, por ordem de frequência, foram: branco sem pressão, 1,0%; cicatriz de retinocoroidite sugestiva de toxoplasmose, 1,0%; atrofia do epitélio pigmentado da retina, 0,8%; nevos da coróide, 0,4%; escavação da cabeça do nervo óptico aumentada, 0,4%; degeneração em treliça, 0,3%; buraco operculado, 0,2%; fundus miópico, 0,2%; tortuosidade vascular aumentada, 0,2%; granuloma sugestivo de toxocaríase, 0,2%; hipoplasia da cabeça do nervo óptico, 0,1%; persistência da artéria hialoidea, 0,1%; persistência de fibras de mielina, 0,1%; retina sal e pimenta, 0,1%; retinosquise, 0,1%.

**Conclusão:** Houve uma baixa prevalência de alterações fundoscópicas na população estudada.

**Descritores:** Fundoscopia; Estudos de prevalência; Saúde escolar; Educação em saúde; Epidemiologia/Fundo de olho.

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## ABSTRACT

### Prevalence of funduscopy alterations in students of Natal/Brazil

**Purpose:** To assess the prevalence of fundus oculi abnormalities in students of elementary and secondary public and private schools in Natal/Brazil.

**Methods:** An ophthalmological examination was performed on 990 students aged 5 to 21 years from March to June of 2001.

**Results:** Fundus oculi abnormalities were diagnosed in 5.3% of the patients. These abnormalities, were distributed as follows: white without pressure 1.0%; retinochoroidal scar clinically suggestive as toxoplasmosis 1.0%; atrophy of the retinal pigmented epithelium 0.8%; choroidal nevus 0.4%; large cup 0.4%; lattice degeneration 0.3%; myopic fundus 0.2%; operculated tear 0.2%; augmented vascular tortuosity 0.2%; granuloma clinically suggestive as toxocariasis 0.2%; optic disc hypoplasia 0.1%; myelinated nerve fibres 0.1%; persistent hyaloid artery 0.1%; retinopathy with salt and pepper appearance 0.1%; retinoschisis 0.1%.

**Conclusion:** The results showed low frequencies of fundus oculi abnormalities.

**Keywords:** Funduscopy; Prevalence; School health; Health education; Epidemiology/Fundus Oculi

## INTRODUCTION

**F**unduscopy alterations are of utmost importance in ophthalmology. They affect persons of all ages, in all parts of the world. They are among the leading causes of legal blindness in the Western Hemisphere <sup>(1,2,3,4,5,6,7)</sup>.

Ocular health programs for students are important, since visual impairment interferes in learning and development, its early identification being of primary importance. Data from the World Health Association show that there are 20 million blind persons in the world, 2/3 of the cases being preventable <sup>(8)</sup>.

It is estimated that the vast majority of Brazilian students have never undergone ophthalmological examination and data from the Brazilian Council of Ophthalmology (CBO) show that 20% of these present some ocular disorder <sup>(9)</sup>.

The purpose of this study is to determine the prevalence of funduscopy alterations in students from the public and private school system in Natal/Brazil.

## METHODS

This is a transversal study, in which the sample was randomly selected. It consisted of

subjects between the ages of 5 and 21 years, enrolled in an elementary or secondary school, in the private or public system in Natal, Brazil, in 2001.

Four samples were considered for the methodology, corresponding to the four districts in which Natal is divided: North, South, East and West.

The student population in 2001 was 196.116, distributed by district and type of institution (public or private).

The methodological procedure for the sample selection was in two stages:

Stage I: Determining the sample size;

Stage II: Random selection of schools and their respective students.

The size of the general sample of 990 students was distributed proportionally among the four districts. Following this, the number of schools and which of these would be selected from each district, was determined by Proportional Probability of Size method (PPS), taking into consideration the type and level of each school. Of 341 schools, 79 were selected, from which were selected the number of students per study period and number of students per grade level, the selection being taken from the school attendance list, with the help of a random number generating computer program.

The students answered a standard

questionnaire, applied by medical professors and residents in Ophthalmology at UFRN, who provided identification, social-economic level as well as personal and familial nosologic precedents.

The 990 students underwent an ophthalmological examination which included: measuring visual acuity, diagnostic tests for strabismus (Hirschberg, Krimsky and occlusion test), refraction (retinoscopy under cycloplegia), biomicroscopy, tonometry.. A drop of 1% tropicamide and 1% cyclopentolate was instilled and 40 minutes later refraction and indirect binocular ophthalmoscopy were performed by two retina specialists. Students who presented lesions, biomicroscopy with a 78 diopter lens or three-mirror Goldman lens was performed.

For purposes of statistical analysis, relative and punctual frequency of the study variables was performed, and the data were processed by SPSS

computer program (Statistical Package for Social Science) Data Editor 10.0.

## RESULTS

Funduscopy alterations were observed in 5.3% of the students. Abnormalities encountered, clinically suggestive, by order of frequency were: white without pressure 1.0%; retinochoroidal scar 1.0%; atrophy of the retinal pigmented epithelium 0.8%; choroidal nevus 0.4%; large cup 0.4%; lattice degeneration 0.3%; myopic fundus 0.2%; operculated tear 0.2%; vascular tortuosity 0.2%; toxocariasis 0.2%; optic disc hypoplasia 0.1%; myelinated nerve fibres 0.1%; persistent hyaloid artery 0.1%; retinopathy with salt and pepper appearance 0.1%; retinoschisis 0.1% (TABLE 1).

Table 1

Prevalence of funduscopy alterations in students of public and private schools in natal/brazil, between march and june of 2001

Alterations	Frequency	
	Absolute	Percentage
White without pressure	10	1.0
Retinochoroidal scar	10	1.0
Pigmentary epithelium atrophy of the retina	8	0.8
Choroidal nevus	4	0.4
Large cup	4	0.4
Lattice degeneration	3	0.3
Operculated tear	2	0.2
Myopic fundus	2	0.2
Augmented vascular tortuosity	2	0.2
Toxocariasis	2	0.2
Optic nerve hypoplasia	1	0.1
Hyaloidal arteria persistence	1	0.1
Myelin fibre persistence	1	0.1
Salt and pepper retina	1	0.1
Retinoschisis	1	0.1
Total	52	5.3
Normal	938	94.7
Total	990	100.0

## DISCUSSION

The most frequent funduscopy alteration was white without pressure degenerative lesion. The retina had a greyish, translucent appearance. Associated findings included lattice degeneration areas<sup>(3)</sup>, present in two students.

The second most observed alteration was retinochoroidal scar (1.0%). The lesions were smooth, yellowish, with well-defined margins and hyperpigmented, suggesting toxoplasmosis. They were more frequent in the mono or polyfocal posterior pole, as is usually described in the literature<sup>(3,6)</sup>. As to frequency of toxoplasmotic ocular lesions in the general population, the literature reports values between 0.6 and 17%<sup>(10,11,12)</sup>.

Choroidal nevus lesions were unilateral, hyperpigmented, circular, smooth, well delimited, less than one optic disc in diameter and located more frequently in the posterior pole. The prevalence of 0.4% was less than that encountered in the Caucasian population, which has levels of up to 10%<sup>(3,6)</sup>. Degenerative alterations of the pigmentary epithelium of the retina, druses and associated serous detachment, as occasionally described<sup>(3,6)</sup>, were not detected.

Among lesions predisponent to rhegmatogenic detachment of the retina (RD)<sup>(13,14,15)</sup>, the most frequent found was lattice degeneration. Retinovitreal abnormality, which can also predispose for retinal holes<sup>(4)</sup>, is more common in myopic individuals. Findings associated with the lesions included degenerative alterations of the posterior pole<sup>(3)</sup>, observed in one student. The lesions were detected between the equator and the ora serrata, a location frequently described in the literature<sup>(3,14)</sup>. The prevalence of 0.3% was less than that encountered in other studies, which varies from 6 to 10%<sup>(4,14,15)</sup>.

Retinal holes occur in 10-15% of the population<sup>(14)</sup>. Occasionally, a small island of lattice degeneration may be present at the site<sup>(3)</sup>. The prevalence in this study was 0.2%. There were no associated peripheral degenerative lesions.

Severe myopia, another risk factor for developing RD<sup>(13,15)</sup>, was present in 0.2% of the students, while the prevalence is less than 2% in the occidental population<sup>(16,17)</sup>. Ophthalmoscopy showed degenerative alterations in the posterior pole, with islands of chorioretinal atrophy in two students, 9 and 12 years of age.

Augmented bilateral vascular tortuosity, symmetric and enveloping all quadrants of the retina,

was found in two students, 11 and 18 years of age.

Granuloma near the left optic nerve, with areas of atrophy of the pigmentary epithelium, without retinal traction and vasculature distortion was observed in one 14-year-old student. He had visual acuity, count fingers at 30 cm in the affected eye. Another 16-year-old presented slightly pigmented granuloma, well delimited, circular, and less than one optic disc in diameter, in the left inferior temporal vascular arcade, and visual acuity of 1.0 in both eyes. None of the students reported contact with puppies. In relation to prevalence of ocular toxocariasis, the literature describes one case per one thousand inhabitants in the state of Alabama, USA<sup>(11)</sup>.

Hypoplasia of the optic nerve, one of the most frequent disc anomalies in clinical practice<sup>(13)</sup>, presented a prevalence of 0.1% in the study population. Ophthalmoscopy revealed small right optic disc, enveloped by hypopigmented halo and retinal blood vessels of normal caliber, in a 22-year-old student. Low visual acuity, strabismus, lack of foveal reaction, aniridia, microphthalmia and nystagmus, occasionally present<sup>(6)</sup>, were not observed.

Hyaloid arteria persistency, one of the most common alterations of development<sup>(13)</sup>, was seen in the left eye of one 16-year-old student.

Myelin fibre persistence affects males and females equally and tends to be unilateral<sup>(13)</sup>. Affected eyes may have variable diminution of visual acuity, hypermetropia, myopia, amblyopia, strabismus, ocular nystagmus and druses of the optic nerve<sup>(18,19,20)</sup>, situations which were not observed.

Multiple small lesions, hypo and hyperpigmented, diffuse, peripheral and bilateral (retinal salt and pepper) were found in one 12-year-old student, with visual acuity of 1.0 in both eyes.

Retinoschisis, a common clinical finding<sup>(14)</sup>, generally bilateral, peripheral and predominantly found in the inferior temporal quadrants<sup>(6,13,14)</sup>, is encountered in 4-7% of the general population<sup>(6,14)</sup>, a greater frequency than that found (0.1%). It is more common in hypermetropic individuals<sup>(6)</sup>. Upon examination, a slight elevation of the retina was encountered in the extreme inferotemporal periphery of both eyes; in one 15-year-old student.

No signs suggestive of glaucoma were observed in students with large cup (>0.6)<sup>(3,6,21)</sup>.

However, it is important to note that individuals with visual impairment, being those from retinal abnormalities or other etiologies, do not usually attend schools, and therefore the results obtained cannot be generalized for the entire

population. There was a low prevalence of funduscopy alterations in the study population.

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