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Epidemiological Study of Ametropia at the CHU-BSS of Kati

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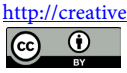

Abstract

Introduction: Ametropias or refractive errors are pathologies commonly encountered in ophthalmology characterized by the projection on the retina of a blurry image. There are several types of ametropia and each of them has a specific means of correction. In the literature, numerous data have been reported on the issue through studies that were mostly carried out on infant populations. To better treat ametropia in a more formal way, it is important to know their general characteristics within a larger population, hence the present investigation, the aim of which is to carry out an epidemiological study of ametropia at the Kati University Hospital-BSS. **Materials and Methods:** The study was carried out at Kati University Hospital-BSS between January 1 and December 31, 2022 and included 663 ametropic patients of all ages. **Results:** During the study period, 663 cases of ametropia were diagnosed out of 1678 new consultations, representing an incidence of 39.51%. Patients aged between 21 and 40 years were more affected. Depending on the type, these ametropias were dominated by compound astigmatism with 68.75% followed by isolated hyperopia and isolated astigmatism. Visual fatigue was the most mentioned reason for consultation. The female gender was in the majority with 70.9%. Low ametropia (<3 diopters) was more common. **Discussion:** The growing visual needs of young people, especially with new information and communication technologies, would push them to consult the ophthalmologist more, and therefore to want optical correction in the event of a refractive anomaly, which would partly explain their high frequency in this age group. **Conclusion:** It is important to know the general characteristics of ametropia in the general population in

order to improve the quality of life of patients affected by it through efficient therapeutic solutions.

Keywords

Epidemiology, Ametropia, University Hospital, Kati

1. Introduction

Ametropias are characterized by the inability of the eye without accommodation to clearly see objects located at infinity. The image projected on the retina is only a pseudo-image, which is blurred because it is composed of diffusion circles [1]. They are by far one of the most commonly encountered pathologies in ophthalmology. The visual difficulty caused by the lack of management of this pathological entity can have socio-professional repercussions. Worldwide, the prevalence of ametropia varies according to the studies. In China and Chile, the prevalence was 50.8% and 56.3% respectively [2] [3]. In Africa, most studies have been carried out on a child population. Thus, in the Democratic Republic of the Congo, Paluku *et al*. found an overall frequency of 11.47% [4]. In the studies carried out by Gbé *et al*. in Ivory Coast and Odoulami-Yehouessi *et al*. in Benin, the prevalence was respectively 29.85% and 9.2% [5] [6]. In Mali, Diallo and Diallo found respectively a prevalence of 46.8% and 18.9% [7] [8]. In order to know the global situation of these visual disorders within a wider population, we initiated this study, the aim of which is to study the epidemiological characteristics of ametropia at the CHU-BSS of Kati.

2. Materials and Methods

Study setting: The study was carried out at the Bocar Sidi Sall University Hospital in Kati, which has a 2nd level ophthalmology center.

Type and period of study: We carried out a descriptive cross-sectional study covering the period from January 1 to December 31, 2022.

Study population and selection criteria and information collection:

The sampling involved all patients who consulted during the study period and gave their consent to participate in the survey. Those who did not consent to participate in the study were excluded. Information on the patients was collected on a pre-established survey form.

2.1. Ophthalmological Examination

All patients underwent a complete ophthalmological examination based on the measurement of distance acuity assessed on the Snellen optotype scale, the state of the anterior segment and the posterior segment on slit lamp examination. Those with ametropia underwent an objective refraction and then a subjective refraction to determine the exact value of their correction.

2.2. Case Definition

Ametropias were divided according to their refractive value as follows: in low myopia, when it was less than −3 diopters, in medium myopia between −3 and −6 diopters, and in high myopia, when greater than −6 diopters. In low hyperopia, when it was less than +3 diopters, in medium hyperopia, between +3 and +6 diopters, in high hyperopia, when greater than +6 diopters. In low astigmatism, when it is less than +3 diopters, medium between +3 and +6 diopters and high when it is greater than +6 diopters, its axes are defined from 0 to 180 degrees.

2.3. Variables Studied, Data Entry and Analysis

The variables studied were age, sex, reason for consultation, type of ametropia diagnosed, its refractive value, its isolation and its association with other ametropias. Data entry, processing and analysis were done using Word and SPSS 25 software. Proportions were expressed in absolute or relative values.

3. Results

Out of 1678 new consultations, we collected 663 cases of ametropia, an incidence of 39.51%, which included 11.5% of myopia including 2.7% of isolated myopia, 80.8% of hyperopia including 21.0% of isolated hyperopia and 7.1% of isolated astigmatism (Table 1) with a female predominance of nearly 80% (Table 2). First-degree ametropia (<3 diopters) was dominant with 89.47% for myopia, 99.44 for hyperopia and 99.32% for astigmatism (Table 3). The most affected age group was 21 - 40 years (Table 2) with an average age of 35.86 and extremes of 6 and 78 years. Visual fatigue was the most common reason for consultation, *i.e.* 37.9% (Table 4). The average visual acuity without optical correction was 6.90/10 in the right eye and 6.79/10 in the left eye.

Table 1. Distribution of patients according to the type of ametropia.

Ametropia	n	%
Isolated myopia	18	2.71
Astigmatism + myopia	58	8.74
Isolated hyperopia	142	21.41
Astigmatism+ hyperopia	398	60.03
Isolated astigmatism	47	7.08
Total	663	100

Table 2. Distribution of patients according to age and sex.

	n	%
Age group		
0 - 20	169	25.5
21 - 40	230	34.7

Continued

41 - 60	202	30.5
60+	62	9.4
Sex		
Women	470	70.9
Men	193	29.1

Table 3. Distribution of ametropias according to their refractive value.

Refractive value	Ametropia					
	Myopia		Hyperopia		Astigmatism	
	n	%	n	%	n	%
Weak	68	89.47	537	99.44	442	87.87
Average	5	6.57	3	0.55	61	12.12
Strong	3	3.94	0	0	0	0
Total	76	100	540	100	503	100

Table 4. Distribution of patients according to reason for consultation.

Reason for consultation	n	%
Decreased visual acuity	48	7.2%
Eye pain	139	21.0
Eyestrain	251	37.9
Tearing	130	19.6
Photophobia	95	14.3
Total	663	100

4. Discussions

4.1. Frequency

During the study period, we collected 663 cases of ametropia out of 1678 new consultations, *i.e.* a frequency of 39.51%. This result is close to those found by Lam [9] in Senegal-Dakar, Pokharel *et al.* in Antananarivo in Madagascar [10], He *et al.* [2] in Guangzhou in China, Maul *et al.* [3] in Santiago in Chile, Ayed *et al.* [11] in Tunisia who found respectively 33.03%, 27%, 50.8%, 56.3%, and 57.2% prevalence. In the literature, lower results have been reported, in particular, those obtained by Pakulu *et al.*, Bourgeaois *et al.* in Türkiye, Zhao *et al.* who found respectively 11.47%, 11% and 11.3% [4] [12]-[14] prevalence. Ouedraogo and Pokharel *et al.* found respectively 5% frequency and 1.58% prevalence [15] [16], results largely lower than ours.

4.2. Age

The most affected age group was 21 - 40 years with 34.7% (n = 230) followed by

41 - 60 years with 30.9% (n = 202) and the least affected was 60 and over with 9.4% (n = 62). This could be explained by the visual requirements of younger subjects who are therefore more active in carrying out their socio-professional activities, especially with the increasing use of new information and communication technologies. As for older people, they were less affected by these refractive errors. In the study conducted by Paluku *et al*., the most affected age group is adults, age (21 - 60 years) with 73.90% and the least affected is 0 - 10 years with 0.80% [4].

4.3. Gender

Women were more affected with 70.9% (n = 470) against 29.1% (n = 193) for men. This result is consistent with that of Paluku *et al*. who reported that women were more affected with 51.30% [4]. The same results have been reported in studies carried out on child populations, including those of Gbé *et al*., Medi *et al*., Faderin *et al*., Sounouvou *et al*., and Hashim *et al*. who reported respectively, 51.7% 56% 54.47%, 52.7% and 69.4% [5] [17]-[20] in favor of the female gender. On the other hand, Diallo and Kra *et al*. reported in their study a predominance of the male gender with respectively 50.5% 50.76% [8] [21].

4.4. Reason for Consultation

Visual fatigue predominated the reasons for consultation with 37.9% (n = 251) followed by eye pain and tearing with 21.0% (n = 139) and 19.6% (n = 130) respectively. Paluku *et al*. and Kra *et al*. reported pruritus (55%) and blurred vision (35%) as the dominant symptoms respectively [4] [21]. Gbé *et al*. and Jeddi Blouza *et al*. reported headaches as the predominant reason for consultation in their studies carried out on child populations [5] [22].

4.5. The Type of Ametropia

In our series, hypermetropic astigmatism was the predominant ametropia with 60.3% (n = 398) followed by isolated hypermetropia and myopic astigmatism with 21.41% (n = 142) and 8.74% (n = 58) respectively. Our results are close to those of Gbé *et al*. who reported a predominance of hypermetropic astigmatism with 43.95% followed by simple hypermetropia with 22.54% [5]. In the work of Odoulami-Yehouessi *et al*., the most frequent ametropia was simple myopia with 32.26% followed by simple myopic astigmatism in 21 cases (22.58%) and compound in 16 cases (19.36%) [6]. Paluku *et al*. and Thera reported respectively a predominance for astigmatism with 47.86% and myopia with 43.36% [4] [23].

4.6. Refractive Value

Among the refractive errors encountered, low ametropias (<3 diopters) were the most frequent, whether it was myopia, hyperopia or astigmatism with respectively 89.47%, 99.44% and 87.87%. The same observations have been reported in the literature, particularly in the studies of Odoulami-Yehouessi *et al*. and Bourgeaois *et al*. [6] [12], with medium and high ametropias not being common.

5. Conclusion

Ametropias represent a significant portion of pathologies diagnosed in ophthalmology. It is important to know the general characteristics in order to improve the quality of life of patients affected by them through efficient therapeutic solutions. In short, this study shows a predominance of ametropias in young female subjects suffering from visual fatigue.

Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

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