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# Leukocoria in Children at the Joseph Ravoahangy Andrianavalona University Hospital-Antananarivo

RH Andriambelo[1]*, HL Randrianarisoa[2], RT Rakotoarisoa[3], Raobela L[4].

[1]*Ophthalmologist, Ophthalmology Department, CHUJRA Antananarivo Madagascar.

[2]Ophthalmologist, Ophthalmology Department CHUJRA Antananarivo Madagascar.

[3]Ophthalmologist, Ophthalmology Department CHU Anosiala Antananarivo Madagascar.

[4]Associate Professor in Ophthalmology, Ophthalmology Department CHUJRA Antananarivo Madagascar.

ABSTRACT

Leukocoria is defined as a white reflex in the pupillary area. It can reveal several intraocular pathologies. The aim of our study is to draw the epidemiological and clinical profile of the leukocoria at the Joseph Ravoahangy Andrianavalona University Hospital (CHU-JRA) in Antananarivo Madagascar and to discuss the different causes. This is a retrospective study for two and a half years including patients aged between 0 and 10 years at the Ophthalmology service of the CHU-JRA. Leukocoria was found in 40 eyes of 27 patients with a mean age of 4 years. It was unilateral in 51.84% of case. The etiologies were congenital cataract in 48.14%, retinoblastoma in 33.33% and post traumatic cataract in 18.51% of case. Leukocoria is an indicative of serious eye disease which can threaten the vision and the life prognosis in some cases. There are many etiologies made by the literature. All leukocoria should be explored to establish the diagnosis of all possible etiologies in order to ensure an adequate care for each case.

Key words:
Leukocoria,
Congenital cataract,
Retinoblastoma.

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Corresponding Author
Name: RH Andriambelo
Email: ravakandriambelo@gmail.com

## INTRODUCTION

Leukocoria is defined by a white pupil reflection. It may be the manifestation of many pathologies of the posterior or anterior segment of the eye whose the first cause is retinoblastoma [1, 2]. In children, there is a progressive development of visual acuity. It Final visual acuity is reached at the age of 8 years. Therefore, any obstacles to this development during childhood has an impact on vision[2]. So, leukocoria is an alarming and serious sign because it may involve the visual prognosis. In some cases, it can also be life-threatening depending on the etiology. That's the reason why we conducted this study. The objectives are to determine the epidemiological and clinical profile leukocoria and discuss the different causes of leukocoria.

## MATERIAL AND METHODS

We conducted our study at the Ophtalmology department at the University Hospital of Joseph RavoahangyAndrianavalona. This is a retrospective study for two and a half years, from January 2012 to June 2014. We included in our study all children aged 0 to 10 years old seen in consultation with leukocoria which have diagnosis tests in their files whose etiologies have been known. The studied parameters were the incidence, age, gender, laterality, history, the ophthalmological examination, the results of ocular ultrasound, the classification of the leukocoria and the etiologies identified at the end of the examination. Our data were analyzed by Microsoft Excel and the R software.

## RESULTS

During the study period, we identified 27 cases of leukocoria on 1049 children seen in consultation. Leukocoria was present in 40 eyes of these 27 patients. This represents 3% of children seen in consultation aged 0 to 10 years. The average age of our patients was 4 years, with extremes of 9 months and 10 years. A female predominance was observed with a sex ratio of 0.5. Leukocoria was unilateral in 51.84% of cases and bilateral in 48.81% of cases. In the history, ocular trauma was found in 18.32% of cases, the disease during pregnancy like fever in 7.40%, psychomotor developmental delay in 7.40%, convulsion and cerebral palsy in 3.70%. Our children have all benefited from an ophthalmologic examination even if the examination in children is difficult. We couldn't assess visual acuity in 48.14% of children but the white reflection of the pupil was noted in all children. The fundus of the eye was inaccessible in 70.37% of cases.

Ultrasonography was the diagnosis test prescribed in all patients to have a focus on the etiology of leukocoria. We objectified crystalline lens opacification in 66.66% of cases and the presence of tumor processes in 33.33% of cases.

In our study, we adopted the old classification leukocoria into lenticular and retrolenticular leukocoria. We found 66% of cases in the first classification and 33% for the second. After all examinations and classification, etiologies were evident. Congenital cataract predominated in 48.41% of cases, followed by 33.33% in retinoblastoma and post traumatic cataract in 18.51% of cases.

## DISCUSSION

During the period of two years and a half, leukocoria was found in 40 eyes of 27 patients representing 3% of children seen in consultation at our Ophthalmology department. In Germany, a study during 6 years 86 eyes affected by leukocoria in 58 patients [3]. This is the double of the figures we got in our study

compared to the difference in the duration of the studies. And according to Baggeren and colleagues leukocoria is a rare sign[4]. Our results are comparable to the literature data.

The average age of our children was 4 years old. In Switzerland, Luke KH and colleagues, they reported an average age ranging from 5 months to 2 and half years [5]. This shows that the age of discovery leukocoria is later in our study leading to a support delay. Madagascar is a developing country and the access to health care centers is difficult, at this is added the intellectual level and the standard of living of parents who take their children to a doctor belatedly.

A female predominace was observed both in our study and in the literature by Harlder S[6].

Regarding laterality, bilateral disease was found in 48.81% of cases and unilateral in 51.84% cases. According to Harlder S and his staff, on a 2-year study in children below 10 years have noted a bilateral involvement in 54.6% of cases[6]. Leukocoria can affect the two eyes at the same time in some etiologies. It does not also exist a large gap between unilateral and bilateral involvement of these figures.

In the background, there were pathologies during pregnancy, psychomotor development delays, with cerebral palsy and eye injuries. In the literature, authors such as Tatarella BM and colleagues gave the antecedent in their studies[7]. And according to O'Neill, there are congenital pathologies diseases which can manifest leukocoria[8]. The childhood and the prenatal life history can guide in the search for causes of leukocoria.

Clinically, visual acuity was not assessable in 48.14% of cases and leukocoria was observed in all patients. The fundus examination was inaccessible in 70.37% of cases. In children, the test is always difficult. According to some authors, this examination should be repeated in difficult child [2, 4]. When the fundus examination is inaccessible, other complementary tests are needed[9].

With the ultrasound, we objectified crystalline lens opacification and tumor formation. According to Balmer and his colleagues, ultrasound has an important place in the exploration of leukocoria[10]. And according to Funariu I, imaging test allows for the diagnosis when the fundus is inaccessible[9]. Beside this review, photography allows us to appreciate the existence of leukocoria even if it can't make the etiology[11].

During classification, lenticular leukocoria was found in 2/3 of cases and retrolenticular in 1/3 of cases. This is an old classification of leukocoria. It doesn't consider the prelenticular leukocoria with clear lens. Therefore, a new classification was proposed by Tartarella MB and colleagues. These authors classified leukocoria in prelenticular, lenticular and retrolenticular [7].

The etiologies were dominated by congenital cataract, followed by retinoblastoma and post traumatic cataract. The literature also reports the predominance of congenital cataract in Funariu's study[9]. Other authors have found as the primary causes the retinoblastoma[10]. Leukocoria in this case is the first sign of the disease[12]. Depending on the American Society of Oncology which conducted a study leading to a conclusion that all that's white is not retinoblastoma[13]. Post traumatic cataract was observed in 8% of cases in the P Meier's studies [3], which is less common compared to what we found in our study (18.51%). Alongside these etiologies, there are other causes reported in the literature, but have not found in our study, the persistence of the primary vitreous, retrolental fibroplasia, Coats disease, disease Von Hipple the Norrie disease and vitreous hemorrhage[14].

At the end of this study, we identified some limitations. The results are not representative of Madagascar; it was a single-center study. There are also some cases excluded because the patients could not afford to perform the diagnosis tests needed to determine the causes. A multi-centric study is needed to complete this one. It is also important to facilitate the access to examinations in the country and improve the vision screening in children.

## CONCLUSION

Although rare, leukocoria is an alarming sign for children. It requires the earliest possible care. There are a lot of causes whose treatment is different from case to case. These etiologies all fit under severe conditions that may threaten the vision and the vital prognosis in some cases. So, in front of any leukocoria, etiological research is very important.

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## CONFLICT OF INTEREST

Absence of conflict of interest.

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