Concomitant Child Strabismus: Clinical Forms and Treatment

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Abstract: Aim: To describe the different clinical forms of concomitant strabismus and the results of treatment. Patients and methods: Descriptive retrospective study conducted from January 2007 to December 2017 (10 years), on records children with strabismic, aged 1 to 16 in the department of Ophthalmology of the University Hospital of Brazzaville. Results: Of the 7,722 children collected during the study period, 130 had strabismus, a rate of 1.7%. Forty three (43%) children were boys and 74 (57%) were girls with a sex ratio of 0.75. The average age of the first consultation was 9.3 ± 3.2 years old (1 to 16). The age group of 2-6 years old was the most represented with 43.9% of patients. Depending on the type of strabismus we found as many convergent as divergent strabismus which affects both girls and boys. There was 72.3% monocular strabismus and 27.7% alternation. Dominance was greater on the right, 30.7% and 15.4% dominance on the left. The majority of patients had an initial angle ≥ 25 prismatic diopters (Δ), i.e. 43%, 38.5% had a deviation between 10 and 25Δ, 18.5% had a deviation between 10 and 5Δ. Ametropia was associated with strabismus in 107 patients or 82% of the cases. Optical and orthoptic treatment was prescribed in 67.7% of cases. 11 patients had deep amblyopia. After treatment 54% of the patients had a final deviation ≤ 10Δ and 29.1% had a final deviation ≥ 25 Δ. Conclusion: We found as many convergent strabismus as divergent strabismus. The most representative age group was that of 2 to 6 years old. The treatment was optical and orthoptic.

Keywords: Strabismus, Amblyopia, Optical Correction

1. Introduction

Strabismus is an ophthalmic syndrome characterized by a deviation of the visual axis of one eye relative to the other. This deviation can be constant or intermittent; It may be constant or intermittent, concomitant or not, with primary or secondary sensory changes. Its frequency is 5% in Western caucasian [1-2], in African melanoderma this frequency varies from 0.37 to 1.5 [3-5]. The seriousness of the condition stems from the fact that poorly treated, strabismus leads in a significant number of cases to unilateral amblyopia. On the other hand, when the syndrome is recognized and treated in time, this complication can be avoided. The aim of this work is to describe the different clinical forms of concomitant strabismus and the results of treatment.

2. Patients and Methods

This is a cross-sectional descriptive study conducted in the department of Ophthalmology the University Hospital of Brazzaville from January 2007 to December 2017, a period of 10 years. We collected the records of patients with concomitant strabismus seen by ophthalmologists and an orthoptist. All children benefited from an oculomotor exam and a cycloplegic objective refraction assessment according to the following protocols: either with atropine 0.3% or 0.5%
for 5, and the refraction was carried out on the 7th day; either cyclopentolate combined with tropicamide, alternating instillation every 5 minutes for 25 minutes. The skiascopy or auto-refractometry was done 20 to 30 minutes after the last drop. Ametropia was only taken into account when it was greater than 0.25 diopters.

Visual acuity was assessed on the Pigassou scale in preschoolers (between 2 and 6 years old), in school children (between 7 and 16 years old), we used the Monoyer scale. However, in children under 2 years of age, visual acuity has not been evaluated.

The deviation from strabismus was assessed using Behrens’ rule, following the Krimsky method evaluated in prismatic dioptr (∆).

An examination of the anterior segment and the fundus was also performed.

Three types of treatment were used in our study: first optical treatment alone used in strabismus with refractive error, consisting of a total optical correction; then an orthoptic treatment was associated with optical treatment when the optical component alone was insufficient, consisting of occlusions; finally a surgical treatment which aimed to restore the parallelism of the ocular axes.

The following parameters were taken into account: age, sex, type of strabismus, angle of deviation of strabismus before and after treatment.

The exclusion criteria were: incomplete record, inconcomitant, paralytic strabismus, age at onset less than 1 year and encephalopathy. The results were processed by Excel software for the analysis of the data series.

### 3. Results

We collected 130 strabismic patient records out of the 7,722 children received during the study period, a frequency of 1.7%. Forty three (43%) children were boys and 74 (57%) were girls with a sex ratio of 0.75. The average age of the first consultation was 9.3 ± 3.2 years old (1 to 16). Table 1 shows the distribution of patients by age of onset and gender. The exclusion criteria were: incomplete record, inconcomitant, paralytic strabismus, age at onset less than 1 year and encephalopathy. The results were processed by Excel software for the analysis of the data series.

| Gender | Male | Female | Total |
|--------|------|--------|-------|
| Age (years old) | Number | % | Number | % | Number | % |
| <2 | 22 | 16.9 | 12 | 9.2 | 34 | 26.1 |
| 2-6 | 18 | 13.8 | 39 | 30 | 57 | 43.9 |
| 7-10 | 14 | 10.8 | 20 | 15.4 | 34 | 26.1 |
| >10 | 2 | 1.5 | 3 | 2.3 | 5 | 3.9 |

We found as many convergent as divergent strabismus that affected both girls and boys. The distribution of strabismus by type and gender is shown in Table 2.

Strabismus was monocular in 62.3% of the cases and alternating in 27.7% of the cases.

The associated ametropias, shown in Table 3, were found in 82% of the patients. Eighteen percent of patients were emmetropic.

| Gender | Male | Female | Total |
|--------|------|--------|-------|
| Type of strabismus | Number | % | Number | % | Number | % |
| Male | 26 | 20 | 30 | 23 | 56 | 43 |
| Female | 37 | 28.4 | 37 | 28.4 | 74 | 57 |
| Total | 63 | 48.4 | 67 | 51.4 | 130 | 100 |

### 4. Discussion

The frequency of strabismus was 1.7% in our study. This frequency was slightly higher than that found by Ebana [4] in

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**Table 1. Distribution of patients by age and gender.**

**Table 2. Distribution of patients by type of strabismus.**

**Table 3. Distribution of ametropia by gender.**

**Table 4. Therapeutic modalities.**

**Table 5. Distribution according to the final deviation.**

**Table 6. Distribution according to the initial deviation.**
because 54% of cases had recovered from a physiological healing. The overall therapeutic result was satisfactory because 54% of cases had recovered from a physiological deviation ≤10Δ. Positive outcomes depend on the earliness of the treatment [19, 20] because of the age of discovery of the disease and the start of treatment generally occurring before 2 years old. The older the child gets, the worse the outcome.

5. Conclusion

Strabismus was as much convergent as divergent in equal proportions, more representative in the age group of 2 to 6 years old. The most common associated ametropia was hyperopia. The treatment reduced the strabismic angle in 35.5% of the patients.

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