

## Epidemiological, Clinical and Therapeutic Aspects of Orbital Diseases in Ophthalmologic Hospital of Saint André de Tinré (OHSAT), in Benin Republic

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### Abstract

**Introduction:** Orbital diseases are becoming world widely big concern and particularly in Benin. Their management is not usually available.

**Objective:** To study the epidemiological, clinical and therapeutic characteristics of orbital pathologies in HOSAT.

**Patients and methods:** This was a retrospective study over a period of 03 years from July 2012 to July 2015 which was conducted in OHSAT. In 03 years. One hundred and forty three (143) patients with orbital diseases were examined.

**Results:** The frequency of orbital affections had represented 0.3% of all eye diseases. Male patients were the majority with 60.8%. The most represented age group was children under 15 years old (40.6%). The main symptoms were represented by orbital pain (35.7%), inflammatory signs (35.2%), exophthalmia (30.1%), ptosis (12.8%), leucocoria (6.1%) and diplopia (4.6%). Tumors represented 43.6% of the cases, 30.8% of injuries, inflammatory diseases and dysthyroid orbitopathies 21.7% of the cases, 01 case of vascular disease suspicion (0.7%), and 01 case of congenital orbital malformations (0.7%).

**Conclusion:** Orbital diseases although infrequent represent problems for their diagnosis and the efficient and effective support at OHSAT due to several problems related to insufficient adequate technical facilities.

**Keywords:** Orbital disorders; Orbital tumors; Trauma; Inflammations

### Introduction

Orbital pathologies underestimated for a long time have become our concern nowadays due to the population explosion, the increased of life expectancy and a hostile environment. But national eye health promotion programs do not classify these pathologies among their priorities. The care of these pathologies is multidisciplinary in general [1]. The purpose of this work is to study the epidemiological, clinical and therapeutic characteristics of orbital pathologies in the Ophthalmologic Hospital of Saint André de Tinré (OHSAT) in the northern part of Benin Republic. It is the first study from this country, and also, no previous researches in what concerned the link between orbital diseases, malnutrition and pollutants had been done. The center where the study had been performed also, has limited equipment and no possibility of histological examination after tumor excision.

### Patients and Methods

It was a retrospective study over a period of three years from July 2012 to July 2015. It was held at the OHSAT.

It was a preliminary study to calculate the hospitable frequency of orbital's diseases and their clinical manifestations at OHSAT.

Were included in the study, all patients seen during the study period and who had been diagnosed with an orbital affection based on clinical examination with or without paraclinical arguments.

Orbital diseases were grouped according to the classification of Rootman [1] and endorsed by Adenis Morax [2]. This is based on the clinical, pathological and imaging characteristics. These orbital diseases are classified into five groups: "acute or chronic inflammations and thyroid exophthalmia", "acquired and traumatic congenital structural abnormalities", "degenerative", "tumor" and "vascular and hematologic diseases" [2].

For statistical analysis, the Chi<sup>2</sup> test or the Fischer test according to the case was used to compare the proportions and percentages. The risk  $\alpha$  was set at 5%. The P value was not calculated.

### Results

#### Epidemiological plan

**Frequency of orbital affections:** Out of a total of 46750 patients seen during the study period, 143 had an orbital affection. Orbital diseases represented then 0.3% of the observed eye diseases.

**Demographic characteristics:** The distribution of the patients according to age group is represented on Table 1. The average age of patients was  $25.1 \pm 20.2$  years with extremes of 05 months and 76

years. The most represented age group was the one of the children under 15 years with a frequency of 40.6%. Male gender was the most affected in our study (60.8%). The sex ratio was 1.6.

Variables	Effective	Percentage (%)
<b>Age (Years)</b>	<b>(n = 143)</b>	
<15	58	40.6
16-25	21	14.7
26-35	20	14.0
36-45	22	15.4
46-55	8	5.6
56-65	9	6.3
>65	5	3.4
<b>Gender</b>	<b>(n = 143)</b>	
Female	56	39.2
Male	87	60.8

**Table 1:** Distribution of patients according to the age and gender.

### Clinical aspects

**Functional symptoms:** In our work, the orbital affections are manifested by various symptoms including: an orbital pain in 70 patients (35.7%), signs of inflammation in 69 patients (35.2%), protrusion of the eyeball (proptosis) in 59 patients (30.1%) with 51 unilateral (26.0%) and 08 bilateral (4.1%). Ptosis, diplopia and leucocoria were less frequently encountered with respectively 12.8%; 6.1%; and 4.6% (**Table 2**).

Functional Symptoms	Effective	Percentage (%)
Orbital pain	70	35.7
Inflammatory signs	69	35.2
Exophthalmia	59	30.1
Ptosis	25	12.8
Diplopia	9	4.6
Leucocoria	12	6.1
Strabismus	3	1.5
Orbital mass	2	1.0

**Table 2:** Distribution of patients according to the functional symptoms.

**Physical symptoms:** In our study there was right eye blindness in 56 patients (43.1%) and a left eye blindness in 59 patients (45.7%); profound low vision in 03 patients (2.6%) as well as in the right eye and left eye; moderate visual right eye loss with 50 patients (38.8%) and in left eye with 46 patients (35.3%). Visual function was normal in the right eye in 20 patients (15.5%) and in the left eye in 21 patients (16.4%).

Regarding exophthalmia, it had been found in 59 patients (41.3%) with a predominance of non-pulsatile, axile, reducible exophthalmos (52.5% of cases).

As concerning slit lamp examination, the most frequent abnormalities found was chemosis in 14 cases (9.8%).

The fundus examination showed a whitish and hyperemia tumor, endophytic in 19 cases (13.3%)

The majority of patients in our series had been under no further tests.

### CT scan examination

Only 40 (28%) patients out of 143 have been able to afford the cost of this examination that is performed at far hospital where the study had been realized. Financial and geographic limitations explained this low rate of CT scan examination. Among them, 13 patients (32.5%) presented intra orbital calcification (**Table 3**).

	Effective	Prevalence
Normal	3	7.5
Intra orbital calcification	13	32.5
Fusiform tubular multi lobed Enlargement of the optic nerve	1	2.5
Thickening of the lateral oblique muscle	2	5.0
Fracture of the lamina with exophthalmia	1	2.5
Periorbital hematoma	1	2.5
Hypertrophy tapered inner and upper right muscles with respect of the tendon of insertion	1	2.5
Hypertrophy tapered inner and upper right muscles including the tendon of insertion	1	2.5
Orbital metastasis	8	20.0
extra orbital tumor of cystic appearance	2	5.0
orbital tumor with enlarged optic nerve	7	17.5
Total	40	100.0

**Table 3:** Distribution of patients according to the CT scan results.

### Etiological groups orbital affections

The orbital tumors were the most represented with 43.4%; followed by orbital trauma and inflammatory disorders of orbit with 30.8% and 21.7% respectively (**Table 4**).

Among orbital tumors, those secondarily spread to the orbit were the most frequent (25 cases). It was essentially retinoblastoma. The most observed orbital trauma were contusions (37 cases).

In the group of inflammatory conditions, acute ones (orbital cellulitis) were the most represented (22 cases), followed by dysthyroid orbitopathies (7 cases).

Congenital malformations and vascular disease were found in one patient in our series respectively.

	Effective	Percentage (%)

<b>Orbital tumors</b>	62	43.6
Tumors secondary extended	25	18.2
to orbit Metastasis	5	3.5
Indetermined forms	18	12.2
Primitive orbital tumors	14	9.8
<b>Orbital traumatism</b>	44	30.8
Contusion	37	25.9
Intra orbital foreign bodies	3	2.1
Suspicion of orbital fracture	4	2.8
<b>Inflammatory diseases</b>	31	21.7
Acute Inflammation (Orbital cellulitis)	22	15.4
Chronicle inflammation	2	1.4
Dysthyroid Orbitopathies	7	4.9
Orbital Pseudo tumor	4	2.8
Congenital malformations	1	0.7
Vascular affections (Orbital hematoma)	1	0.7

**Table 4:** Synoptic presentation per etiologies groups of orbital diseases.

#### Synoptic presentation per orbital tumors

Secondary orbital tumors were predominated (30 cases equal for 21%) than primary orbital tumors (14 cases equal for 9.8%) (Table 5).

	Effective	Prevalence (%)
Primitive orbital tumors	(n = 14)	9,8
Optic nerve glioma	7	4,9
dermoid cyst of the limbus	1	0,7
Optic nerve meningioma	2	1,4
Mucocele	1	0,7
Sarcoma of the facial structure	1	0,7
BURKITT lymphoma	1	0,7
Bilateral optic chiasma tumor	1	0,7
Secondary orbital tumors	(n = 30)	21,0
Secondary spread tumor to the orbit	25	18,2
Metastasis	5	3,5
Undetermined forms	(n = 18)	12,6

**Table 5:** Synoptic presentation per orbital tumors.

#### Therapeutic aspects

**Medical treatment:** In our series, medical treatment has been prescribed for 87 patients (60.83%). Inflammatory diseases were more treated by these means. Non steroids anti-inflammatory were most

used in eye drops and tablets with 25 patients (28.7%). Association Non steroids anti-inflammatory and antibiotic association represented 19 patients (21.8%).

**Surgical treatment:** In our series the surgical means were used in 45 patients. The enucleation was the most used surgical means for 16 patients (35.6%), followed by evisceration (24.4%), exenteration (17.8%), excision (15.6%) and incision (4.4%).

**Chemotherapy:** The molecules used in 19 patients in our series were mainly for cases of retinoblastoma, meningioma and metastasis identified (one case of Wilms tumor in a child, one case of breast tumor with clinical malignancy signs, one case of abdominal tumor with clinical malignancy signs and two unidentified forms). The cyclophosphamide (Endoxan<sup>®</sup>) was the only oncology drug used in these 19 patients.

## Discussions

### Epidemiological plan

For a total of 46750 patients seen during the study period, 143 had an orbital affection, what means a frequency of 0.3%. This frequency was significantly lower than that reported by Kaya et al. in 2006 [3] in Congo Brazzaville and Marcus Chun Jin Tan [4] in Singapore, with respectively 7.5% and 20.6% cases. This result might be explained firstly by the duration of the study period that was shorter in our study. Secondly, a significant number of patients would not have been consulted regularly in the hospital due to the geographical and financial inaccessibility to conventional medical care. Particular, the great difference between our prevalence and that of Marcus Chun Jin Tan [4] in Singapore can be explained by the difference of methods. Our study had been conducted in general ophthalmology unit, in opposite to that of Singapore conducted in oculoplasty department.

The median of patients in our study was 21.5 years and ranged from 05 months to 76 years. The most represented age group was that of children under 15 years with a frequency of 40.6%. These results were similar to those reported by Anunobi et al. [5] in Nigeria with 51.1% of cases among children under 15 years old and those of Bekibele [6] in Ibadan, Nigeria with 50% of children and young adults from 0 to 20 years old. Asad Aslam Khan et al. [7] observed in Pakistan for their study a predominance of adults with 57.47% of cases. Our findings could be explained by the significant number of retinoblastoma cases among children under 15 years old. Indeed, retinoblastoma was the most common tumor feature in our study.

Male predominated in our study (60.8%) with a sex ratio of 1.6. It was the same with the results reported by Kaya et al. [3] with 60.4% of male subjects. Anunobi et al. [5] in Nigeria also reported a male predominance in 56.0% of cases. But, in contrario a female predominance was observed by Balogun et al. [8] in Nigeria. This result could be explained by the fact that men are more prone to injury than women.

### Clinical aspects

The main symptoms are represented in our study by orbital pain (70 cases equal to 35.7%), inflammatory signs (69 cases equal to 35.2%), exophthalmia (59 cases equal to 30.1%), ptosis (25 cases equal to 12.8%), leucocoria (12 cases equal to 6.1%) and diplopia (9 cases equal to 4.6%). These symptoms are commons lesions occurring during most of orbital diseases.

In our series, these results are mostly higher than those reported by Ducrey in [9] in Switzerland with exophthalmia (37 cases equal to 26.06%), pain (25 cases equal to 17.61%), inflammatory signs (17 cases equal to 11.97%). Our results testify the advanced stage of the disease at the first consultation, which means when the pain became unbearable. Moreover Musala et al. [10] in Cameroun noted that the late diagnosis of eye tumors in the African context was related to the limited performance of health systems and inappropriate traditional long-term treatment, delaying urgent consultations to start-up adequate treatment.

### Complementary examination

As concerned complementary examinations, only 40 (28%) patients of 143 have been able to afford the cost of CT scan that is performed at a hospital far from where the study had been realized. Among them, 13 patients (32.5%) presented intra orbital calcification. Financial and geographic limitations explained this low rate of CT Scan examination. According to Eze et al. [11] diagnostic by orbito-ocular ultrasonography is a safe, affordable, and cost-effective procedure that is especially suited for poor resource developing countries.

### Etiological groups of orbital affections

The etiologies in our series were as followed: tumors (62 cases equal to 43.6%), trauma (44 cases equal to 30.8%), inflammatory diseases (31 cases equal to 21.7%), 01 case suspicion of vascular disease (0.7%) and 01 case of congenital orbital malformations (0.7%).

In international literature, orbital tumors constitute a group of diverse lesions with a low incidence in the population [12].

But in our study, tumors with 43.6% of cases had represented the main etiological group. The lack of histological examination does not allow us to determine the benignity or malignancy of these cases. This rate was higher compared to the one reported by Kaya et al. [3] in Congo Brazzaville and Balogun et al. [8] in Nigeria who had reported 3.8% and 16.0% of tumors, respectively. In our study secondary tumors were more frequent than primary tumors. This finding was different from the one made by Kaya et al. [3] in Congo Brazzaville (2.3%). While acknowledging the difficulty in determining the precise nature of orbital tumors, Morax Adenis [2] believed that secondary tumors are tumors that spread from surrounding structures and metastases were more common than primary tumors. Indetermined forms accounted for 12.6% cases in our study. This rate was higher than the one reported by Kaya et al. [3] in Congo Brazzaville with 3.6% of cases. In our series, the most represented secondary tumors were the tumors spread to the orbit. Retinoblastoma, the most common malignant eye tumor of childhood was the most represented (18.2% cases). Anunobi et al. [5] in Nigeria, Mendimi nkodo et al. [13] in 2014 in Cameroon and Asad Aslam Khan et al. [7] in 2015 in Pakistan had made the same observation with respectively 85%, 37.8% and 20.14% across all orbitofrontal eye tumors in their study. Injuries meanwhile accounted for 30.8% of disease in our work. This rate was similar to that reported by Balogun et al. [8] in Nigeria which was 30.0%. In opposite, Kaya et al. [3] reported in Congo Brazzaville a rate significantly lower than ours of 14.2% of cases. Ignorance of the rules of the road, abstention from wearing a seat belt, driving over the speed limit on the roads, no use of helmets by motorcyclists would explained these results.

Inflammatory conditions have represented 21.7% of cases in our study. This rate was lower than the one observed by Kaya et al. [3] in 2006 in Congo Brazzaville (61.8%). In contrary, this result is higher

than the 13.8% reported by Asad Aslam Khan et al. [7] in 2015 in Pakistan.

This difference between our study and the one of Kaya et al. [3] could be explained by the fact that the acute inflammatory conditions in their series regrouped orbital abscess, orbital edema and orbital cellulitis. In the literature, many studies focused on the cases of children about orbital and periorbital cellulitis [14].

In their series, periorbital cellulitis occurred more frequently (83%) than orbital cellulitis (17%). Of the children with periorbital cellulitis, 85% were younger than 5 years old, while 62% of the children with orbital cellulitis were older than 5 years old.

The frequency (4.9%) of dysthyroid orbitopathies in our study was lower than 11.6% and 26.57% respectively reported by Kaya et al. in 2006 [3] Congo Brazzaville and Nouedoui et al. [15] Cameroon.

### Therapeutic aspects

In what concerned the treatment, in our series, medical treatment has been prescribed for 87 patients (60.83%). Inflammatory diseases were more treated by these means. Orbital cellulitis represented only 15.4% of inflammatory diseases in our series, and have required medical treatment in emergency associated intravenous antibiotic in addition to non steroid anti-inflammatory. Association Non steroids anti-inflammatory and antibiotic represented in our series 19 patients (21.8%). In the cases of children the management of orbital and periorbital cellulitis had required Intravenous antibiotics only in most of the patients, but a small proportion (6%) required surgical intervention [14].

We can conclude that, orbital cellulitis is a medical emergency requiring multidisciplinary team involvement. Early diagnosis and intervention is imperative to avoid serious complications [16].

Non steroids anti-inflammatory were most used as eye drops and tablets with 25 patients (28.7%) in our series.

### Surgical treatment

In our series the surgical means were used for 45 patients. The enucleation was the surgical means most used in 16 patients (35.6%), followed by evisceration (24,4%), exenteration (17,8%), excision (15,6%) and incision (4,4%).

In the series of Ibanga et al. [17] the eyes were removed by evisceration (63.5 %), enucleation (29.9 %) and modified exenteration (6.6 %). This difference between our results can be explained by many reasons. Their study was a 10-years retrospective review of 137 patients who underwent surgical removal of eyes in a tertiary centre.

Vonor et al. [18] in Lome, which was a multicentric study had reported that Evisceration was practiced in 67% cases, enucleation in 24%, and exenteration in 9%. The method and the duration of this study can explained the difference between our results.

### Chemotherapy

The mol ecules used in 19 patients in our series were mainly for cases of retinoblastoma (13 patients), optic nerve meningioma (2 patients) and metastasis identified (one case of Wilms tumor in a child, one case of breast tumor with clinical malignancy signs, one case of abdominal tumor with clinical malignancy signs and two unidentified forms). The cyclophosphamide (Endoxan®) per os was the only drug

used in these 19 patients, and due to the fact that oncology unit is not yet available in this hospital. In the series of Lumbroso-Le Rouic L et al. [19] initial intravenous chemotherapy was necessary for 75% of cases.

## Conclusion

Orbital diseases although infrequent Ophthalmologic Hospital of Saint André Tinré become of increasing concern facing the accuracy of diagnostic difficulties, lack of technical equipment for adequate care, in an unfavorable socioeconomic context. Their diagnosis is primarily clinical with a capital contribution of para-clinical examinations etiological and extension.

Each age group is affected with prevalence in children under 15 years. The main causes are orbital tumors, orbital trauma and inflammation.

## Conflicts of Interest

Authors have declared that there are no conflicts of interest.

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