

Aetiology and demographics of unilateral proptosis in Benin City

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Abstract

Background: Proptosis is a common presentation with a broad differential diagnosis in an ophthalmic clinic. Although the aetiology of unilateral proptosis is diverse, the impact may be sight-threatening and/or life-threatening if left unaddressed.

Objective: To determine the aetiology and demographic pattern of proptosis seen in adult patients at University of Benin Teaching Hospital (UBTH) with a view to providing baseline information for improved practice.

Study Design: A retrospective chart review.

Methods: This was a retrospective chart review of all patients with proptosis at the UBTH eye clinic from January 2008 to December 2014. Information obtained included age at presentation, sex, duration of symptoms before presentation, predisposing factors and ocular and systemic examination investigations.

Results: A total of 50 patients who had proptosis were identified during the period under review with a mean age of 37.60 ± 14.25 years. The age range was 17–66 years. There were 27 (54.0%) males and 23 females (46.0%), with a female-to-male ratio of 1:1.2. The common causes of proptosis were infection (orbital cellulitis) 36.0%, neoplasm (28.0%), idiopathic (18.0%), inflammation (12%) and traumatic (6.0%).

Conclusion: Orbital cellulitis is the single most common cause of proptosis in this study.

Keywords: Aetiology, Benin City, demographics, proptosis

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Received: 23.06.2017, **Accepted:** 08.10.2017

INTRODUCTION

Proptosis is a significant finding in ophthalmology as it may compromise both the visual function and the integrity of the globe.¹ It can be defined as the forward displacement or abnormal protrusion of the eyeball. It is also referred to as exophthalmos when associated with thyroid eye disease.² Proptosis could be unilateral or bilateral, axial or non-axial as well as pulsatile or non-pulsatile. It is a common presenting symptom of a wide variety of diseases affecting

the structures in and around the orbit.³ This presentation could either be painless or painful.

The causes of proptosis could be congenital or acquired. Acquired causes include infections, inflammation, tumour, trauma, metastasis, endocrine lesion, vascular diseases and extra-orbital lesions.⁴ In all, it is usually due to orbital or extra-orbital aetiology which can also be a primary or secondary orbital pathology.⁴⁻⁶ Moreover, aetiological factors manifesting as proptosis

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Quick Response Code:	Website: www.phmj.org
	DOI: 10.4103/phmj.phmj_19_17

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How to cite this article: Kayoma DH, Uhumwangho OM, Osaguona V. Aetiology and demographics of unilateral proptosis in Benin City. Port Harcourt Med J 2017;11:166-9.

may be visual- and/or life-devastating conditions requiring immediate intervention. Given the diversity of structures in the bony orbit, proptosis can result from any abnormality of these tissues or a manifestation of systemic disease with associated challenges of determining its aetiology as well as instituting appropriate treatment.^{7,8} The causes of proptosis vary with age and gender.⁹ Furthermore, the pathophysiology of proptosis and its consequence is determined by the aetiological process in each condition.⁸ Thus, a proper evaluation of proptosis is of paramount importance in its management.⁴

The aim of this study is to determine the aetiology and demographic pattern of proptosis seen in adult patients at the Department of Ophthalmology, University of Benin Teaching Hospital (UBTH), Benin City, Nigeria. There has been no previous study on the subject, to the best of our knowledge. This will serve as baseline data for this locality.

METHODS

A retrospective review of the medical records of all adult patients who presented to the Department of Ophthalmology, UBTH, from January 2008 to December 2014 with a diagnosis of proptosis was conducted. The case files were identified from the departmental register. The age, sex, duration of symptoms before presentation, predisposing factors, ocular and systemic examination and findings were the obtained information. The results obtained was analyzed with the IBM SPSS vs 20.0 (IBM Corp. Armonk, New York, USA). The frequencies, mean and standard deviation (SD) were done and Chi-square test was used to test associations and p value of <0.05 taken as statistically significant. Ethical clearance for this study was obtained from the Ethics and Research Committee of the University of Benin Teaching Hospital, Benin City.

RESULTS

A total of 50 patients with proptosis were identified during the period under review. The age range of patients was 17–66 years, with a mean age of 37.60 ± 14.25 years, with a higher proportion (24, 48.0%) seen to be in the 16–35 years of age group. Nineteen (38.0%) were aged between 36 and 55 years and 7 (14.0%) were aged > 55 years. Over half (27, 54.0%) of the patients were males and 23 (46.0%) were females, as shown in Table 1. Proptosis resulting from infectious causes (orbital cellulitis) accounted for a higher proportion (18, 48.0%) followed by neoplastic causes (14, 28.0%), idiopathic causes (9, 18.0%), inflammatory causes (6, 12.0%) and then traumatic causes (3, 6.0%).

Of the adult patients found to have proptosis in Benin City, a higher proportion (18, 36.0%) were caused by orbital cellulitis, 9 (18.0%) were idiopathic and 6 (12.0%) were caused by optic nerve meningioma and thyroid orbitopathy each, respectively. Less than one-tenth (3, 6.0%) were found to be caused by a lacrimal gland tumour and retrobulbar haematoma, respectively. The least common causes of proptosis among adult patients in this study were nasopharyngeal tumour, sinonasal tumour, ameloblastoma, oroantral malignancy and sphenoid ridge malignancy each accounting for 1 (2.0%), respectively, as presented in Table 2. Table 3 shows that the right eye was found to be more affected (27, 54.0%) compared to the left (23, 46.0%).

Of the patients found to have proptosis resulting from infective causes, there were more males than females (10 males, 8 females). A higher proportion of adult patients who presented with proptosis resulting from neoplastic

Table 1: Age and sex distribution of patients with proptosis in Benin City (n=50)

Variables	Frequency (%)
Age group (years)*	
16-35	24 (48.0)
36-55	19 (38.0)
>55	7 (14.0)
Sex	
Male	27 (54.0)
Female	23 (46.0)

*Mean age (years) ± SD = 37.60 ± 14.25. SD: Standard deviation

Table 2: Aetiology of unilateral proptosis among adults in Benin City (n=50)

Aetiology	Frequency (%)
Inflammation	24 (48.0)
Purely orbital	
Orbital cellulitis	18 (36.0)
Systemic diseases	
Thyroid orbitopathy	6 (12.0)
Neoplastic diseases	14 (28.0)
Neurogenic	
Optic nerve meningioma	6 (12.0)
Sphenoid ridge malignancy	1 (2.0)
Epithelial cell tumours	
Lacrimal gland tumour	3 (6.0)
From adjacent structures	
Sinonasal tumour	1 (2.0)
Ameloblastoma	1 (2.0)
Oroantral malignancy	1 (2.0)
Nasopharyngeal tumour	1 (2.0)
Traumatic lesions	3 (6.0)
Retrobulbar haematoma	3 (6.0)
Idiopathic	9 (18.0)
Idiopathic	9 (18.0)

Table 3: Eyes involved in diagnosis (n=50)

Eyes involved	Frequency (%)
Right	27 (54.0)
Left	23 (46.0)

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diseases (8, 57.1%) were males compared to females (6, 42.9%). More females (4, 66.7%) were found to have an inflammatory cause of proptosis than males (2, 33.3%).

All patients who presented with proptosis resulting from traumatic lesions were males (3, 100.0%) and more females 5 (55.6%) were found to an idiopathic cause of proptosis; the association between aetiology of proptosis among adult patients in Benin City and sex was not statistically significant ($P = 0.417$). Eleven (45.8%) of the patients presenting with proptosis that had inflammation as an underlying aetiology belonged to 16–35 years of age group; 10 (41.7%) and 3 (12.5%) were of 36–55 years and >55 years of age group, respectively. Half (7, 50.0%) of the patients who presented with proptosis caused by neoplastic lesions belonged to the 16–35 years age group. A higher proportion (4, 44.4%) of patients who had proptosis from idiopathic causes were aged between 36 and 55 years and the least proportion (2, 22.2%) belonged to the >55 years of age group. All patients (3, 100.0%) presenting with proptosis resulting from traumatic lesions were aged between 16 and 35 years as presented in Table 4. In Table 5, the association between aetiology of proptosis among adult patients in Benin City and age group was not statistically significant ($P = 0.659$).

DISCUSSION

This study shows that more males 27 (54.0%) were affected compared to females 23 (46.0%). This is comparable to the findings of Khan *et al.*⁹ and Sharma *et al.*,¹⁰ where they

both found a male-to-female ratio of 2:1. However, Zaidi¹¹ found female predominance (1.1:1) while Otulana *et al.*,¹² Naidu *et al.*¹³ and Kishor and Saptua Chingsuingamba¹⁴ found equal sex distribution in their studies.

The most common cause of proptosis in this study is infective conditions (36%), with orbital cellulitis being the most common cause. This finding is similar to some previous studies.^{10,12,15-18} In addition, thyroid orbitopathy accounted for most cases of proptosis reported by Naidu *et al.*¹³ and Kishor *et al.*¹⁴ On the contrary, Masud *et al.*¹⁹ and Sabharwal *et al.*⁴ found neoplasms as the most common cause of proptosis. The varied aetiology in these studies may be explained by age and geographical area distribution as infective causes predominate in the paediatric age group and developing countries.¹⁶ In this study, neoplasms constitute 28% of the causes of proptosis. This is in variance with Ogbeide *et al.*²⁰ who found a high percentage of tumours (81.8%) in the same centre. The variance may be because their study was a radiological study, and as such, radiological investigations would have been requested by other units in the hospital and also from peripheral hospitals. In addition, most of the tumours seen in their study were extra-orbital with secondary orbital involvement. Similarly, Komolafe *et al.*²¹ found that proptosis accounted for 53.8% of ophthalmic referrals from the ear, nose and throat ward of a tertiary hospital, with 42.6% diagnosed of sinonasal tumours. The proximity of the orbit to other craniofacial structures makes it susceptible to this effect. Thus, proptosis may be a pointer to diseases of adjacent structure requiring multidisciplinary approach. However, it is higher than the observation of Nithin *et al.*²² (18.5%). The only traumatic cause of proptosis seen was retrobulbar haematoma (6.0%). This was also similar to other studies.^{10,14,17,22} Ogbeide *et al.*²⁰ and Nithin *et al.*²² found a higher percentage (12.1% and 13.0%, respectively). In this study, all the patients seen were males (6.0%). Other studies also had a male preponderance.^{20,22} This could be attributed to the fact that males are more involved in manual jobs and aggressive plays. The right eye was more involved (54.0%). Sharma *et al.*¹⁰ also found the same in their study.

Table 4: Aetiology of proptosis against sex among adults in Benin City

Aetiology	Sex (n=50)		Test statistic
	Male frequency (%)	Female frequency (%)	
Inflammation	12 (50.0)	12 (50.0)	Fisher's exact=3.097 P=0.417
Neoplastic diseases	8 (57.1)	6 (42.9)	
Traumatic lesions	3 (100.0)	0	
Idiopathic	4 (44.4)	5 (55.6)	

Table 5: Aetiology of proptosis against age group among adults in Benin City

Aetiology	Age group in years (n=50)			Test statistic
	16-35, frequency (%)	36-55, frequency (%)	>55, frequency (%)	
Inflammation	11 (45.8)	10 (41.7)	3 (12.5)	Fisher's exact=4.365 P=0.659
Neoplastic lesions	7 (50.0)	5 (35.7)	2 (14.3)	
Traumatic lesions	3 (100.0)	0	0	
Idiopathic	3 (33.3)	4 (44.4)	2 (22.2)	

Although aetiology of proptosis may remain unknown despite standard laboratory tests and imaging studies in some cases, we report idiopathic causes of proptosis in 18% of cases. Some of these may be accounted for lack of follow-up visit as well as cost of the investigations required to establish diagnosis. The challenge of healthcare costs in managing proptosis was reiterated by Onakpoya *et al.*²³ This underlies the challenge of eye care delivery in resource-limited countries where majority lives below poverty line and health insurance coverage is lacking for optimal care delivery.

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CONCLUSION

Although the aetiology and demographic pattern of proptosis differ among populations, orbital cellulitis is the most common cause of proptosis in our study. Healthcare cost may be a daunting challenge to the delivery of utmost care for the patients.

Financial support and sponsorship

Nil.

Conflicts of interest

There are no conflicts of interest.

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