ORIGINAL ARTICLE

Spectrum of Eyeball Diseases in Patients Presented to Mayo Hospital, Lahore

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ABSTRACT

Aim: To determine the frequency of Eyeball diseases in patients presented to Mayo Hospital, Lahore and their clinicopathological profile including their demographic features (e.g. age, gender) and histo-pathological features (e.g. laterality, optic nerve involvement etc.).
Methods: A retrospective descriptive cross- sectional Study has been conducted Department of Pathology, Mayo Hospital, Lahore after the approval from the ethical review committee. This retrospective study is conducted from the cases of histo-pathological analysis of eyeball cases from the period of January 2014 to December 2018. The total sample size is 51 and sampling technique is non probability purposive sampling
Results: In this study it is found that most of the patients lay in the age group of 0-10 years (51.0%) followed by the patients lying in the age group pf 41-50 years (11.8%) third group frequency wise was of 51-60 years (9.8%) out of which about 66.7% were male and 33.33% were female. In more than half i.e. (56.9%) cases left eye was affected and rest of the cases i.e. (43.1%) were of right eye biopsies. Extraction method used in majority of the cases was enucleation (51.0%) and exenteration was performed in lesser (49.0%) cases. The spread of disease up to optic disc and optic nerve was only in 31.4 % cases. Malignancy took the light (82.4%) from benign conditions (17.6%) out of which retinoblastoma was the most prevalent (43.1%) melanoma (17.6%) and other diseases made the rest.
Conclusion: Eyeball diseases have diverse etiologies with retinoblastomas and melanomas presiding over others and are rarely spread to other parts of orbit and face, occurring prevalently in males in their early and middle ages.
Key words: Histo-pathology, retinoblastoma, malignant, etiology.

INTRODUCTION

Eye diseases or disorders are common among people of all ages ranging from children to old. Eye diseases can be defined as an impairment or abnormal functioning of eye which leads to visual disturbance. Most of the eye diseases causes blurred vision whereas severe cases leads to blindness[1]. With advancing age, the normal function of eye tissues decreases and there is an increased incidence of ocular pathology[2].

There is no general or broad criteria for classifying eyeball diseases, however they may be classified on the basis of locality of disease, causative factor (Bacterial, fungal, viral), Malignant and Non-malignant diseases. According to Parson's Diseases of the Eye by Stephen J.H.Miller they are classified as diseases of conjunctiva, cornea, sclera, uveal tract, lens, vitreous, retina, optic nerve and tumours, injuries & visual disturbances[3].

With advances in field of ophthalmology it is now possible to extract the masses completely. Surgical procedures in the removal of an eye are classified into three general categories: Evisceration, enucleation, and exenteration[4]

According to a study of 573 cases in 2015 at a tertiary care centre, China. Trauma was the top one (65.62%) in original protopathies followed by neoplasm (13.44%) and ocular infections (5.76%)[5].

The ocular defects were more frequently observed in the young male population (66%). Trauma (46%) and pathogenic (44%) causes were the main reasons over nonspecific (8%) and congenital (2%) reasons[6]. Retinoblastoma and melanoma are still the primary types of malignant neoplasms, resulting in the majority of removal of the eyes among children and adolescents[7,8].

The subject matter of eyeball diseases occupies a central place in our society especially because of the primary and secondary health hazards e.g. unhygienic medical practices and environmental pollution etc. This topic is rather diverse and we aim to discuss some broad key parameters in getting the true know how of pathological importance of Eyeball diseases.

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METHODOLOGY

The study design is Retrospective Descriptive cross-sectional Study which is set in Department of Pathology, Mayo Hospital, Lahore during the duration of January 2014 to December 2018. The sampling technique used is Non Probability Purposive Sampling and the inclusion criteria used for subjects' selection included the diseases for which the samples were submitted by patients who were presented to the Pathology Department Mayo Hospital, Lahore from January 2014 to December 2018 whereas exclusion criteria included patients who were found without any significant eyeball changes indicating absence of any and all kinds of eyeball disease.
Data collection & analysis: Data on a range of demographic, morphological and histo-pathological features was captured using a structured pretested, standard Performa at baseline. The variables in our study will be; Age of patient, Gender of patient, Laterality of

Eyeball Disease, Extraction Method, Optic Nerve Involvement, Diagnosis on the Basis of Infectious, Tumorous and Non-tumorous & the Mass being Benign or Malignant. Data was entered and analyzed using statistical package for the Social Sciences (SPSS) version 23. Data was summarized using mean and standard deviation for quantitative variables like age of patient, and frequency and percentage for qualitative variables like gender of patient and laterality of eyeball disease.

RESULTS

A total of 51 eyeball biopsies were studied at Department of Pathology, Mayo Hospital Lahore which spanned over a period of 5 years (January 2014 to December 2018). The frequency of cases ascended as with the years with the exception of 2015 in which there were more cases than any other year of the study 2014 (cases 6), 2016 (case 8), 2017 (cases 9), 2018 (cases 11) and 2015 (cases 17

Table 1 depicts the age in relation to gender ratio first group i.e. 0-10 years 26(51%) followed by the patients lying in the age group 41-50 years 6(11.8%) third in the category were the people of age 51-60 years 5(9.8%) after this patients with years 21-30 4(7.8%) rest of the groups i.e. age of 10s, 30s and more than 70 were 5.9% each with a frequency of 3 cases. Acc to our data males were more affected in the period of discussed 5 years i.e.34 (66.7%) and females with lesser occurrence stood at 17(33.3%).

Table 2 depicts the uni-focal tabular analysis of the laterality of eyeball affected with left prevalent 29(56.9%) and right eyes were 2nd of two 22(43.1%.

Table 3 explains the extraction methods used for eyeball, our data tells that enucleation was used more times 26(51%) as compared to exenteration 25(49%) which was 2nd of the two.

The spread of disease to optic nerve was observed and it was found that it was involved in lesser no. of cases 16(31.4%) and was not damaged or affected in more 35(68.6%) with a cumulative percentile of 100%.

Table 5 elaborates that whether the mass was locally invasive (malignant) or benign. In 82.4% mass was malignant (n = 42) and rest of cases were benign 9(17.6%)

Table 6 depicts the age vs diagnosis in a cross-tabulation manner. According to it retinoblastoma was the number one diagnosis 22(43.1%) in the observed period of time occurring almost invariably in children under 10 years of age, secondly melanoma was most frequent with a percentage of 9(17.6%) and was most prevalent in patients of age group 41-50 years. The cases of infection pathology were third in line with a percentage of 6(11.8%) showing a distributed prevalence in children (0-10 years), teenagers (11-20 years), young-aged (21-30 years) and middle-aged patients. Squamous cell carcinoma was the next most commonly occurring condition with a percentage of 5(9.8%). The remaining diseases were less common with stats as follows: rhabdomyosarcoma (7.8 %, n = 4), trauma and basal cell carcinoma 2(3.9% and cyst 1(2%).

Table 1: Cross-tabulation of Age (Group) and Gender of Patients with Eye-ball diseases.

	Gender		
Age Group	**Male**	**Female**	**Total**
0-10	17	9	26
11-20	2	1	3
21-30	2	2	4
31-40	3	0	3
41-50	4	2	6
51-60	5	0	5
61-70	1	0	1
>70	0	3	3
Total	34	17	51

Table 2: Laterality of the eyeball affected.

Laterality	**Frequency**	**Percent**
Unilateral Left	29	56.9
Unilateral Right	22	43.1
Total	51	100.0

Table 3: Method used for eye ball extraction

Extraction Method	**Frequency**	**Percent**
Enucleation	26	51.0
Exenteration	25	49.0
Total	51	100.0

Table 4: Involvement of Optic nerve

Optic Nerve Involvement		**Frequency**	**Percent**
	Present	16	31.4
	Absent	35	68.6
	Total	51	100.0

Table 5: Malignancy of the mass

Malignancy	**Frequency**	**Percent**
Benign	9	17.6
Malignant	42	82.4
Total	51	100.0

Table 6: Cross-tabulation analysis of age and diagnosis.

Age Group	**DIAGNOSIS**								
	Infection	**Trauma**	**Cyst**	**Retinoblastoma**	**Rhabdomyosarcoma**	**Sq. Cell Carcinoma**	**Melanoma**	**Basal Cell Carcinoma**	**Total**
0-10	1	0	1	22	2	0	0	0	26
11-20	1	1	0	0	0	0	1	0	3
21-30	2	0	0	0	0	2	0	0	4
31-40	1	1	0	0	1	0	0	0	3
41-50	0	0	0	0	1	1	4	0	6
51-60	1	0	0	0	0	1	2	1	5
61-70	0	0	0	0	0	1	0	0	1
>70	0	0	0	0	0	0	2	1	3

DISCUSSION

Eye as a matter of fact is an organ quite vital to normal orientation and vision though "vitalities" of the body are not quite affected by its diseases still it's an important part of a healthy person's daily life. Spectrum of eye diseases consist of wide diverse bands requiring descriptive, differential and demographic analysis of data to explain various dimensions and parameters of these pathologies and in fact our study spanning over 5 years though not a pioneering step in this regard yet provide a good statistical analysis to chart the incidence and expectance of such diseases through various cross-tab charts. Our study comprises 51 cases of biopsy taken from Pathology Department, KEMU, Lahore.

Gender distribution of eye diseases places males above females in being affected for indefinite reasons that may be related to their genetics, lifestyle, eating habits to a smallest possible extent and many unclear and undefined reasons. Comparable with our results in this regard are the findings of another study conducted in Jordan acc. to which anophthalmic surgery was done for 68 eyes of 67 patients during the study period. Forty-three patients (64 %) were men, and rest (36 %) were females [9].

Laterality of the eyeball in relation to any disease was found to be non-specific however in overall all the cases the left eyeball was more involved (56.9%) as compared to the right eyeball (43.1%) which again can be associated with many factors including several of the risk factors such a trauma etc. discussed above. In Jordan a study spanning over a period of 5 years found that sidedness of disease, still unrelated to any specific pathology, was more to the right 40(59%)[9].

Age in our study was discussed in relation to gender and in relation to diagnosis. Male children with age under 10 years (51%) were found to be most affected by tumors of eye ball and especially the count of retinoblastoma in children had a high toll count. Second in line were middle aged patients (11.8%) presenting most commonly with melanomas. One of our findings is consistent and other is in contrast to a review of cases of enucleation conducted in Beijing, China which stated in malignant mass group, there were 206 cases of retinoblastoma and 144 cases of melanoma. Retinoblastoma was the commonest tumor in children (206/211) and melanoma was the commonest tumor in adult (144/181)[10].

Another criterion commonly expressed while discussing infectious and tumorous diseases of eyeball is the extraction method used. In our department we found data regarding enucleation and exenteration in which enucleation was fractionally more adopted than exenteration (1.04: 1)

Extraction method is an important parameter that needs to studied in abundance fortunately this has been the case in the last decade or so. There are specific cases for which specific method is used the abundance of that very pathology in relation to the method adopted is of profound importance because in third world countries and BHUs where not much advances in technology and equipment is present, alternatives are adopted which definitely have risks association i.e. the mass is not completely resected and keeps on spreading even after surgery.

A study conducted in Asian Indian patients in 2018 studied enucleation in relation to specific disease stated that the enucleation was performed on patients of benign tumor 22(1%), malignant tumor 1472(73%), acute trauma 93(5%), inflammatory/infective pathology 33(2%) which makes a total of 81.0% that is comparable to our study with small discrepancy because of the prevalence of different causative factors[11].

A mass in eye can push eye according to its own location, because orbit is a rather congested cavity any mass with hateful malignancy can spread to other neighboring structures. However, the reality is quite the opposite the masses as they grow even a bit make the person having a quite unusual look and so they present early in their development i.e. when they have not spread to other areas. Optic nerve involvement usually endangers the vision and that is indeed our next criteria. The involvement of optic nerve was in just above 30% of the patients while in rest of the cases the optic nerve was not affected and totally healthy. This is one of the advantages of our study, optic nerve involvement hasn't been quite discussed and the reason we present to discuss that is the importance of its involvement in relation to vision. We claim that it is an important criterion at-least for studying the tumors of the eye.

The spectrum of eye diseases was studied whether tumorous or non-tumorous. Tumors of eye are congenital as well as acquired distributed unevenly over the patients of different ages however tumors were found to have malignant as well benign character shouting the fact that in our country currently the cancers are the more prevalent and malignancy with hateful character was found in almost 83% of patients this finding is related to another study conducted in a local eye center in Beijing acc. to which Intraocular malignant masses and suspected cases of cancer constituted a large part of the eye patients[10] another analysis by Anna S. Kitzmann, Amy L. Weaver, MS was also found to be of the same view , malignant neoplasm was the most common diagnosis related to the removal of an eye[12].

Retinoblastoma and malignant melanoma were the most common cancers in children and adults, respectively. The ratio of retinoblastoma to malignant melanoma was 1.43 : 1 acc. to a study in China[10]This can be applied to our study as well because our sample pool displayed a relatable proportion with retinoblastoma taking the lead in 22 of 51 cases and melanoma of the eyeball finishing second with a frequency of 9 cases while including eyeball cancers we also expanded our research to eyelid tumors and it was found that squamous cell carcinoma was found to be prevalent with basal cell carcinoma coming second this was found in contrast to studies in USA and UK which stated that the most common malignant eyelid tumor in the United States and the United Kingdom is reported to be the basal cell carcinoma which occurs most frequently on the lower eyelid and medial canthus in elderly patients[13,14].

RECOMMENDATIONS

Awareness should be spread in masses about the healthcare of eyes in our society. Parents should be made

aware about the handwashing of their children to avoid bacterial and viral infections and about consulting doctors for regular screening especially in persons having familial history. Diets should be rich in vitamins and fruits also minerals therefore care should be taken in eating habits.

CONCLUSION

Eye cancers along with infectious eye diseases are the predominant cause of blindness among masses with male gender affected more (66.67%) and the children under age of 10 (51.0%) were almost invariably presenting with complaint of eyeball protrusion diagnosed as retinoblastoma (43.13%) however eyelid tumors such as SCC (9.8%) and BCC (3.9%) were also found frequently but not spreading beyond eyeball in most cases.

Limitations: This study is retrospective observational study that does not cover the entire demographic of the said area but was performed while restricted to the Department of Pathology, Mayo Hospital, Lahore. The patients who were found without any significant eyeball changes indicating absence of any and all kinds of eyeball disease were excluded from the study.

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