ISSN: 2091-2749 (Print)
2091-2757 (Online)

Clinico-histopathological analysis of orbito-ocular lesions: a hospital-based study

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Submitted
15 Dec 2019

Accepted
28 Dec 2019

How to cite this article
Santosh Upadhyaya Kafle, Mrinalini Singh, Prerna Arjyal Kafle, Bal Kumar KC, Sanjeev Kumar Yadav, Anadi Khatri KC. Clinico-histopathological analysis of orbito-ocular lesions: a hospital-based study. Journal of Patan Academy of Health Sciences. 2019Dec;6(2):39-44.

Abstract

Introductions: Preoperative diagnosis of orbital and ocular lesions is necessary for optimum treatment. The study aims to analyze the histomorphological spectrum of orbito-ocular lesions and to evaluate the need of ancillary techniques for confirmation of diagnosis.

Methods: A cross sectional hospital based study of orbito-ocular surgical biopsy samples obtained in the Department of Pathology, at Birat Medical College Teaching Hospital, Nepal during one-year period was analysed for clinical and histopathological findings. Demographic data, site and tissue type, benign or malignant, recommendations for special stains and immunohistochemistry panel study were analysed.

Results: Out of 185 total samples, male to female ratio of 1.1:1, age ranged from ten month to 82 years, 11-20 year age group had 39 (21.1%) orbito-ocular lesions and cornea-conjunctiva was involved in 104 (56.2%). Clinical diagnosis correlated well with histopathological diagnosis, $p<0.001$. The non-neoplastic, benign and malignant lesions were 36.7%, 33.5% and 29.7% respectively. Squamous cell carcinoma was seen in 28 (50.9%) of malignant lesions followed by sebaceous carcinoma 7 (12.7%). The special stains and immunohistochemistry panel was recommended in 38 (20.5% and 21 (11.3%) cases respectively.

Conclusions: Findings suggest the clinical and histopathological diagnosis correlated well in diagnosis of a wide spectrum of orbito-ocular lesions.

Keywords: ancillary techniques, clincio-pathological correlation, immunohistochemistry, orbito-ocular lesions, squamous cell carcinoma

Introductions

The eye proves to be a unique and special sensory organ of our body exhibiting diverse histologic structures. The clinical features, signs and symptoms related to ocular diseases mimic or even simulates the commonly existing benign or non-neoplastic conditions posing difficulties in diagnosis and treatment. There is variation in pattern and frequency due to geographical locations.[1] The variation with its neighbouring tissues is diagnosed by ophthalmic pathology, sub-specialty of pathology and ophthalmology.[2] The target of ophthalmic pathology service is to increase the communication between the ophthalmic surgeon and pathologists.[3]

The complete spectrum of orbito-ocular surgical biopsies reported in literature is few and rare in our part of world.[3] The present study analyze the histomorphological spectrum with clinico-pathological correlation of orbito-ocular lesions, and the recommendation vs actually ancillary techniques like immunohistochemistry (IHC) for confirmation of diagnosis. The outcome may help clinicians in planning and implementing the strategy for diagnosis and management in local scenario.

Methods

This was a hospital based cross-sectional study of prospectively collected data for a period of one year during January 2017 to December 2017 at Birat Medical College and Teaching Hospital, Morang, Nepal. The institutional permission was obtained. All consecutives orbito-ocular surgical samples received for histopathological examination during the period was included. Clinical details (age, gender and site of involvement) were recorded from the case sheets. Histopathological diagnosis, clinical profile (size of the lesion, past surgical history, clinical and radiological diagnosis) and ancillary techniques (special stains and IHC) recommendations were recorded. Data was analysed for association of demographical characteristics (age, sex) and correlation of clinical and histopathological diagnosis.

As per our hospital practice, the specimens were fixed in 10% formalin solution. Gross examination of sample for its size, shape, color and consistency was done. Representative areas of tissue of surgical specimens were sectioned and processed in an automated tissue processor for overnight schedule of 16-18 hours. Paraffin blocks were made, trimmed the tissue sections of 5-7 mm cut and floated in water bath at 45°C and then taken on albuminized slides. The slides were then examined under light microscope after hematoxylin and eosin stain.

The clinical and histopathological diagnosis both were categorised into non-neoplastic and neoplastic (benign, malignant) and descriptively analysed with MS excel and SPSS. Inferential statistics (chi-square test and Spearman's rank correlation) were used for correlation between clinical and histopathological diagnosis. The ancillary techniques (special stains and IHS panel) recommendations for diagnostic confirmation were correlated with histopathological examination using Pearson's chi-square test.

Results

Out of 185 orbito-ocular lesions, samples from male were 98 (53%) and 39 (21.1%) were in age group 11-20 years, Table 1. Out of 68 (36.8%) non-neoplastic type, inflammatory lesions were 35 (51.5%), followed by cystic 20 (30.3%), infectious 7 (14.9%) (rhinosporidiosis five, molluscum contagiosum and cystecercosis one each) and simple descriptive report without malignancy 6 (12.8%). Out of 117 neoplastic, 62 (53%) were benign and 55 (47%) were malignant, Table 2. In ophthalmic lesions, corneo-conjunctival were 104 (56.5%) followed by eyelid 66 (33.8%), Table 3.

The correlation between clinical and histopathological diagnosis revealed strong positive correlation, p-value <0.001, Table 4. The ancillary techniques of special stains was

recommended in 38 (20.5%) and IHC panel study in 21 (11.3%) for diagnostic confirmation and revealed a positive correlation (p <0.001), Table 4.

Both the clinical and histopathological diagnosis made in the study were categorized individually as benign, malignant and non-neoplastic variables. The correlation between clinical and histopathological diagnosis was then calculated by using Spearman's rank tests, revealing Spearman's correlation ρ= 0.630, p<0.001 (significant).

Table 1. Demographic profile (age, sex) of orbito-ocular lesion

Age group	Male (%)	Female (%)	N (%)
< 1	1 (0.5%)	0	1 (0.5%)
1-10	10 (5.4%)	10 (5.4%)	20 (10.8%)
11-20	16 (8.6%)	23 (12.4%)	39 (21.1%)
21-30	22(11.9%)	10 (5.4%)	32 (17.3%)
31-40	13 (7.%)	15 (8.1%)	28 (15.1%)
41-50	5 (2.7%)	10 (5.4%)	15 (8.1%)
51-60	14 (7.6%)	6 (3.2%)	20 (10.8%)
61-70	11 (5.9%)	8 (4.3%)	19 (10.3%)
71-80	6 (3.2%)	4 (2.2%)	10 (5.4%)
>80	0	1 (0.5%)	1 (0.5%)
Total	**98 (53%)**	**87 (47%)**	**185 (100%)**

Table 2. Histologic types of neoplastic orbito-ocular lesions

Benign Lesions	N (%)	Malignant Lesions		N (%)
Apocrine cystadenoma	1 (1.6%)	Basal cell carcinoma		4 (7.3%)
Deep benign fibrous histiocytoma	1 (1.6%)	Conjunctival intraepithelial neoplasia (CIN)		7 (12.7%)
Dermoid cyst	7 (11.3%)	Grade I	3	
Fibroma	1 (1.6%)	Grade II	4	
Hemangioma	7 (11.3%)	Carcinoma		35 (63.6%)
Lipodermoid	8 (12.9%)	Sebaceous carcinoma	7	
Neurofibroma	1 (1.6%)	Squamous cell carcinoma in situ (SCCIS)	12	
Nevus	17 (27.4%)	Squamous cell carcinoma	16	
Compound nevus 6		Melanoma		3 (5.4%)
Epidermal nevus 1		Conjunctival	2	
Intradermal nevus 9		Choroidal	1	
Spindle cell nevus 1		Lympho proliferative disorder		1 (1.8%)
Ocular Melanocytosis	1 (1.6%)	Lymphoma Non-Hodgkins		4 (7.3%)
Pyogenic granuloma	9 (14.5%)	Retinoblastoma		1 (1.8%)
Sebaceous adenoma	1 (1.6%)			
Seborrhoeic keratosis	2 (3.2%)			
Squamous cell papilloma	2 (3.2%)			
Syringocystadenoma papilliferum	1 (1.6%)			
Verruca keratosis	2 (3.2%)			
Verruca vulgaris	1 (1.6%)			
Total	**62 (100%)**	**Total**		**55 (100%)**

Table 3. Prevalence of different Corneal & Conjunctival and Eyelid lesions

Corneal & Conjunctival lesions	N (%)	Eyelid lesions	N (%)
Granulomatous inflammation	19 (18.3%)	Granulomatous inflammation	07 (10.6%)
Cyst	17 (16.3%)	Nevus	05 (7.6%)
Squamous cell carcinoma in situ	12 (11.5%)	Sebaceous carcinoma	04 (6.1%)
Squamous cell carcinoma	11 (10.6%)	Cyst	03 (4.5%)
Lipodermoid	06 (5.8%)	Pyogenic granuloma	03 (4.5%)
Nevus	05 (4.8%)	Hemangioma	03 (4.5%)
Pyogenic granuloma	05 (4.8%)	Rhinospordiosis	02 (3%)
Descriptive (Benign)	04 (3.8%)	Basal cell carcinoma	01 (1.5%)
Conjunctival intraepithelial neoplasia Grade II	04 (3.8%)	Descriptive	01 (1.5%)
Conjunctival intraepithelial neoplasia Grade I	03 (2.9%)	Squamous cell carcinoma	01 (1.5%)
Calcinosis	03 (2.9%)	Seborrhoeic keratosis	07 (10.6%)
Rhinosporiodiosis	02 (1.9%)	Rosai Dorfman disease	05 (7.6%)
Hemangioma	02 (1.9%)	Syringocyst adenoma papilleferum	04 (6.1%)
Melanoma	02 (1.9%)	Verruca vulgaris	01 (1.5%)
Non-Hodgkins Lymphoma	02 (1.9%)	Lymphoma	01 (1.5%)
Molluscum contagiosum	01 (1%)	Verrucoid keratosis	01 (1.5%)
Apocrine cystadenoma	01 (1%)	Deep benign fibrous histiocytoma	01 (1.5%)
Squamous cell papilloma	01 (1%)	Squamous papilloma	01 (1.5%)
Cysticercosis	01 (1%)		
Fibroma	01 (1%)		
Basal cell carcinoma	01 (1%)		
Lymphoproliferative lesion	01 (1%)		
Total	**104 (100%)**		**66 (100%)**

Table 4. Cross tabulation between recommendations made with the histopathological examinations (using Pearson's chi-square tests)

		Recommendations			p
		No	IHC	Special stain	
Histopathologic examination	No	43 (86.0%)	5 (10.0%)	2 (4.0%)	<0.001*
	IHC	40 (70.2%)	15 (26.3%)	2 (3.5%)	
	Special Stain	42 (53.8%)	2 (2.6%)	34 (43.6%)	
	Total	125 (67.6%)	22 (11.9%)	38 (20.5%)	

IHC= immunohistochemistry, *the test result is significant at p<0.05

Discussions

Out of 185 orbito-ocular lesions, highest incidence of 39 (21.1%) were found in 11-20 year age group, and bimodal appearance with lowest incidence in less than one year and above 80 years. This in contrast to the highest incidence in 0-9 years[4] and 31-40 years[2] and lowest in the age group of 81-90 years[3].

Our findings of slightly higher (53%) involvement in males than females (47%) has been reported in literature with 50.4% males and 49.6% females respectively.[3] Also we found, male preponderance (11.9%) in 21-30 age group and female (12.5%) in 11-20 years, similar to reported male preponderance (11%) in 21-30 year age group but different in female showing higher (10%) in age group of 31-40 and 41-50 years.[3]

We found 68 (36.76%) non-neoplastic unlike the reported higher incidence of non-neoplastic lesions in the literature.[4] This was probably due to the high incidence of rhinosporidiosis infection, 81 (31%) in their study. The prevalence of eighty-two ocular rhinosporidiosis in Eastern Nepal is reported[5], which was claimed as being first to document and report such kind in Nepal.

The benign neoplastic lesions were more common 62 (54.4%) in our study, similar to other studies with more benign lesions (70%).[2,3] However, higher incidence of malignant lesions has been reported in literature.[4,6,7] Our study showed the melanocytic nevus (27.4%) was highest number followed by benign vascular tumors, hemangioma and pyogenic granuloma. Nevus being most common (70%) among benign neoplastic lesion was also reported in other study.[8]

We found squamous cell carcinoma being most common malignancy followed by sebaceous carcinoma, Table 2 and 3. This is in contrast to report of retinoblastoma being the most common malignant neoplasm followed by sebaceous carcinoma and squamous cell carcinoma.[4] In a series from Pakistan[6], retinoblastoma was the commonest lesion followed by squamous cell carcinoma of conjunctiva and basal cell carcinoma. Differently, basal cell carcinoma was the commonest malignant neoplastic lesion followed by squamous cell carcinoma and melanoma respectively in another study.[8] Yet another study reports squamous cell carcinoma as the commonest being 33.5%.[10] The findings of retinoblastoma in our study was low, similar others study from Nepal.[1] In contrast, a high percentage of malignant orbito-ocular lesions, retinoblastoma constituting 40.1%, 31.7% and 32% have been reported.[4,10,11]

We found conjunctiva lesion being the most common (56.2%) followed by the eyelid (35.7%) similar to the other series.[1,9] Among the malignant corneo-conjunctival lesions, the squamous cell carcinoma (11.5%) including squamous cell carcinoma in situ (16.3%) was commonest in our study, similar to other studies.[1,2,12]

Regarding the distribution of the orbito-ocular lesions within eyelid regions in our study, the granulomatous inflammation (19.7%) was the commonest followed by nevus (16.7%), and vascular tumors (13.7%). Another study from Nepal[3] reports dermoid cysts (21%) being commonest lesion followed by epidermal inclusion cysts (14%) and intradermal nevus (12.2%). The basal cell carcinoma (4.5%) was in the highest number for malignant eyelid lesions in our study, similar to others.[13,14] Besides, few rare diseases like Rosai Dorfman disease, Syringocystadenoma papilleferum and deep benign fibrous histiocytoma were seen as eyelid lesions in our study.

The clinical diagnosis was consistent with the histopathological diagnosis in 120 (65%) cases in our study, slightly less than reported findings of 84%, 91.5% and 96% respectively.[15-17]

Our study revealed the ancillary techniques recommendation for special stains in 38 (20.5%) and immunohistochemistry (IHC) panel in 22 (11.3%) for further confirmation, had a positive correlation ($p<0.001$), Table 4. This supports the need of ancillary techniques for special stains and IHC panel study for the specific as well confirmatory diagnosis and signifies the importance of ancillary techniques together with. At our center, we receive biopsy specimens from the different eye hospitals in the region, and may and may be taken as representative sample of the distribution of orbito-ocular lesions from the eastern part of our country.

The limitations of our study include the wide variation and small numbers in some of the spectrum of orbito-ocular lesions. With lack of published data from this region, it was difficult to provide comparison.

Conclusions

Our findings reveal positive correlation between the clinical and histopathological diagnosis of orbito-ocular lesions. Inflammatory lesions accounted for half of the non-neoplastic lesion, squamous cell carcinoma were 2/3rd of malignant neoplasm. Granulomatous inflammatory lesions were commonest within the corneo-conjuctiva and eyelid lesions.

Acknowledgements

We are thankful to Dr. Tara Kafle for her support in statistical analysis.

Conflict of interests

None

Funding

None

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