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Presentation of Ocular Surface Squamous Neoplasia, Its Demographic, Histopathological Analysis

Kumar Jitendra^{*1}, Sahay Renu², Gujarathi Atul M¹, Shams Misba¹

1. Dept. of Ophthalmology, Maharani Laxmi Bai Medical College, Jhansi, Uttar Pradesh, India

2. Dept. of Pathology, Maharani Laxmi Bai Medical College, Jhansi, Uttar Pradesh, India

*Corresponding Author: Kumar Jitendra

Abstract

Studying of the presentation of Ocular surface squamous neoplasia with analysis of its demographic and histopathological characteristics was the aim of this study. This study is a case series of 38 suspected cases of OSSN presenting at our institute over a period of 24 months. Detailed history and all clinical and demographic parameters were noted. Suspected lesions underwent excision biopsy and histopathological investigation. All the data were analyzed and presented in the form of statistical percentage. For the study, five discrete variables namely Gender, Laterality, Location, Keratinisation, size and their association with invasive disease was calculated using Chi square test and fisher's test. Total 38 cases were included in study. Patients were usually male (71.8%), elderly (63.15% with age > 60 years), 32 cases were diagnosed as OSSN. Disease was predominant in rural areas (76.31%) and in occupations with sun exposure i.e. Agriculture (36.8%) & Labourers (39.4%). Most commonly presented as visible mass (63.15%) nodular type (60.52%). Invasive disease was present in 18 cases (56.25%), large size of tumour was associated with invasive disease (two tailed p Value: 0.01 by fisher's exact test). Histopathological evidence of solar damage was present in most of the cases. It was concluded that OSSN is common in Bundelkhand region. OSSN occurs in sun damaged ocular surface, usually presents as a limbal nodule in rural, elderly men. Larger tumour size was associated with invasive lesions. Large tumours should be treated with great surgical care and should be closely followed up.

Key words: Ocular surface squamous neoplasia, limbal nodule, excision biopsy, keratinisation, invasive disease.

Introduction

Worldwide, conjunctival squamous cell carcinoma (SCC) is an uncommon disease, the incidence of which varies geographically from 0.02 to 3.5 per 100 000. The term ocular surface squamous neoplasia (OSSN) was introduced to encompass the spectrum of conjunctival and corneal intraepithelial neoplasia (CIN) and SCC^[1]. There are several issues, we wished to investigate in our set up, particularly clinical, demographic and histopathological characteristics. The average incidence of OSSN of conjunctiva and cornea was estimated to be 1.9/100,000 population per year in the Brisbane metropolitan area of Australia by Lee in 1992^[1] and 0.13/100,000 in tribal groups in Uganda by Templeton in a study.^[2] Sun and co-workers reported an average incidence of 0.3 million per year in United States in 1997.^[3] In a recent study published in 2012 an incidence of 37.3 per 10⁶ was reported for all eye cancers and 8.4 per 10⁶ for SCC^[4]. Highest risk of OSSN is seen in males, Caucasians and residents of lower latitudes. As this is not an uncommon disease in Bundelkhand region of India, we have collected a case series of 32 patients presenting with the disease to our institute over the period of 2 years. Impression cytology is a useful method for confirming the diagnosis of OSSN, particularly in recurrent cases being considered for topical chemotherapy, such as mitomycin C (MMC). Although we have found a high degree of reliability in detecting dysplasia, it is not clear whether SCC can be readily differentiated from in situ disease on cytological grounds alone. We have also tried to identify specific markers of invasive disease.

Material and methods

It was a prospective consecutive case series of suspected OSSN cases presenting at our institute. Study was carried out with patients, who were suspected case of OSSN during the period of 24 months from August 2012 to August 2014. Patients, who could not give history properly nor had responsible attendant were excluded from the study. The procedures followed were in accordance with the ethical standards committee on human experimentation (institutional or regional) and with the Helsinki Declaration of 1975, as revised in 2000. A thorough clinical examination was done including slit-lamp examination, gonioscopy and fundus examination. A complete assessment of pre-identified clinical variables like history, laterality and position of lesion, lesion size, corneal neo-vascularisation, pigmentation, and keratinisation was done and detail history was obtained from patients. Demographic parameters like residential address, occupation, monthly family income and socio economic status were noted. Suspected lesions underwent excision biopsy followed by histopathological investigation. Sections of all cases and tumour biopsies were assessed for the following features: Differentiation, Keratinisation, Associated CIN or CIS, Completeness of excision, associated solar damage in stroma, Shape of lesion, Extent of local invasion, Intraocular or orbital invasion. Results were expressed as median (range) for continuous variables and as actual numbers or percentage for categorical variables. Association between five discrete variables namely Gender, Laterality, Location, Keratinisation, size and invasive disease was calculated using Chi square test and fishers test.

Results

a. Demography: Total 38 cases were included in study. 68.42% (Total 26) were male patients. Age of the patients was ranging from 45 years to 88 years with mean age of 64.11 years, median age of 65 years^[Figure-1]. 76.31% patients (total 29) were from rural areas and were from lower socio-economic group as 68.74% (total 24) patients had monthly family income <Rs10000 and were mostly involved in unskilled works like agriculture (36.84%), or labourer (39.47%).^[Figure-2]

Clinical characteristics: Clinical appearance of the lesion was also documented. A mass in inter-palpebral aperture^[Figure-3] was the most frequent presenting symptom and was present in 63.15% (Total 24) patients.^[Figure-4] Duration of the disease at the time of presentation was ranging from less than 1 week up to 2 years. Morphologically most common clinical subtype was Nodular Growth in 23 patients (60.52%).

Histopathological Features: Out of 38 cases included in study for suspicion of OSSN, 32 were diagnosed as OSSN on histopathology. Epithelial dysplastic changes were present in 14 cases^[fig-5] case 18 cases showed a thickened keratotic plaque with invasion that varied from micro invasion to lobules. Out of 18 cases 12 showed predominantly endophytic growth^[fig.6] and 6 were pappilomatous/exophytic. Three cases were well differentiated, 14 were moderately and one poorly differentiated^[Fig 7]. Although most of the lesions were keratinising, the degree varied from very minor focal in one to marked. Five discrete variables namely Gender, Laterality, Location, Keratinisation, size of the tumour, were suspected to be associated with invasive disease. Tumour size (>5mm in diameter) was significantly associated with invasive disease (p Value: 0.011). Odds of having invasive disease with tumour size more than 5mm in any dimension were almost 9 times (OR : 8.75). While Gender, Laterality, Location, Keratinisation were insignificantly related with invasive disease.^[Figure-8] Solar damage, represented by basophilic, elastotic or spheroidal degeneration in stromal collagen in conjunctiva, was present in most of cases.^[figure-9]

Discussion

Our series confirms that SCC of the conjunctiva is not an uncommon lesion in Bundelkhand Region where 32 cases were reported in the period of 24 months. Like other series, we found that the tumour occurred predominantly in elderly males (71.8%), with most lesions involving the limbus (81%).

Reports from Brisbane, Queensland, which has a subtropical climate, reveal that SCC occurs in a younger population with only 50% of patients older than 60 years, compared with 63% of our series. Histological evidence of solar injury, which is recognised as a major risk factor for conjunctival SCC, was found in all of our cases, compared with only 50% found by Tabrizi and colleagues in a similar Australian population^[5]. 72% of our patients presented with a mass or growth, similar to the findings of Erie et al (77%)^[6], but in contrast with 28% in a large series from Queensland. Duration of symptoms ranged from days to years with a median of 3–4 months. Only 18 (56.25%) of our cases showed minimal microscopic invasion of the stroma compared with 80% of the Mayo Clinic series.

Kao AA, Galor A, Karp CL described the clinical and histological characteristics of ocular surface squamous neoplasia (OSSN) lesions where they found 33% of submitted specimens were characterized as mild, moderate, or severe dysplasia; 52% were classified as carcinoma in situ; and 11% were graded as squamous with higher-grade OSSN lesions found in males.^[7] While our study shows that most of the cases (43.75% cases, total no:14) were moderately differentiated SCC and 37.5% cases were moderate to severe dysplasia. However, relation of gender of patient to the severity of the disease could not be proved ('p' Value: 0.728)

Ng J, Coroneo MT, Wakefield D, Di Girolamo N. performed immune histochemical analysis to determine their responsiveness to ultraviolet (UV)-B radiation compared with normal conjunctival epithelial cells (NCECs)^[8]. In another study Jacyk WK. studied fifteen black South African patients aged from 10 months to 21 years, with xeroderma pigmentosum.^[9] both studies concluded that incidence of Ocular surface squamous neoplasia is higher in patients where there is increased exposure to the UV rays. In our study we can say that most of the patients are involved in outdoor activities (Agriculture 37.5% and labourers 40%) where there is increased exposure to the sunlight thus we can conclude that exposure to the UV radiation can be a major risk factor for development of the disease.

Perhaps the most interesting finding from our data was that lesion size was associated with SCC. The regression analysis revealed that size was also independently associated with SCC. The tumour size greater than 5 mm was found to be significant for SCC. Study conducted by Makupa II, Swai B, Makupa WU have also found that larger size was associated with malignancy.^[10] For lesions equal to or smaller than 20.5 mm² other factors such as HIV status became relevant.

References

1. Lee GA, Hirst LW. Ocular surface squamous neoplasia. *Survey of Ophthalmology* 1995; 39:429–50
2. Templeton AC. Tumours of the eye and adnexa in Africans in Uganda. *Cancer*.1967; 20: 1689–98.
3. Sun EC, Fears TR, Goedert JJ. Epidemiology of squamous cell conjunctival cancer. *Cancer Epidemiology Biomarkers Prevention*.1997; 6: 73–77
4. Kao AA, Galor A, Karp CL, Abdelaziz A, Feuer WJ, Dubovy SR. et al Clinicopathologic correlation of ocular surface squamous neoplasms at Bascom Palmer Eye Institute: 2001–2010. *Ophthalmology* 2012; 119: 1773–6.
5. Tabrizi SN, McCurrach FE, Drewe RH, Borg AJ, Garland SM, Taylor HR. et al (1997), Human papillomavirus in corneal and conjunctival carcinoma. *Australian and New Zealand Journal of Ophthalmology*, 25: 211–215.
6. Erie JC, Campbell RJ, Leisgang J. Conjunctival and corneal intraepithelial and invasive neoplasia.

Ophthalmology 1986; 93: 176–83.

7. Kao AA, Galor A, Karp CL, Abdelaziz A, Feuer WJ, Dubovy SR et al Clinicopathologic correlation of ocular surface squamous neoplasms at Bascom Palmer Eye Institute: 2001–2010. Ophthalmology.2012; 119: 1773–1776

8. Ng J, Coroneo MT, Wakefield D, Di Girolamo N. Ultraviolet radiation and the role of matrix metalloproteinases in the pathogenesis of ocular surface squamous neoplasia. Investigative Ophthalmology and Visual Science. 2008; 49: 5295-5306.

9. Jacyk WK. Xeroderma pigmentosum in black South Africans. International Journal of Dermatology. 1999; 38: 511–514.

10. Makupa II, Swai B, Makupa WU. Clinical factors associated with malignancy and HIV status in patients with ocular surface squamous neoplasia at Kilimanjaro Christian Medical Centre, Tanzania. British Journal of Ophthalmology.2012; 96: 482–4.

TABLES AND FIGURES

Table: 1(Original). Table showing distribution of patients according to age groups.

Age Group/ Sex	<50 years	50-60 years	61-70 years	71-80 years	>80 years	Total No.	Percentage
Male	2	9	12	2	1	26	68.42%%
Female	1	2	4	4	1	12	31.57%%
Total	3	11	16	6	2	38	
Percentage	7.89%	28.29%	42.10%	15.7%	5.26%		

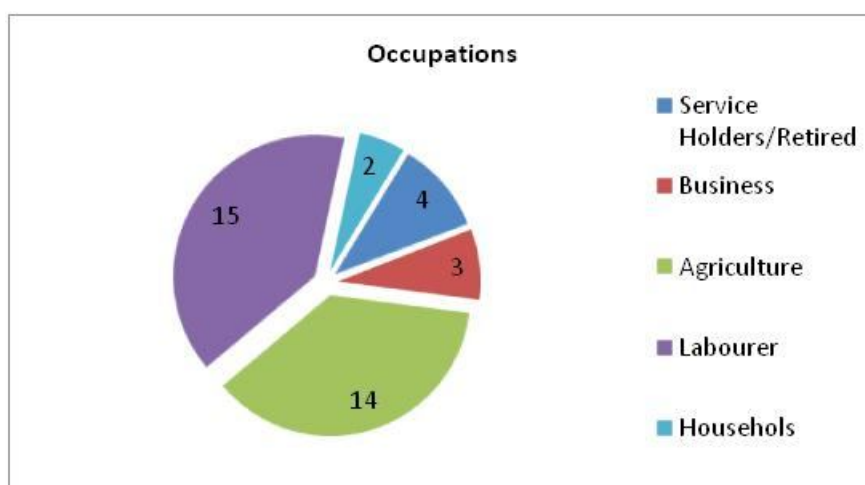


Fig:1(Original). Graphical representation of occupations of patients



Figure-2 (Original): Photograph showing presentation of OSSN as a nodular mass in the palpebral aperture involving limbus.

Sr no	Clinical Symptoms	No of patients
1	Mass	24
2	Irritation and redness	10
3	Dimunition of vision	3
4	Recurrent conjunctivitis	1

Table:2 (Original). Clinical presentation of OSSN

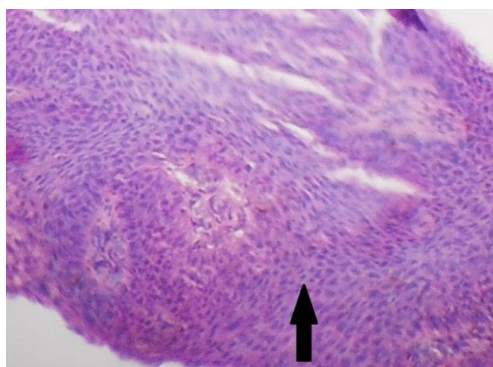


Figure 5 (Original): Histopathological section showing large hyperchromatic nuclei suggestive of dysplastic changes

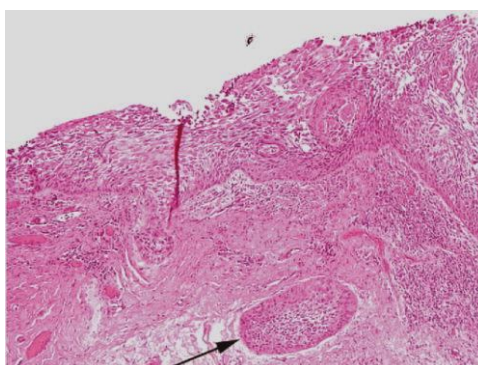


Figure 6 (Original): Endophytic carcinoma with lobules of keratinisation

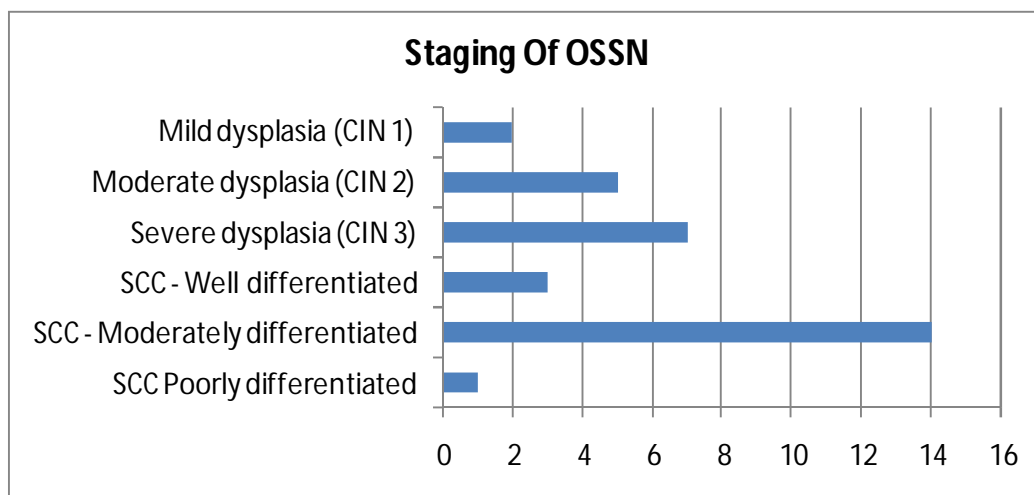


Fig:7 (Original). Graphical representation of staging of disease

Table:3 (Original). Table showing strength of association between independent variables and invasive OSSN

Sr No	Varriables	Odds Ratio	X ^{2*}	dof [†]	'p' Value [‡]
1	Gender	1.83	0.12	1	0.728
2	Location (Nasal/temporal)	0.76	0.12	1	0.722
3	Laterality (Right/Left)	0.27	1.65	1	0.197
4	Keratinization	0.25	2.169	1	0.14
5	Tumour size	8.75	5.878	1	0.011