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INCIDENCE OF VARIOUS SKIN TUMOURS /TUMOUR- LIKE LESIONS IN RURAL NORTH COASTAL ANDHRA PRADESH -AN INSTITUTIONAL STUDY FOR A PERIOD OF 3 YEARS IN A TERTIARY CARE HOSPITAL.

Pathology

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ABSTRACT

Background: Skin lesions consisting Benign and Malignant tumours & tumor like lesions are most common health problems in India. Tumours and tumor like lesions of Skin have overlapping clinical presentation & pose diagnostic difficulties on clinical ground alone. As such they have to undergo Histopathological examination to rule out malignancy for proper management. Especially in case of tumorlike lesions, to distinguish them from Malignancies is vital in clinical practice for successful treatment.

Objective: To analyse retrospectively lesions/tumors of the skin with respect to age , sex, location and Histopathological findings in a tertiary referral hospital located in rural coastal Andhra Pradesh,India.

Materials & Methods: The present study consisted of analysis of skin biopsies and excision specimens of 80 numbers over a period of 3 years i.e from January 2015 –December 2017. The gross and histopathological details were noted..The final diagnosis of a case was based on clinical history, relevant investigations ,gross findings and microscope examination. The findings were compared with those reported by other authors.

Results: Out of 3625 surgical specimens /biopsies received in Pathology department , Govt Medical College ,Srikakulam over a 3 year period,the incidence of skin lesions /tumors found to be 80 (2.19%). The skin lesions consisted of 13(16.25%) Benign tumors, 9(11.25%) Malignant tumors and 58(72.5%) Tumor like skin lesions. More Benign tumors were observed in females,almost in all age groups and maximum malignant tumors were noticed in males ,mostly confined to 41-60 yrs age group. Head & Neck region bore maximum number (38.75%) skin tumors and Tumor like leisons compared to other sites of body.Occurrence of tumor like skin leisons were concentrated in males with M:F ratio of 2.6:1.Pilomatricoma was the commonest Benign tumor and Malignant Melanoma has emerged as the dominant malignant tumor followed by Meibomian Carcinoma.Epidermal cyst was the commonest tumorlike lesion(69%) followed by Dermoid cyst(10.34%) and Proliferating Trichilemmal cyst(5.2%).

Conclusion: Benign Skin lesions more common than malignant lesions.Malignant Melanoma (MM) is the most common malignant skin tumor followed by Meibomian Carcinoma(MC) but not Squamous Cell Carcinoma (SCC) which was reportedly the most common malignant skin tumor in India.Histopathological study is very important step in the diagnosis of skin lesions/tumors,especially tumorlike skin lesions ,for their correct clinical management.

KEYWORDS

Histopathology, Skin tumors, Meibomian carcinoma,Tumor like lesions.

INTRODUCTION:

Dermatological disorders /tumors/leisons are more common in all countries but the spectrum varies greatly. A wide range of neoplastic and non-neoplastic diseases can develop within skin because of its complexity.(McGrath&Vitto and SharmaA etal(39,57) The variation in trends & incidence of various skin leisons may be due to difference in skin types,geographical distribution,occupational exposure,sun exposure,skin protection measures etc. The skin is also a site of secondary deposits of internal Malignancies (MVC deSilva(40).

Though in India the incidence of skin tumors/Malignancies is low ,may be around 1-2 % of all all cancers, (possibly due to high melanin content in Indian skin)worldwide the incidence has shown increasing trend,partly attributed to increasing sun exposure necessitating vigorous surveillance, Koh wang[30]. Various cancer registers in India reported incidence of skin cancer varying from 0.5 to2 per 100000 population, Deo SV et al (16).Due to diversity of skin Tumors ,there can be confusion regarding nomenclature of these Tumours ,Rossi et al (51).

In addition to Skin tumors, tumor-like Skin leisons are very common and these skin leisons present like tumors,causing anxiety to the patient and family.Hence the ability to distinguish these leisons from tumors is vital for clinicians for proper management of these lesions,Bari v et al (7).Much work on skin leisons has been available in western literature compared to few studies in India in the field of Dermatopathology,Narang&Jain(54).Though the frequency of skin tumors and tumor like skin leisons in India was considerable,not much documentation is available on varieties and spread of skin tumors,in India.More than hundred different types of tumors are known to be clinically apparent on the skin due to the complexity of its structure with multiple cell types.Shekhani et al(60).The knowledge of Histopathological pattern can help in the prognosis and planning of effective management of various skin tumours /lesions and many a time Histopathology alone remain a diagnostic tool to surgeons,Reddy MK et al (49).

Hence this retrospective study was undertaken to characterise the spectrum of skin tumors & tumor-like skin lesions prevailing in North-coastal Andhra Pradesh, encompassing rural and backward districts, based on Histopathological features.

MATERIALS AND METHODS:

The present retrospective study consisted of an analysis of 80 tumors and tumor like leisons of Skin received in the Histopathology section of department of Pathology ,Govt. Medical College,Srikak ulam (erstwhile RIMS,Srikakulam) over a period of 3 years,i.e. from January 2015to December 2017.The material comprised of Skin biopsies and excision specimens . The formalin fixed paraffin embedded skin biopsy tissue sections stained with Hematoxylin and Eosin slides were retrieved and studied and their pattern were analysed to distinguish each entity.The clinical information regarding age, sex, location of the tumor and any Special clinical features were obtained from specimen requisition form or from patient's case records. However ,in our laboratory set up, the facility for histochemical staining for enzymes was not available and hence were not performed.

INCLUSION CRITERIA:

1.The study included all the patients presented with tumors(benign and malignant) and tumor like lesions arising from skin and adnexa diagnosed on Histopathological examination .2.we have followed the WHO classification-2006 while tabulating the various types of skin and adnexal tumors .

Exclusion criteria:

1. All other tumors and cysts of genitalia,tumors of the mucous membranes were excluded.
2. Skin secondaries were excluded.

RESULTS:

During this study period ,a total of 3625 surgical Pathology specimens /biopsies were received and out of which 80 are diagnosed as skin

disorders/leisons(2.20%).Among these 80 ,22(27.50%)were diagnosed as Tumors and 58(72.5%) were diagnosed as tumor-like skin leisons.

Out of 22 tumors ,only 9 were accounted as malignant leisons(11.25%) and the rest of 13 (16.25%) were accounted as benign skin tumors,indicating that benign tumors were more prevalent than malignant leisons in northcoastal AndhraPradesh. .It was also noticed that malignant lesions are more common in males compared to females and benign tumors observed more in females. (**Table 1**.)

Table-1. Sex-wise distribution of Tumors&Tumor-like skin lesions

Sl.No.	Type of SKIN Leisons	Male No.(%)	Female No.(%)	TOTAL No.(%)
1	BENIGN tumors	5(9.6)	8(28.6)	13(16.25)
2	MALIGNANT tumors	5(9.6)	4(14.3)	9(11.25)
3	TUMOR-like lesions	42(80.8)	16(57.1)	58(72.5)
	TOTAL	52(100.0)	28(100.0)	80(100.0)
	Male:Female Ratio 1.86 : 1			

It was also observed that males were prone for (63.75%)skin tumors /Lesions in comparison to females(36.25%) ,with a ratio of 1.86:1 between males& females.

Further, more (50.00%)skin lesions were noted in 41-60 years age band group (11/22)followed by (22.7%) in >60 years age band(5/22); where as 21-40 years age band showed 18.2% incidence(4/22)and less (9.1%)number of lesions (2/22)in 0-20 years age band group.Thus it was noted that the middle age group i.e 41-60 years was more vulnerable to skin lesions compared to others age groups.**(Table 2)**

Table 2 . Age&Sex-wise distribution of Benign and Malignant Tumors

	BENIGN		MALIGNANT		TOTAL
AGE BAND	Male	Female	Male	Female	
0-20 yrs	0	2	0	0	2
21-40 yrs	2	2	0	0	4
41-60 yrs	2	1	4	4	11
> 60 yrs	1	3	1	0	5
Total	**5**	**8**	**5**	**4**	**22**

The incidence of Tumor like leisons was more common in males

(72.4%)compared to females (27.6%) and the age group of 21-30 years found to be more vulnerable (31.0%) compared to other age groups; with least incidence in patients of 71-80 years group. Further ,the age group of 21-30 was equally affected both in males & females(31%).

Table-3. SITE -WISE DISTRIBUTION OF TUMOR AND TUMOR-LIKE LESIONS (n=80)

		NUMBER OF CASES(%)			
SL NO	SITE	BENIGN	MALIGNANT	TUMOR LIKE	TOTAL
		TUMORS	TUMORS	LEISONS	
1	**Head&neck**				
	Scalp	1(7.60)	0	4(6.9)	5(6.2)
	Face	4(30.8)	4(44.4)	9(15.5)	17(21.2)
	Neck	0	0	9(15.5)	9(11.3)
2	**Trunk**	1(7.7)	0	8(13.8)	9(11.3)
3	**Upper limb**	1(7.7)	0	4(6.9)	5(6.2)
4	**Lower limb**	2(15.4)	3(33.3)	6(10.4)	11(13.8)
5	**Not specified**	4(30.8)	2(22.2)	18(31.0)	24(30.0)
	TOTAL	**13(100)**	**9(100)**	**58(100)**	**80(100)**

while studying the distribution of various skin tumors / lesions over the body of patients, it was found that majority (38.75%) of them were spread over Head& Neck region, followed by Lower limb(13.8%),Trunk(11.3%) and upper limb(6.2%). But this may not reflect near correct picture,as in 6 cases of tumor & 18 cases of tumor like lesions the site was not properly mentioned, in patient history sheets. (**Table 3**)

Grouping the Skin lesions under study based on histopathological examination ,it was observed that 57.5% were Cutaneous cysts, consisting of 46 Epidermal & Dermoid cysts ;12 (15%)were Benign tumors;9 (11.25%) were Malignant tumors; 12 (15%) were Others category and only one (1.25%) was under Congenital category, identified as congenital melanocytic Nevus**.**

According to WHO -2006 classification, (Le Boti P et al)[34] the skin tumors under study ,based on origin ,were broadly classified under 4 types, namely Epidermal; Melanocytic; Adnexal and Miscellaneous/ Others.(**Table-4**)

Table: 4. Distribution of tumours According to WHO 2006

Sl.No	Type of Tumor	Benign No(%)	Malignant N0(%)	Total N0(%)
1	Epidermal	2(15.4)	2 (22.2)	4(18.20)
2	Melanocytic	1(7.7)	4(44.4)	5(22.7)
3	Adnexal	8(61.5)	3(33.3)	11(54.5)
4	Miscellaneous/others	2(15.4)	0	2(9.1)
	Total	13(100)	9 (100)	22(100)

Adnexal tumors(11/22) ,both benign and malignant ,were common tumors of Skin (54.5%)while 2 tumors (9.1%)were classified under Miscellaneous type ,one each of Dermoid tumor & Giant cell tumor of tendon sheath.

In our study, Malignant Melanoma was the commonest malignant tumor ,(4/9) with an incidence of 44.4% followed by Meibomian Carcinoma (3/ 9) at 33.3% and Squamous cell Carcinoma (2/9) at 22.2%.Out of 13 Benign tumors studied, Pilomatricoma (30.8%) was reported in 4 cases; Squamous papilloma and Eccrine acrospiroma were reported in 2 cases each.(**Table 5.**)

Table 5.. Distribution of Tumors and Tumor-like skin leisons based on Histological Diagnosis (n=80)

Sl. No.	BENIGN TUMORS No&%	MALIGNANT TUMORS No&%	TUMOR-LIKE LESIONS No&%
1	squamous papilloma 2(2.5)	Squamous cell carcinoma 2(2.5)	Epidermal cyst 40(50.0)
2	Eccrine acrospiroma 2(2.5)	Meibomian carcinoma 3(3.750	Dermoid cyst 6(7.5)
3	Pilomatricoma 4(5)	Malignant melanoma 4(5.0)	Trichilemmal cyst 1(2.5)
4	Trichofolliculoma 1(2.5)		Proliferating Trichilemmal cyst 3(3.75)
5	Dermoid tumor 1(2.5)		Xanthoma 1(2.5)
6	Giant cell tumor of tendon sheath 1(2.5)		Hemangioma 1(2.5)
7	Keratoacanthoma 1(2.5)		Idiopathic calcinosis 1(2.5)
8	Melanocytic nevus 1(2.5)		Hemartoma 1(2.5)
			Tumoral calcinosis 1(2.5)
			Nodular tenosynovitis (2.5)
			Fibroepithelial polyp 1(2.5)
			Marjolin ulcer with dysplasia 1(2.5)
TOTAL	**13**	**9**	**58**

During this study, out of total 80 Skin lesions analysed,58(72.5%) were Tumor-like Skin lesions .Among them, Epidermal cyst was the commonest tumorlike lesion (68.9%) followed by Dermoid cyst (10.3%) ,Proliferating Trichemmal cyst in 3 cases (5.1%) and while other tumor like skin leisons such as Xanthoma, Tumoral calcinosis etc were encountered in single cases.

Maximum number of cases occurred in males(72.4%) showing male preponderance(M:F ratio 2.6:1). Male Patients in 3rd, 2nd & ,5th decades of age suffered more ; while 3 rd decade proved to be equally vulnerable in both males & females, accounting for maximum number of cases.

Findings on some important Individual Benign and Malignant skin tumors & Tumor like lesions in our study(**Table 6.**)

Table 6. Inicidence of Individual skin tumors/lesions observed : Age band-wise

Sl.NO.	Type of tumor/leison	0-20 yrs	21-40yrs	41-60yrs	> 60yrs	TOTAL
	Epidermis					
1	Epidermoid cysts	10	19	11	0	40
2	Dermoid cysts	4	1	1	0	6
3	Squamous papilloma	0	1	1	0	2
4	Fibroepithelial polyp	0	1	0	0	1
5	Squamous cell carcinoma	0	0	2	0	2
6	Marjolina ulcer with dysplasia	0	0	1	0	1
	Skin adnexa					
	Eccrine sweat gland					
7	Eccrine acrospiroma	1	0	0	1	2
	Apocrine/sebaceous					
8	Meibomian carcinoma	0	0	3	0	3
	Hair follicle					
9	Trichilemmal cyst	0	1	0	0	1
10	Proliferating trichilemmal cyst	0	0	0	3	3
11	Pilomatricoma	1	0	1	2	4
12	Keratoacanthoma	0	0	1	0	1
13	Trichofolliculoma	0	0	0	1	1
	Melanocyte					
14	Congenital melanocytic nevus	0	1	0	0	1
15	Malignant melanoma	0	0	2	2	4
	Dermis					
16	Xanthoma	0	0	0	1	1
17	Hemangioma	1	0	0	0	1
	Miscellaneous					
18	Idiopathic calcinosis	0	0	0	1	1
19	Dermoid tumor	0	1	0	0	1
20	Hemartoma	0	0	0	0	1
21	Giant cell tumor of tendon sheath	0	1	0	0	1
22	Tumoral calcinosis	0	0	0	1	1
23	Nodular tenosynovitis	0	0	1	0	1
	TOTAL	17	27	24	12	80

Lesions from epidermis:
In our study the majority of skin lesions (65%)were of epidermal origin (52/80) and consists of 2.5% Malignant tumors,2.5% of Benign tumors and the rest of them (60%) were Tumor like lesions.
Among the Benign tumors ,Squamous papilloma was accounted in 2 cases(2.5%) .

Squamous cell Carcinoma was reported in 2 cases(2.5%) under malignant tumors in males of 50&48 years age over Pinna and Thigh regions respectively.Clinically both cases were diagnosed as ulcero proliferative growths and histologically one was well differentiated SCC & the other was moderately differentiated SCC. Out of the remaining 48 Tumor like leisons,40(50%) were diagnosed as Epidermal cysts; 6 were Dermoid cysts and one case of Fibroepithelial polyp & one case of Marjolin ulcer were reported.

Epidermal cyst:The peak incidence (47.5%)of epidermal cysts was noted in 3rd & 4 th decades of patients life with ,85% incidence in males & 15% in females ,showing male preponderance.Out of 40 cysts,15 were infected showing mixed inflammatory cells . Dermoid cyst: The age group of 0-20 years showed higher incidence with equal distribution among both males & females .One Dermoid cyst was found to be infected among 6 cysts.

Fibroepithelial polyp: Only one case was reported in the age group of 21-40 years.

Lesions from adnexal structures:
Most common tumors (66.6%) in our study were tumors of hair follicle origin ,10 out of 15 adnexal tumors; followed by sebaceous differentiation (20%) 3 out of 15 and 2 out of 15 were sweat gland differentiation (13.4%).

Out of 15 Adnexal tumors, 3 were of malignant & 7 were of benign nature. Out of a total of 15 (18.75%) adnexal tumors of skin ,12 (80%) were benign and 3 (20%) were malignant tumors. All the 3 malignant tumors were diagnosed as Meibomiam carcinoma and in Benign tumors,2 cases were of Eccrine acrospiroma, 4 cases of Pilomatricoma one each of Keratoacanthoma& Trichofolliculoma were identified.

Malignant tumors:
Meibomian Carcinoma — 3 cases were reported in females of 60 yers age group.In 2 cases,right upper eye lid and in 1 case left lower eyelid was affected.All 3 cases were presented as painless masses on eyelids ,histologically characterised by irregular lobules of undifferentiated atypical cellswith sebaceous areas of necrosis and infiltrative patterns of growth.

FIG5: Microphotograph of mebomian carcinoma showing tumor cells with foamy vacuolated cytoplasm (H&E Stain40x)

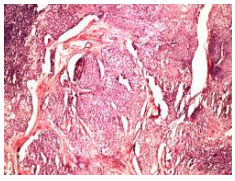
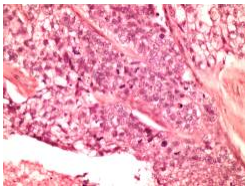


Fig 6:H P view of MC



Benign tumors:
Pilomatricoma—- Out of 4 tumors reported,3 occurred in female with one case in a male patient in their 5th decade of life. While 2 tumors were located on thigh & upper eyelid respectively,in 2 cases site of occurrence wasn't properly noted.Histologically all 4 tumors showed well circumscribed tumor characterised by islands of epithelial cells composed of ghost cells,shadow cells in the centre surrounded by basaltic cells(abrupt keratinisation).

Eccrine acrospiroma:—This tumor was observed in 2 cases and in 1 case in a female child of 3 years, the lesions was found on plantor region ,measuring 3x2x1 cm as nodular grey white mass cut section showing capsulated solid and grey brown ,multiple cystic spaces. In another case a male of 65 yrs age,leison measured 6x6x2 cms mass over back region ,with cut section showing grey white solid areas & cystic spaces ;Histologically showing well circumscribed lesion composed of tumor cells arranged in solid sheets& nodules with heterogeneous cellular features with clear cells and polygonal cells.

Fig 7: Microphotograph of Eccrine acrospiroma showing two types of epithelial cells with central large pale nuclei and peripheral small dark nuclei with in vascular stroma.(H&E Stain 40x)

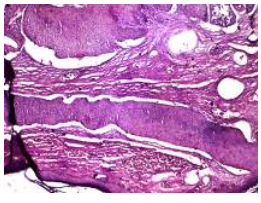
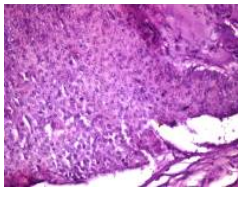


Fig 8: HP View Eccrine acrospiroma



Keratoacanthoma— One case with occurrence in a male of 60 yrs age on left pre-auricular region ,showing dome shaped leison with central keratin filled crater with overhanging edges.The base of the leison was well demarcated from the dermis.

Trichofolliculoma—One case was reported in a female of 72 yrs age on scalp,grossly as grey white soft tissue bits.Histologically showing,cystically dilated follicles containing keratin and few fragments of hair shafts,several immature secondary follicles radiate with normal hair follicles.

Tumor - like lesions:

Proliferating Trichilemmal cyst—3 cases were reported,one in a male of 65 yrs age & 2 cases in females of 70-72 yrs age.All 3 cases with common site as scalp and didn't exhibit any cellular atypia and necrosis.

Trichilemmal cyst—one case in a female of 30 years age on scalp was reported showing cystic lesion lined by stratified squamous epithelium with focal areas of abrupt keratinisation.

Fig 9: Gross Photograph of Trichilemmal cyst

Fig 10 : Microphotograph of Trichilemmal cyst (H&EStain40x)

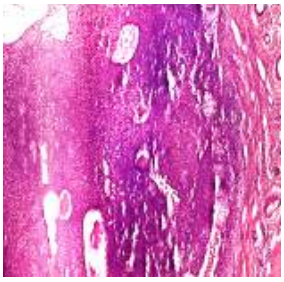
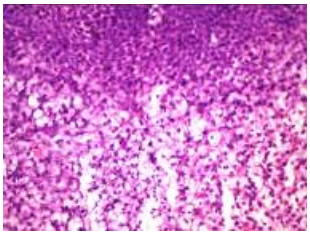


Fig 11:HP view



Lesions from Melanocytes:

Malignant melanoma—In the present study malignant melanoma was reported in 4 cases in males of above 60 yrs age and clinically presented as ulceroproliferative growths over foot.

Histologically the tumor cells are composed of nests, diffuse sheets and of focal trabecular pattern. The individual cells are round to oval and spindle shaped cells and some of them with prominent nucleoli with areas of pigmentation.

Fig1: Gross photograph of malignant melanoma Malignant melan oma-pigmented nodular lesion with irregular borders

Fig 2: Cut section of Maignant Melanoma

Fig 3: Microphotograph of malignant melanoma showing large cells with high pleomorphism ,prominent nucleoli, abundant melanin pigment diffusely infiltrating into deep dermis(H&E40X)

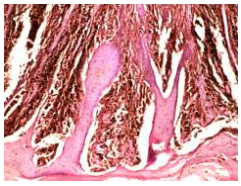
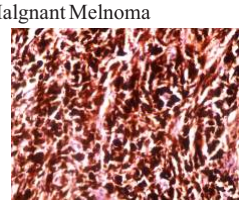


Fig 4:HP View of Malgnant Melnoma



Melanocytic Nevus—one case of congenital melanocytic nevus in a male patient of 21 years ,on nose ,presented as slow growing mass was reported. Tissue bit coverd with skin measuring 1.5x2 cm, hair present. Histopathology showed thinned out epidermis with upper dermis showing nests of nevus cells with nucleomegaly, irregular nuclear borders. The mid &deeper dermis showed sheets of nevus cells with round to oval nucleus with focal hyperchromasia and variable amount of pigment.

Lesions from Dermis:

There were no benign& malignant tumors reported under this category in our study. Only 2 cases of tumor like lesions encountered ;one case of xanthoma in male of 75 years, ad measuring 2x1.5x 1 cm well circumscribed nodule of yellowish orange granules and the other case was hemangioma in female of 20 yrs age, in left temple region.

Lesions under miscellaneous group:

There were no malignant tumors reported under this category in our study ,but 2 benign tumors & 4 tumor like lesions were reported . Benign tumors includes one case of dermoid tumor in a female of 30yrs age on right ear and Giant cell tumor of tendon sheath in a male of 21 years on right little finger were encountered.Histologically GCT of tendon sheath showed well circumscribed leison with solid sheets of round to spindle shaped cells admixed with plenty of foreign body giant cells.

Under tumor like lesions, one case of Idiopathic calcinosis in a female of 65 years age on right forearm; one case of Hemartoms in a Male of 21 yrs age; one case of Tumoral calcinosis in a female of 65 yrs age on left hip region and one case of Nodular tenosynovitis in a male of 50 years age were found.

DISCUSSION :

Skin lesions are more common throughout the Globe including India, both in Rural & Urban areas. Various lesions afflicting the skin range from Non-specific dermatoses & inflammatory diseases to Tumors of various components of skin. Barring limited literature, there is paucity of data on the spectrum of tumors & tumor-like lesions of Skin and especially incidence of skin cancer in Andhra Pradesh state ,compared to data available in Indian literature pertaining to various regions of India & vast literature on Western countries. Further, skin cancer incidence in India constitute 1-2%of all diagnosed cancers and various cancer registers of India reported cumulative incidence varying from 0.5 to 2.0 per 1,00,000 population (Deo SV et al & National cancer Registry Programme, ICMR ,consolidated report of the population based cancer Registers 1990-96)[16,44].

The above background prompted us to undertake the present 3 year Retrospective analysis of various skin tumors and tumor like leisons , to know the incidence of skin cancer and spectrum of Skin tumors &

tumor like skin leisons prevalent in north coastal area of Andhra Pradesh state.

The incidence of skin Malignancies in different hospital based studies in India ranged from 1.3 to 9.2%.(**Table 7**)

Table 7.INCIDENCE OF SKIN CANCER REPORTED IN VARIOUS STUDIES IN INDIA

Serial no	Authors& year	No of skin cancer cases	Region/ State	% of skin cancer reported
1	Chakravarthy RC etal1968	115	Eastern india	1.87
2	Budhiraja SN etal 1972	102	Puducherry	2.08
3	Kapoor&Goswami 1993	148	Jammu	8.16
4	Kulkarni &Jaiswal1996	260	Maharashtra	9.2
5	Deo S V etal2005	77	North india/Delhi	2.44
6	Binayak Baruah et al 2013	37	Sikkim	2.72
7	Bari V etal2014	61	Maharashtra	1.3
8	Sharma etak2014	632	Jaipur	1.83
9	Gundalli S etal2015	80	Karnataka	2.5
10	Narhire vv etal 2016	36	Maharashtra	2.8
11	Sonal tina lal 2016	84	Punjab	3.18
12	Sugumar C etal 2016	52	Chennai	3.4
13	Samanta etal 2018	52	Puducherry	4.14
14	Khair& Kumar2018	191	Kashmir	3
	PRESENT STUDY	9	North coastal Andhra pradesh	5.66

During the present study ,the incidence of skin cancer is arrived at as 5.66% (Table 8) in our area which is higher to different states in different studies by various authors but lower than Jammu (Kapoor& Goswami) and Maharashtra (Kulakarni & Jaiswal)[25,31]

Table: 8. Incidence of skin cancer in the Present Study

Total no of Biopsies examined including skin biopsies during 3 year period (a)	Total no. Of cancers of all organs including skin cancers(b)	Total No of skin tumors(B&M)(c)	TotalNo of Malignant skin tumors(d)	Percentage of skin cancer(e) e=d/b
3625	**159**	**22**	**9**	**5.66%**

However, various studies across the globe reveal much higher figures of 28.6% in Iran (Noorbala MT),12.70% in Nigeria (Ochicha O et al) and 10% in Yemen (Al- Thobhani AK et al[45,46,3].The wide variation in the incidence of skin cancer may be due to differences in skin types, geographical distribution ,occupational exposure, sun exposure, skin protection measures and differences in disease awareness & surveillance ,Koh D et al [30]

In the present study out of 3625 specimens/biopsies studied ,80 (2.20%) turned out to be Skin tumors/ tumor like leisons with 22 of them(0.60%) were diagnosed as skin tumors constituting 13 Benign & 9 malignant tumors. This is in agreement with the findings of Nandyal et al [43] who reported it as 0.89% ; but higher percentages were reported by Bari V et al (1.3%),Narhire et al (2.8%) ,Samanta et al (4.14%) and Gundalli et al (4.15%)[7,42,53,18].

In this study,the incidence of Benign and Malignant tumors were 59%& 41% respectively in agreement with the findings of Bari V et al [7] ,who reported 51.2%& 48.8% ; but varies with the findings of Harshai et al[20] who reported 68.4%&31.6%; 40.81 & 59.18% reported by Sushma et al[64];72.8%& 27.2% reported by Sheenam Azad et al[59].

Malignant Tumors:

Malignant skin tumors constitutes small proportion of cases but are considered very significant due to severity. In our study, 9 Malignant skin tumors were observed viz 4 (44.4%)Malignant Melano mas (MM) 3 (33.3%)Meibomian Carcinomas(MC) and 2 (22.2%)Squamous cell carcinomas (SCC).Our findings are in variation to almost all Indian studies where SCC has emerged as dominant malignant skin tumor followed by Basal cell carcinoma. But in our study MC has higher incidence and not a single case of BCC was encountered.This may due to less number of biopsies received at our department due to less numbers of referrals received due to backward nature of area coupled with some under reporting may have occurred as some tumors may have been treated without being confirmed by histopathological examination.The incidence of different malignant Tumours of skin in India as reported by various authors are tabulated in Table 9 .

Table 9.Comparative Incidence of different Malignant tumors of skin in India

Type of tumor/Authors	Squamous cell cacinoma	Basal cell carcinoma	Malignant Melanoma	Sebacious carcinoma	Malignant cylindroma	Trichoepithelial carcinoma	Proliferating trichemmaltumor	Dermatofibro sarcoma protuberance	Adnexal carcinoma	Meibomian carcinoma	Others
chakravarthy Rc etal1968	64.30%	16.50%	8.69%	0.00%	0.00%	0.00%	0.00%	5.20%	2.60%	0.00%	0.00%
Budhiraja SNetal 1972	49.2	17.65	29.41	0	0	0	0	2.94	0.98	0	0
Deo SV et al 2005	55.8	18.1	26.1	0	0	0	0	0	0	0	0
Laishram et al 2010	43.6	32.6	3.2	0	0	0	0	0	0	0	0
Adinarayan&krishnamurty 2011	83.9	13.1	0	0	0	0	0	0	0	0	0
Sonam sheikh 2011	55	22.5	6.7	0	0	0	0	0	0	6.7	0
Binayak Baruah etal 2013	64.8	35.4	0	0	0	0	0	0	0	0	0
Bari ,v.etal 2014	45.9	34.4	4.9	0	0	0	4.9	6.6	0	0	0
Sheena Azad etal 2014	43.2	34.1	9.1	0	0	0	0	0	9.1	0	0
Nandyal& Puranik 2014	55	22.5	6.7	0	0	0	0	0	6.7	0	8.9
Mehar R etal 2014	0	2.7	2.7	0	0	0	0	0	0	0	0

Agarwal D etal2015	33.3	58.3	0	0	0	0	0	0	0	0	8.33
Gundalli S etal 2015	46.3	26.3	11.3	0	0	0	5	0	7.5	0	0
Kaur BB etal 2015	30.8	40.4	17.4	0	0	0	0	3.9	0	0	7.69
Chaitra&Bhat 2016	10	10	2.5	0	0	0	0	0	0	0	0
Navnet jain etal 2016	34.3	50	0	0	0	0	0	0	15.6	0	0
Sonal tinaLal etal 2016	36.9	54.7	8.3	0	0	0	0	0	0	0	0
Sunitasingh etal2016	50	19.4	9	5.6	0	0	0	0	0	0	0
Bhuvan etal 2017	56.5	21.7	4.3	0	0	0	0	0	0	0	17.4
Jina etal 2017	67.3	20.8	10	1	0	0	0	0	0	0	0
Jagadev S& Jenna P 2017	56.7	30	13.3	0	0	0	0	0	0	0	0
Sushma etal 2018	53.4	20.7	8.6	3.4	1.7	1.7	0	10.3	0	0	0
Samanta etal 2018	48.3	24.3	20.7	0	0	0	0	0	6.9	0	0
PRESENT STUDY	2.5	0	5	0	0	0	0	0	0	3.8	0

Malignant Melanoma(MM): In our study the % of incidence of MM was 5% and comparable to the values observed by Bari et al[7] at 4.9% and 4.3% by Bhuvan et al[9]. But MM was accounted for from 2.5%(Chaitra & Bhat[14] to 29.4%(Budhiraja et al[12] in various studies in India. Out of 4 cases of MM observed in our study,3(75%) were in males and a lone case of female (25%), thus showing male preponderance & the foot was the most common site and this coincides with the findings of Budhiraja et al[12], Chakravarthy et al[15] ,Reddy DJ& Rao KV[50],Kaur BB et al[27] and Sharma et al[56].

Malignant Melanoma is a relatively uncommon skin cancer in India and its highest prevalence was seen in 6th decade of life in our study as observed by jagadev s& jenna p[23], and Kaur BB etal[27] but Wanebo etal[70] reported female preponderance like jagadev s & jenna p[23], who also observed ' extremity' as common site of occurrence which coincides with our observation .But varies with the findings of Bari etal[7] who reported the commonest site of MM as head & neck region.
Squamous cell carcinoma(SCC) :In dark skin ,SCC has been reported to be the most prevalent Skin malignancy (Godbole Vk et al,Deo sv et al,National cancer Registry &TalvalkarGV)[16,19,44,68]. The incidence ranging from 10.0% to 67.3% was reported by Chaitra & Bhat [12] , Jina etal[24] etc.(Table 9).But in our study SCC emerged as 3rd commonest malignant skin tumor after MM and MC. We have encountered only 2 cases SCC out of 9 skin, malignancies with male preponderance in 5th decade of life and with Pinna and thigh region as site of occurrence. Bari v et al[7] observed incidence of 64%&36% respectively in males and females coinciding with studies of Reddy DJ & Rao Kv[50].But in our study 100% occurrence in males was noticed with nil incidence in females. Our observations of low incidence of SCC with male dominance may be due to less number of cases referred & diagnosed. Common site of occurrence being the extremities was reported by Budhiraja, chakravarthy & Jagadev S and Jenna P.[12,15,23]. In a study made by Kaur BB etal[27], head &neck was reported as the most affected & 82.7% of cases developed in 50yrs age group.

This coincides with our observations of 100% incidence of SCC in males of 50 yrs age group.In contrast to white population, non-exposed sites were more frequently affected by SCC in dark skinned population (Hubell R et al[22]. This coincides with our study where a case of thigh region was affected by SCC in a male.

Basal cell carcinoma (BCC) : Many authors in India reported BCC in their studies ;but not a single tumor was encountered in our study.BCC was considered very common in white population with higher incidence in western countries. But in studies made by Sonal Tina Lal et al[61] & Kaur BB et al[27] in Punjab state in India reported incidence of 54.76% & 40.4% respectively. This was attributed to climatic changes, exposure to UVB radiation, being agriculture based state and high level of arsenic in drinking water.

Meibomian Carcinoma (MC): we have observed 3 cases of MC out of 9 total skin malignancies; all in females in their 6th decade of life. MC was considered to be a relatively rare tumor ,about 1% of all malignant tumors of eyelid and few reported this tumor in Indian literature. But Shukla et al[61] observed 16% incidence in Raipur hospital in the age group of over 40 yrs with upper eyelid predilection. Likewise Kutty MK[32] ,Hussain& Gogoi[21],Maurya RP et al[36] ,Bhanudevi et al[5] and Bhadani PP& Bhadani VK[11] observed the occurrence of this tumor in small numbers. Though it is common in females as observed in our study, with upper eyelid predilection ,there are reports in lower eyelid (Bhanudevi et al & Maurya RP et al)[5,36]. Similarly there are reports in males (Kutty MK & Hussain and Gogoi)[32,21],but more common in females of 6-7 decades of age(Bhanudevi et al)[5] and this corroborates our findings in the present study. Further, Upper eyelid involvement was more common as reported in our study ,probably due to large number of Meibomian glands in upper eyelid.

Benign Tumors : Overall incidence of skin adnexal tumors is very low in Indian population and benign adnexal tumor incidence is more compared to malignant ones.. In the present study,13 (59%) were benign and 9 (41%)were malignant out of 22 Skin tumors encountered .It was 80.36% of Benign compared to 19.64% of malignant as observed by Ankit sharma et al[4] in their study and similar results were seen in studies of Radhika et al ,Reddy et al,and MOA Samaila who reported 77.14%,69.41%,& 88.5%benign and 29.63%,30.59%,and 11.5% malignant leisons respectively[48,49,38]. In the present study,out of 13 Benign tumors observed,8 were of Adnexal,2 were of Epidermal,1 was of Melanocytic and 2 were of Miscellaneous origin.

Epidermal tumors: 2 cases of Squamous papilloma were reported (15.4%) in variation with the findings of Gandhi& Vijayaraghavan[17] ,Bari v et al and Karki et al[7,26] who reported incidence of 12.5% ,45.2% &11.9% respectively .Bari v et al[7] has included Squamous papilloma in the class of Verruca as it was associated with HPV infection .Sushma et al[64] observed incidence of 17.5% of squamous papilloma with female dominance,coinciding with our study showing 100% occurrence in females.

Adnexal tumors: 2 cases of Eccrine acrospiroma, 4 cases of Pilomatricoma,1 case of Keratoacanthoma and 1 case of Trichofolliculoma were reported under adnexal origin.

Pilomatricoma: In our study 4 cases were encountered out of 13 cases (30.7%) of Benign tumors whereas Kaur k et al & Ankit sharma et al[28,4] observed incidence of 28.2% & 21.4% respectively. Similarly, Shubha R Bhat et al,Manibharati R et al ,Pachori G et al ,Saiprasad et al , Bordia S et al and Sugumar C et al[58,35,47,52,8,66] observed Pilomatricoma as the commonest adnexal tumor in their studies. Higher incidence in the age group of 60 yrs & above was observed by us in correlation with Gundalli et al[18] but in variation with the results of Saiprasad& Ankit sharma who reported 40 yrs age group as the most affected.[52,4]

Eccrine Acrospiroma—— 2 cases were reported in our study out of 15 adnexal tumors (2.5%) similar to results of Kaur K etal (1.8%)[28]but in variation of reports by Sanapala et al (7.8%)[55] and Saiprasad et al (15.6%)[52] .One tumor was observed in a female child of 3 yrs in foot , similar to Saiprasad who quoted extremities and head as frequent sites.& the other was in a male of 65yrs on back region. Keratoacanthoma— only one case (1.25%)out of 15 adnexal tumours was reported in our findings ,similar to the results of Bari v et al (1.5%)[7], Karki et al(1.4%)[26] and Gandhi & Vijayaraghavan (1.25%)[17].But MVC de Silva et al[40] observed 12 cases in 65 yrs age group, mostly in upper limbs.

Some authors included Keratoacanthoma under Epidermal group and some under Adnexal ; but we included it in adnexal following Ackerman's surgical Pathology.

Trichofolliculoma—we have noticed low incidence(1.25%) in our study ,similar to results of Sanapala et al , Bordia S et al, Bari V et al and Gundalli et al.[55,8,7,18]. But Ankit sharma et al and Saiprasad et al [4, 52] reported higher incidence of 3.57% & 9.37% (in the age group of 40)respectively and Gundalli et al [18] noticed this tumor in 0-9 yrs age group.

Melanocytic tumors: one case of congenital Melanocytic nevus was observed in our study. But Sushma et al[64] reported 7 cases, Swagato & Momota 5 cases[67],Bari V et al 6 cases[7] ,Gundalli et al 13 cases[18] ,14 cases by Sheenam Azad[59] and 30 cases (21%) by Karki D et al[26] in their studies. we noticed this tumor in a male of 21 yrs similar to Mehar R (11-20 yrs)[37] and Sheenam Azad(21-40 yrs group)[59];but in variation with that of Sushma et al (30-50 yrs age group)[64].Different types like Intradermal nevus,compound nevus, Blue nevus were reported by different authors. .

One case of Dermoid tumor (Mature teratoma) in a female (21-40 age group) and one case of Giant cell tumor of tendon sheath in a male of 21 yrs age were also observed in our study.

Tumor-Like Skin Lesions:

In the present study 58 tumor like skin lesions were observed out of 3625 total biopsies examined retrospectively, showing an incidence of 1.6%, coinciding with the findings of Bari V etal[6] who reported incidence of 1.9%. In a similar study by Karki D etal[26]in Nepal ,the incidence was 0.7%. But MVC de silva etal[40] observed 500 (42%) tumor like skin leisons out of 1181 cutaneous tumors studied in Srilankans. Similarly, Gandhi& Vijayaraghavan[17] in their study observed 98 (61%)Tumor like leisons in 160 cases of epidermal Skin tumors analysed and Sushma etal[64] observed 89(65%) tumor like lesions out of 136 non neoplastic skin lesions in their study. We observed 42 lesions (72.4%) in males and 16 lesions(27.6%) in females,with a M:F ratio of 2.6:1 compared to 57.7% & 42.2% in males and females respectively reported by Bari V etal[6] with M:F ratio of 1.35:1,showing male preponderance. Maximum number of lesions (31%) accounted in 2nd& 3rd decade of life in our study in agreement with the findings of Karki D etal[26],but in variation with the results of Bari v etal[6] who reported higher incidence in 4th& 5th decade of life ,while Gandhi & Vijayaraghavan[17] observed higher incidence in 2nd and 4th decade. The comparative incidence of different tumourlike skin lesions reported in India by various authors is shown in Table 10.

Table10 -COMPARATIVE INCIDENCE OF DIFFERENT TUMOR-LIKE LEISONS

Type of tumor-like leison	MVC desilva etal1999,(n=500)	Bari v etal2014(n=175)	Gandhi&Vijayaraghavan2018(n=98)	Karki D etal 2018(n=53)	Sushma et al 2018(n=89)	present study(n=58)
Epidermal cyst	37.00%	59.40%	36.30%	52.80%	73.00%	69.00%
Dermoid cyst	2.40%	13.10%	12.50%	26.40%	12.40%	10.40%
Trichilemmal cyst	6.00%	12.00%	10.60%	20.80%	7.90%	1.70%
Proliferating trichilemmal cysts	1.00%	0	0	0		5.20%
Xantoma	4.40%	0	0	0		1.70%
Haemangioma	21.80%	0	0	0		1.70%
Idiopathic calcinosis	0	0	0	0		1.70%
Haemartoma	0	0	0	0		1.70%
Fibroepithelial polyp	0	6.30%	0	0		1.70%
Keloid	1.20%	8.00%	0	0		0
Epideraml nevus	5.80%	0.60%	0	0		0
Hypertrophic scar	0	0.60%	0	0	1.10%	0
Tumoral calcinosis	0	0	0	0		1.70%
Nodular tenosynovitis	0	0	0	0		1.70%
Marjolina ulcer/hyperplasia	0	0	0	0		1.70%
Steatocystoma multiplex	1.40%	0	1.00%	0		0
Eruptivevellus hair cyst	0	0	1.25%	0		0
Dermatofibroma	18.80%	0	0	0	0	0
Implantation dermoid	0.00%		0	0	1.1	0
others(tumours)*	0	0	*38.35	0	0	0

Epidermal cysts: 40 epidermal cysts were observed in our study with 34 in males & 6 in females,showing male dominance in agreement wth the findings of Bari v etal[6] ,Chandrasekaran V etal[13] and Sushma etal[64] .This significant male dominance in these studies reflects reluctance of women to seek Medical help for this simple lesion,may be also due to rural background& low awareness.38% of cysts occurred in Head and Neck region in our study in agreement with the findings of Karki D etal (31%)[26] ,Chandrasekaran v etal (19%)[13] & Bari v etal (46%)[6].

Histologically ,these cysts are lined by stratified squamous epithelium with granular cell layer and filled with keratin. Similar findings were reported by Chandrasekaran V etal13], Vandeweyer E& Reynard N[68] and Bari V et al[6].

Dermoid cysts: we have encountered 6 Dermoid cysts (10.3%)with equal distribution among both sexes. But Bari et al observed 13.1% incidence[6] with slight female preponderance . MVC de silva etal observed 12 cysts (2.4%)in their study[40]& Gandhi and Vijayaraghavan reported 20 cysts(12 .5%)[17] .Sushma et al[64] observed male preponderance. We observed 5 cases in first 2 decades of life in line with the observations made byBari v etal[6] .Histolologically all cysts showing wall lined by stratified squamous epithelium with focal granulomatous reaction and adnexal structures .

Fibroepithelial polyp: In our study,one case (1.7%)was observed in male of 35 yrs in right axilla region in contrast to the reported incidence of 6.3% with male preponderance by Bari v et al[6]. Histopathology of the polyp showed polypoid lesion covered by epidermal lining .

Trichilemmal cysts: we have encountered low incidence of 1.7% compared to 20.8%,10.6%,12.0% 7.9% and 6.0% reported by Karki etal,Gandhi etal, Bari etal ,Sushma etal and Mvc de silva etal respectively[26,17,6,64,40]. In A female of 30 yrs age the lesion was

noticed on scalp ,measuring 3x2 cms and Histopathology showed lesion lined by stratified squamous epithelium with focal areas of strong abrupt keratinisation with areas of calcification,cholesterol clefts and giant cells.

Proliferating Trichilemmal cysts: In our study,3 cases were observed (5.2%);one in a male of 65 yrs age & 2 in females of 60&72 yrs age with scalp as common site. MVC de silva et al[40] reported 5 cases .Histologically all 3 lesions showed multiple irregular shaped lobules of squamous epithelium with abrupt keratinisation.

Idiopathic calcinosis: one case was reported in our study in a female aged 65 yrs on right forearm,histologically showing hyperplastic acanthotic stratified squamous epithelium with dense lymphoplasmocytic inflammation in dermis,foci of calcification surrounded by foreign body giant cell reaction.

one case of Xanthoma in a male aged 75 yrs on left toe was observed in our study.MVC de silva reported 22 cases of such leisons.

A single case of Hemartoma in a male aged 21 yrs was observed in our study.

We observed one case of Hemangioma (1.7%) in 20 yrs female on left temporal region. But de silva etal[40] reported 108 cases (21.8%) with scalp & face as sites in their study.

One each case of Nodular tenosynovitis,Tumoral calcinosis & Marjolin ulcer with hyperplasia were observed in our study,but no citations could be located

CONCLUSION :

The Incidence of skin tumours/ lesions was more common in India like any other region in world. Benign skin tumors outnumbered the malignant tumours. Most of the malignant tumors occur in older age group of 41-60 years. Skin tumors can occur any where in the body, however Head & neck region is most common site. Malignant melanoma was the most common malignant tumor followed by Meibomian carcinoma. Though, Tumor like lesions are diagnosed by their clinical presentation, Histopathology remains the gold standard to rule Out malignancy and mandatory for correct diagnosis and treatment.

Limitations to this study: The retrospective nature of the study might have resulted in loss of some data.

The absence of facility of Histochemistry (in our department)for enzymes to establish exact nature of tumors.

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