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CLINICO-DEMOGRAPHIC PROFILE AND HISTO-MORPHOLOGY OF DIFFERENT SKIN TUMORS: A CROSS-SECTIONAL STUDY

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ABSTRACT

Background: Wide range of diseases can develop from the skin including tumors from surface epidermis. The distinction between benign and malignant neoplasm are rather more difficult to define when they appear in skin than when found elsewhere and histopathological examination is frequently required to establish a definitive diagnosis. Diagnosis of any skin tumors can be done by correlating clinical features and histological features. **Objectives:** To classify various skin tumors as per WHO classification and study their variations according to age, sex and site and to study the histomorphology of different skin tumors with ancillary techniques whenever necessary. **Methodology:** The present study was carried out in the department of pathology in MIMSR Medical College, a tertiary care centre. This study includes tumors of epidermis along with melanogenic tumors and skin appendageal tumors without restricting the study to any particular age group. After fixation, gross examination of all the biopsies and resected specimens was done. Slides were studied under light microscope and the final diagnosis was given. Demographic variables were compared for different types of tumors. **Results:** The incidence of skin neoplasm was 2.4%. Out of total 60 cases, 24(40%) were benign and 36(60%) were malignant. As per WHO classification, Keratinocytic tumor (73.33%) was most common. Melanocytic tumor and Skin adnexeal tumor were observed in 13.33% cases each. Out of the 8 melanocytic tumors 6 were malignant. Benign lesions were common in younger individuals (less than 40 years of age) and in females, whereas malignant lesions were common as age increases and in males. Head and neck region (45%) was most common site observed where skin lesions were present followed by extremities (41.67%). Majority of the benign (66.67%) and malignant lesions (77.78%) were of epidermal origin. Verruca vulgaris and Verruca plantaris were the most common benign lesions. Out of total 36 cases of malignant skin tumors, 17(47.22%) were of SCC, 9(25%) were of BCC and 6 (16.67%) were of malignant melanoma. Head and neck region was the most common site for BCC and SCC of skin. **Conclusion:**

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Benign tumors were common in younger age group and in females whereas malignant tumors were commonly seen in males and displayed an ascending trend in age. SCC is the commonest malignant skin tumour.

INTRODUCTION

Skin was considered primarily a passive protective barrier to both fluid loss and mechanical injury. Over the last few decades, however, studies have demonstrated the skin to be a complex and largest organ in the body.[1] Wide range of diseases can develop from the skin including tumors from surface epidermis.[2]

Though Skin cancers are relatively uncommon malignancies worldwide, the incidence of skin cancers has progressively increased particularly that of cutaneous melanoma over the last few decades.[3] In India, the incidence of skin malignancies is low, constituting about 1-2% of all the diagnosed cancers. BCC is the commonest skin cancer worldwide, but various studies from India have reported SCC as the most prevalent skin malignancy.[4] There are a number of intra-epidermal proliferative disorders (dysplasias) that may be precursors of squamous cell carcinoma. Melanocytic lesions are important primarily because of malignant melanoma which is the single most common potentially lethal neoplasm of skin.[5]

Differences in the trends and rates of skin cancer may be due to variation in skin types, geographical latitudes, occupational exposure, behaviour in terms of sun exposure and skin protection and differences in disease awareness and surveillance.[6] SCC commonly occurs on sun-damaged skin in white populations. Risk factors for the development of SCC in darkly pigmented individuals are chronic scarring and areas of chronic inflammation. Development of BCC has been correlated with prolonged, intensive UV exposure, with BCC occurring most commonly after the fifth decade of life.[7]

Cutaneous appendages gives rise to bewildering number of neoplasms more than accounted. The diagnosis of adnexal neoplasms presents unique difficulties, in part, related to wide variety of tumors, complicated nomenclature and substantial frequency of one lesion exhibiting histologic features of two or more adnexal lines.[8]

The distinction between benign and malignant neoplasm are rather more difficult to define when they appear in skin than when found elsewhere and histopathological examination is frequently required to establish a definitive diagnosis. Diagnosis of any skin tumors can be done by correlating clinical features and histological features.[2] Keeping in view these facts, the present study was done to classify various skin tumors as per WHO classification and study their variations according to age, sex and site and to study the histomorphology of different skin tumors with ancillary techniques whenever necessary.

MATERIAL AND METHODS

The present study was carried out in the department of pathology in MIMSR Medical College, a tertiary care centre. This study includes tumors of epidermis along with melanogenic tumors and skin appendageal tumors without restricting the study to any particular age group. Inflammatory conditions, epidermal cysts, soft tissue tumors, haematological tumors of skin, nonneoplastic lesions and all tumors arising from mucocutaneous junction such as lips, glans penis and eyelid margin were excluded. The study was done during between October 2022 to October 2024 (2 years). Data regarding history, clinical examination findings and clinical diagnosis was collected.

All biopsies and resected specimens received in histopathology section were immediately fixed in 10% formalin for 24 hrs. After fixation, gross examination was done

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which included size, shape, colour, consistency and cut surface. Multiple sections of specimen were taken. Tissue cassettes with unique numbers given to them in the gross room were carried throughout laboratory procedures. Sections were dehydrated in alcohol, cleaned in xylol and embedded in paraffin wax. The corresponding blocks were prepared. 3-to-5-micron thick sections were cut from each paraffin block and stained with hematoxylin and eosin stain. Slides were studied under light microscope and the final diagnosis was given.

Staining procedure for hematoxylin and eosin staining

First deparaffinise of the sections, then keep in xylene - two changes 5 minutes each followed by keep in absolute alcohol - 5minutes. Later keep in 95% alcohol - 5 minutes and keep in water - 5 minutes. For 5 minutes, keep in haematoxyline solution and wash and keep in water for blueing - 5 minutes. Differentiate in 1% acid alcohol was done for 5 to 10 seconds. Wash well in tap water until sections are again" blue" (10-15 minutes) then stain with 1% eosin-Y for 10 minutes. Wash in running tap water for 1-5 minutes and dehydrate through ascending grades of alcohol. It should be clear in xylol and mount in DPX (dextrene polystyrene xylene). Interpretations are - Nuclei if blue black, Cytoplasm if different shades of pink, Keratin if deep pink, Red blood cells if orange red and Melanin if black.

Quantitative data was presented in terms of mean and standard deviation and percentage for qualitative data. Ethical clearance has been obtained from Ethical committee of institution.

RESULTS

Total 60 cases presented as skin tumors during the study duration. The cases were diagnosed as benign and malignant histologically.

Incidence of skin cancer:

The department has received a total of 15763 specimens for HPR during the study period. Out of these 2608 were diagnosed as cancers of various sites in the body and cancers of skin accounted for 60 cases (2.3%) of this.

Distribution of patients according to grading and WHO classification of tumor:

It was observed that out of the total 60 cases 24(40%) were benign whereas 36(60%) were malignant tumor. The ratio of benign to malignant was 1: 1.5. According to WHO classification Keratinocytic tumor (73.33%) was the most common tumor type in the present study. Melanocytic tumor and Skin adnexeal tumor were observed in 13.33% cases each.

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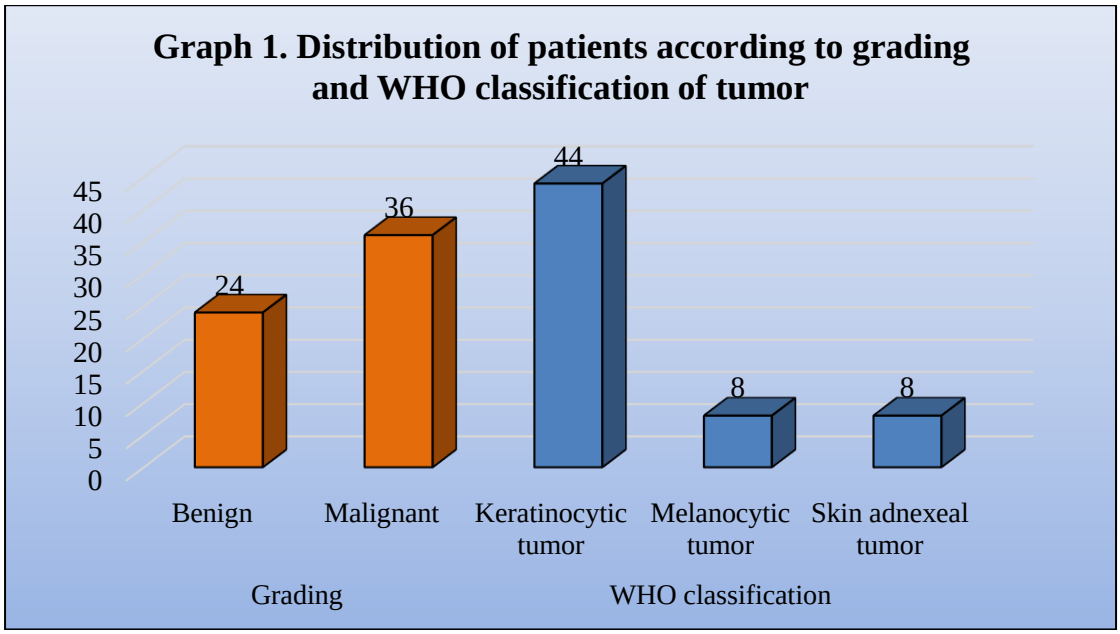
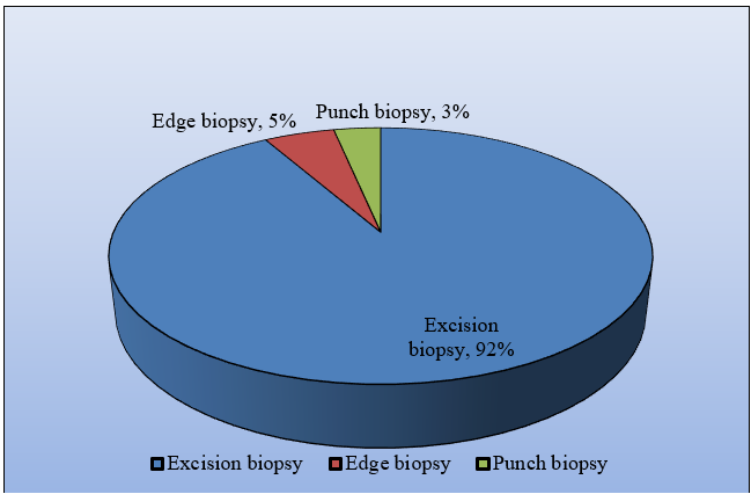


Distribution of patients according to type of biopsy:

Among the various method used for collecting biopsy excision biopsy (91.67%) was the most common method. Edge biopsy was done in 5% patients whereas punch biopsy was done in 3.33% patients.



Graph 2: Distribution of patients according to type of biopsy

Table 2: Different characteristics of benign and malignant tumors of skin:

Variables		**Benign**	**Malignant**	**X^2, p value**
Type of tumor	Keratinocytic tumor	16(66.7%)	28 (77.8%)	0.39, p >0.05 (NS)
	Melanocytic tumor	2 (8.33%)	6 (16.7%)	
	Skin adnexeal tumor	6 (25%)	2 (5.6%)	
Age	10-29 Years	9(37.00%)	1(2.78%)	**21.17, p<0.05 (significant)**
	30-49 Years	9(37.50%)	12(33.33%)	
	50-69 Years	6(25%)	17(47.22%)	
	>70 Years	0(0.00%)	6(16.67%)	

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Sex	Male	11(45.83%)	27(75%)	**5.28, p<0.05 (significant)**
	Female	13(54.17%)	09(25%)	
Site	Head and neck	11(45.83%)	17(47.22%)	1.03, 0.597 (NS)
	Extremities	9(37.50%)	16(44.44%)	
	Trunk	4(16.67%)	3(8.33%)	
Type of Biopsy	Excision biopsy	23(95.83%)	32(88.89%)	2.2, 0.339 (NS)
	Edge biopsy	0(0%)	3(8.33%)	
	Punch biopsy	1(4.17%)	1(2.78%)	
Origin of tumor on microscopy	Epidermal	16(66.67%)	28(77.78	7.59, 0.209 (NS)
	Melanocytic	2(8.33%)	6(16.67%)	
	Hair Follicle Differentiation	2(8.33%)	0(0.0%)	
	Sebaceous Differentiation	1(4.17%)	0(0.0%)	
	Apocrine Differentiation	1(4.17%)	0(0.0%)	
	Eccrine Differentiation	2(8.33%)	2(5.56%)	
Total		24(100%)	36(100%)	

Out of 60 skin tumors, malignant keratocytic tumors were most common (28), followed by benign tumors of keratocytic tumors (16). Out of the 8 melanocytic tumors 6 were malignant, it might be due to unreported case of pigmented moles/nevus. The difference observed in various types of benign and malignant tumors was not statically significant. Benign lesions were common in younger individuals (less than 40 years of age). Malignant lesions were common as age increases. The difference observed in age wise distribution in benign and malignant lesion was statically significant.

Benign lesions were common in females (54.17%) whereas malignant lesions were common in males (75%). And the sex wise difference observed in the benign and malignant lesion was statistically significant. Head and neck region (45%) was the most common site observed where skin lesions were present followed by extremities (41.67%). In benign and malignant lesions head and neck region was the most commonly affected region.

Majority of specimen which were on hostopathological examination were diagnosed as benign and malignant were collected by excision biopsy. Three specimen (8.33%) collected by edge biopsy were diagnosed as malignant lesion. Majority of the benign and malignant lesion was of epidermal origin. In total 73.33% tumors were of epidermal origin. On microscopy melanocytic and skin adenexal origin of tumour was observed in 13.33% cases each. Majority of the skin adenexal tumors were benign in nature.

Table 2: Age and sex-wise distribution of lesions as per WHO classification;

Variables		**Keratinocytic tumor**	**Melanocytic tumor**	**Skin adnexeal tumor**	**X^2, p value**
Age	10-29 Years	6(13.64%)	1(12.5%)	3(37.5%)	13.2, p>0.05 (NS)
	30-49 Years	13(29.54%)	5(62.5%)	3(47.5%)	
	50-69 Years	20(45.45%)	1(12.5%)	2(25%)	
	>70 Years	5(11.36%)	1(12.5%)	0(0%)	
Sex	Male	27(61.36%)	6(75%)	5(62.5%)	0.64, p>0.05 (NS)
	Female	17(38.64%)	2(25%)	3(37.5%)	
Total		44(100%)	8(100%)	8(100%)	

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According to WHO classification it was observed that incidence of keratinotypic tumor was increasing with age. Melnocytic tumor was seen most commonly (37.5%) in 40-49 years of age group. Skin adnexal tumor was observed most commonly in10-19 years of age group. The age wise difference observed in the classification was not statistically significant. Keratinocytic tumors in 27 cases of male and 17 cases of female group. Melanocytic tumor was observed in 6 males (75%) whereas Skin adnexeal tumor was observed in 5 male cases.

Site wise distribution of different benign and malignant tumors of skin:

It was observed that among the benign tumors epidermal tuors were the most common type and verruca vulgaris was the most common tumor. It was followed by Verruca plantaris and Seborrheic keratosis. Squamous cell carcinoma (47.22%) was the most common malignant variant of skin tumor of epidermal origin which was followed by basal cell carcinoma (25%). Malignant melanoma was diagnosed in 16.67% cases.

Table 3: Site wise distribution of different benign and malignant tumors of skin

Types of Tumors			**Head & neck**	**Extremities**	**Trunk**	**Total**
Benign Tumors	Keratocytic tumor	Pigmented seborrheic keratosis	2	0	0	2
		Seborrheic keratosis	2	0	2	4
		Verruca plantaris	0	4	0	4
		Verruca vulgaris	1	5	0	6
	Melanocytic tumor	Blue nevus	1	0	0	1
		Intradermal nevus	1	0	0	1
	Skin adenexal tumor	Cylindroma	0	0	1	1
		Nevus sebaceous	1	0	0	1
		Nodular hidroadenoma	0	0	1	1
		Pilomatricoma	1	0	0	1
		Proliferating trichelemmal tumor	1	0	0	1
		Syringoma papilliferum	1	0	0	1
Total			11	9	4	24
Malignant Tumors	Keratocytic tumor	BCC	8	0	1	9
		SCC	9	8	0	17
		Verrucous carcinoma	0	2	0	2
	Melanocytic tumor	Malignant melanoma	0	6	0	6
	Skin adenexal tumor	Malignant cylinroma	0	0	1	1
		Porocarcinoma	0	0	1	1
Total			17	16	3	36

Head and neck region was the most common observed site for benign lesions in all the variants of skin tumors. (i.e Keratocytic, Melanocytic and Skin adenexal tumor). It was observed that head and neck region was involved most commonly in malignant Keratocytic tumor. All the six Malignant Melanocytic tumors were observed on extremities whereas malignant skin adenexal tumors were seen on trunk area.

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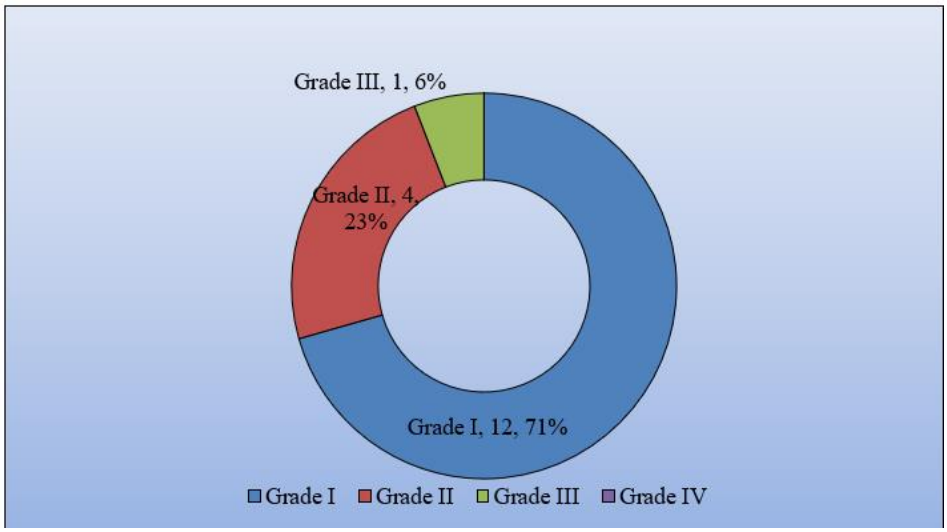
Broder's grading of squamous cell carcinoma (n=17):

While studying squamous cell carcinoma it was observed that majority of the cases were of grade I Broder's classification. No case of grade IV class observed in the study.



Graph 3: Broder's grading of squamous cell carcinoma (n=17)

Histological types of basal cell carcinoma

Basal cell carcinomas showing no differentiation were categorized as solid BCC. It was seen that majority of the BCC were solid on histology whereas pigmented type was observed in one case.

DISCUSSION

The present study was conducted with objective to study the frequency and histomorphology of different skin tumors. During the present study period, total 60 specimens were analyzed in the Department of Pathology, of the study institute to achieve the above mention objectives.

Incidence of neoplasms

During the study duration total 15763 specimens for HPR were received in the department. Out of these 2608 were diagnosed as cancers of various sites in the body and cancers of skin accounted for 60 cases of this. Thus, the incidence of skin tumor was 2.3% in the study. The neoplasm of skin in different hospital-based studies in India ranged from 1.87% (Chakrvorthy RC *et al.*[9]) to 8.16% (Kapoor R *et al.*[10]). It was 2.3% in the present study. In the present study it was observed that out of the total 60 cases, 24(40%) were benign whereas 36(60%) were malignant tumor. The ratio of benign to malignant was 1:1.5.

Age and sex comparison of benign and malignant tumors

Benign lesions were observed commonly in younger individuals (less than 40 years of age) whereas malignant lesions were common as age advances. The difference observed in age wise distribution in benign and malignant lesion was statically significant. (X^2=21.17, df=6, $p<0.05$) Thus the wide age range was observed in the study. Saimila MOA *et al.*[11] and Solanki RL *et al.*[12] also observed wide age range of skin neoplasm in their study. And they also observed high incidence of benign, lesion in younger age group. Azam S *et al.*[13] and Gayathri S *et al.*[14] also observed similar finding to the present study. According to Mohammad T *et al.*[15]

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skin malignancy occur mainly in the sixth, seventh, and later decades of life, which was similar to our study.

It was seen that benign lesions were common in female patients (54.17%). It was also seen that malignant lesions were common in males (75%) which are consistent with the findings of Deo SV *et al.*[4], Katalinic A *et al.*[16], Kulkarni PV *et al.*[17] and Kapoor *et al.*[10].

BENIGN SKIN TUMOURS

In the present study, it was observed that out of the total 60 cases, 24(40%) were benign tumor. The most common site of benign skin lesions were head and neck (45.83%) followed by extremities (37.50%). It was observed that majority of the benign lesion was of epidermal origin (66.67%). On microscopy melanocytic and skin adenexal origin of tumour was observed in 8.33% and 25% respectively.

Similar findings were seen in the study by Vaishnav and Dharkar and Reddy *et al.*[18], benign tumours formed the majority. In study done by Sonam S. Nandyal *et al.*[19]**,** where out of 135 skin tumors, 46 (34.04%) were benign.

Age incidence of Benign tumors

In present it was observed that benign lesions were common in younger individuals (less than 40 years of age). The highest percentage of lesions were seen in age group of 20-39 years (37.50%) followed by 0-19 years (25%). Similarly, in study done by Sonam S. Nandyal[19] *et al.* benign lesions were maximum in age group 20-39 years (34.78%).

Sex distribution of benign Tumors

It was observed that benign lesions were common in females (54.17%) whereas malignant lesions were common in males (75%). Similarly, findings were seen in study conducted by Sonam S. Nandyal *et al.*[19] where benign lesions were more common in females (60.87%).

Incidence of benign appendageal skin tumours

There were total 6 cases of benign appendageal tumours in the present study. The occurrence of sweat gland tumours (50%) was higher in the present study. The other appendageal tumours were hair follicle tumours (33.33%) followed by sebaceous gland tumours (16.67%) The occurrence of sweat gland tumours was also higher in the studies done by Solanki RL *et al.*[20] (53.2%) and Nair SP *et al.*[21] (57.56%).

Benign tumours of Epidermal Origin (Keratinocytic Tumours)

In the present study among Keratinocytic tumours majority of tumours were verruca (62.5%) followed by seborric keratosis (37.5%). Among 10 cases of verruca, 6 cases were verruca vulgaris and 4 cases of verruca plantaris was observed.

Seborrheic keratosis

In the present study 4 cases of Seborrheic keratosis were encountered. In majority of the cases age range was 50-69 years. Out of 4 cases, 2 were located on the trunk and 2 were on head neck region. The findings are consistent with those of Kirkham N *et al.*[22].

Benign melanocytic nevus

In this study among 02 cases of being melanocytic tumour, 1 was intradermal nevus and 1 was blue nevus. Shoko M *et al.*[23] has analysed 531 cases of nevus out of which 15 were junctional, 134 cases were compound, and 382 cases were dermal.

Incidence of benign hair follicle tumours

In the present study among two benign hair follicle tumours, we found one proliferating trichilemmal tumour (50%) and one Pilomatricoma (50%). The case of Pilomatricoma was seen in a 15-year female patients with lesion on right cheek. Whereas proliferating trichilemmal

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tumour was seen in a 35-year male patient with lesion on face region. In the study by Solanki RL *et al.*[20] and Kartha *et al.*[24] the occurrence of pilomatricoma was higher.

Incidence of benign tumors of sweat gland

There were 3 patients with sweat gland differentiation accounting for 50% of the benign adnexal tumours. In the present study we found each specimen of hidradenoma (33.33%), cylindroma (33.33%) and syringo-cystadenoma papilliferum (33.33%). In the study by Solanki RL *et al.*[20] hidradenoma (27.6%) was the most common followed by syringo-cystadenoma papilliferum (23.4%)

The case of Hidradenoma and cylindroma were observed in male patients in the age group of 30 -50 years. Both present with lesion over trunk region. While the patient of syringo-cystadenoma papilliferum presented with lesion on trunk. The case of syringo-cystadenoma papilliferum was a 12-year-old female patient.

MALIGNANT TUMORS

Squamous cell carcinoma:

In the present study out of 36 cases of malignant skin tumors, 17(47.22%) were of squamous cell carcinoma. Thus, SCC was the commonest tumor and similar findings were also reported by Budharaja SN *et al.*[25], Deo SV *et al.*[4] and Chakravorthy RC *et al.*[9].

Site distribution in squamous cell carcinoma:

While classifying squamous cell carcinoma according to Broder's classification, it was observed that majority (70.59%) of the cases were belonging to grade I Broder's classification. It was followed by grade II (23.53%). No case of grade IV class observed in the study.

Verrucous carcinoma

Verrucous carcinoma is a low-grade variant of squamous cell carcinoma. Two cases verrucous carcinoma were diagnosed in the present study. In one patient the lesion was over the right foot and in other case it was on left leg. In a study done by Kotwal M *et al.*[26] majority of the lesion were on extremities. Schwartz RA *et al.*[27] also observed foot as the most common site of occurrence.

Basal cell carcinoma

In the present study the incidence of basal cell carcinoma was 25%. The incidence of BCC in other studies ranged from 12% (Chakravorthy RC *et al.*[9]) to 28% (Solanki *et al.*[12]). While site of BCC, it was observed that majority of cases (88.89%) were seen on head and neck which was consistent with the findings of Solanki RL *et al.*[12] (94%), Chakravorthy RC *et al.*[9] (90%) and Budhraja SN *et al.*[25] (78%).

Malignant Melanoma:

The incidence of malignant melanoma was 6.7% in the present study. While according to various Indian studies malignant melanoma accounted for 7% to 29.4% of all skin cancers.

Malignant skin appendageal tumors:

Among total 8 skin appendageal tumors, 2 were malignant. One case was diagnosed as malignant cylinroma which was 40-year-old female. Second case was diagnosed as Poro-carcinoma which was seen in 60 years male patient. The lesion in both cases was on trunk.

CONCLUSION

The skin tumors constitute a small but significant proportion of patients with cancer. Benign tumors were common in younger age group and more common in females where as malignant tumors were commonly seen in males and displayed an ascending trend in age. Because of

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complexity of skin, a wide range of diseases can develop from the skin including tumors from surface epidermis, epidermal appendages and dermal tissue.

SCC is the commonest malignant skin tumour. Histopathological study is one of the most valuable means of diagnosis in dermatopathology and the diagnosis of skin tumours can be done by correlating clinical features, gross and histological appearances.

REFERENCES

1. Souto EB, Fangueiro JF, Fernandes AR, Cano A, Sanchez-Lopez E, Garcia ML *et al.* Physicochemical and biopharmaceutical aspects influencing skin permeation and role of SLN and NLC for skin drug delivery. Heliyon. 2022 Feb 11.
2. Shivaprasad P N, Prabhu M H, Dr. Siraj A S *et al.* Benign tumors of skin. Global J of Medical research: Microbiology and Pathology 2014; 14 (3): 10-14.
3. Arnold M, Singh D, Laversanne M, Vignat J, Vaccarella S, Meheus F, Cust AE, de Vries E, Whiteman DC, Bray F. Global Burden of Cutaneous Melanoma in 2020 and Projections to 2040. JAMA Dermatol. 2022 May 1;158(5):495-503.
4. Supekar BB, Tomar SS, Wankhade VH, Bhushan R, Singh RP, Bhat DM. Clinical Spectrum of Cutaneous Malignancies in Central India: A Retrospective Study. Indian J Dermatol. 2021 May-Jun;66(3):284-290.
5. Khayyati Kohnehshahri M, Sarkesh A, Mohamed Khosroshahi L, HajiEsmailPoor Z, Aghebati-Maleki A, Yousefi M, Aghebati-Maleki L. Current status of skin cancers with a focus on immunology and immunotherapy. Cancer Cell International. 2023 Aug 21;23(1):174.
6. Parker ER. The influence of climate change on skin cancer incidence–a review of the evidence. International journal of women's dermatology. 2021 Jan 1;7(1):17-27.
7. Adinarayan M, Krishnamurthy SP. Clinicopathological evaluation of nonmelanoma skin cancer. Indian J Dermatol. 2011; 56: 670-2.
8. Plachta I, Kleibert M, Czarnecka AM, Spałek M, Szumera-Ciećkiewicz A, Rutkowski P. Current Diagnosis and Treatment Options for Cutaneous Adnexal Neoplasms with Apocrine and Eccrine Differentiation. Int J Mol Sci. 2021 May 11;22(10):5077.
9. Charkravorthy RC and Choudhuri DR. Malignant neoplasms of the skin in Eastern India. The Indian Journal of Cancer. 1968; vol 5:133-144.
10. Kapoor R, Goswami KC. Pattern of cancer in Jammu region (Hospital based study 1978-89). Ind J Cancer. 1993; 30: 67-71.
11. Saimila MOA. Adnexal skin tumors in Zaria, Nigeria. Annals of African Medicine 2008; 7(1): 6-10.
12. Solanki RL, Arora HL, Anand VK, Gaur SK, Gupta R. Basal cell epithelioma: A clinicopathological study of 172 cases. Indian J Dermatol Venerol Leprol. 1989; 55:33-43.
13. Azam S, Mubarik A, Ahmad M. Histopathological study of benign melanocytic nevi. Pakisthan Armed Forces Medical Journal. 2008; (2):135-38.
14. Gayathri S, Alavandar E and Kumar KA. Clinicopathological study of melanocytic tumors of skin. Int J Pharm Bio Sci. 2013; 4(1):416 – 21.
15. Noorbala MT and Kafaie P. Analysis of 15 years of skin cancer in central Iran. Dermatology Online Journal. 2007; 13 (4):1.
16. Katalinic A. Epidemiology of cutaneous melanoma and non-melanoma skin cancer in Schleswig- Holstein, Germany: incidence, clinical subtypes, tumour stages and localization. British Journal of Dermatology. 2003; 149:1200-06.

ISSN: 0975-3583,0976-2833 VOL15, ISSUE 11, 2024

17. Kulkarni PV, Jaiswal SS. Profile of malignancies at medical college, Ambojogai (15 years retrospective study). Ind J Cancer. 1996; 33:31-6.
18. Reddy KM, Veliath AJ, Nagarajan S and Arora AL. A clinicapathological study of adnexal tumours of skin. Indian J Med Res. 1982 June; 75: 882-889.
19. Sonam S Nandyal, Rekha B. Puranik. Study of demographic profile of skin tumors in a tertiary care hospital. Int J Cur Res Rev. 2014 Aug; 6 (16):24-28.
20. Solanki RL, Anand VK. Neoplasms of sweat gland. Indian J of Dermatol Venerol Leprol. 1989; 55:108-112.
21. Nair SP. A clinicopathological study of skin appendageal tumours. Indian J of Dermatol Venerol Leprol. 2008; 74:108-550.
1. 31. Kirkham N. Tumours and cysts of epidermis. In Lever's histopathology of skin. 9th ed. Philadelphia: Lippincott Raven; 2005. p. 805-866.
22. Shoko M. The histopathological analysis of 531 cases of melanocytic nevus of the face. Japanese Journal of Dermatology. 2002; 112 (6): 803-810.
23. Kartha CC, Shankar SK, Bhuyan UN. Benign mixed tumour of skin--a histopathologic study of 7 cases. Indian J Pathol Microbio.1980 Jan; 23(1):1-6.
24. Budharaja SN, Pillai VCV, Periyanagam WJ, Kaushik SP and Bedi BMS. Malignant neoplasms of skin in Pondicherry- a study of 102 cases. The Indian Journal of Cancer. 1972: 284-295.
25. Kotwal M, Poflee S and Sudhakar B. Carcinoma cuniculatum at various anatomical sites. Indian J Dermatol. 2005; 50: 216-20.
26. Schwartz RA. Verrucous carcinoma of skin and mucosa: Continuing medical education. J Am Acad of Dermatol.1995 Jan; 32(1):1-15.