

Clinicohistopathological Study of Skin Adnexal Tumors

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Abstract

Background: To study the histopathological features of skin adnexal tumors and with respect to age, sex and site of distribution.

Material and Methods: This study was undertaken in department of pathology, Dr SCGMC, Nanded for period of 18 months from January 2018-june 2019 to determine the histopathological findings in skin adnexal tumors.

Result- Total 22 cases were studied. The incidence of skin adnexal tumors is highest in sweat gland differentiation (45.45%), followed by hair follicle differentiation (22.72%), sebaceous differentiation (18.18%), site specific tumors (13.63%). In hair follicular differentiation tumors, we found only cases of pilomatricoma (5 cases), sebaceous carcinoma in sebaceous gland tumors(4 cases), and peget's disease in site specific tumors(2 cases). Among the sweat gland tumors spiradenoma is most common (23.07%), followed by cylendroma, eccrine syringofibroadenoma, peget's disease (15.4% each), then syringocystadenoma papilleferum, syringoma, hydrocystoma, hidradenoma papilleferum (7.69% each). The most common presenting complaint of adnexal skin tumors is Nodular mass (68.18%), followed by fungating, ulcerative and papule (9.1% each).

Conclusion- In our study overall occurrence of skin tumors is more on sun exposed areas like head and neck , upper and lower extremities. The incidence of malignancy is more in higher age group than the benign tumors which are more common in younger population.

Key Word- skin adnexal tumor, benign, malignant.

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I. Introduction

The skin is the largest organ in the body, both in weight and surface area.¹ The skin provides mechanical protection to underlying tissues. In this connection it is thickest over areas exposed to greatest friction.² The skin or integument is a complex organ with many functions and with three main anatomic components: epidermis and skin adnexa, melanocytic system, and dermis and subcutis.¹

Hairs are present on the skin covering almost the whole body. The sites where they are not present include palms, soles, ventral surface and sides of digits and some parts of genitalia.² Hair is different morphologically and biologically on different parts of the body. The different types of hair include lanugo, vellus and terminal hairs.

Appendageal tumors:

Adnexal tumours of skin, though rare, have been recognised from latter part of 19th century. The first case of a mixed tumour of skin was reported by Nasse.³ Historically, tumors of the epidermal appendages have been classified into four groups that exhibit histologic features analogous to hair follicles, sebaceous glands, apocrine glands, and eccrine glands, according to a gradient of decreasing differentiation.⁴ Adnexal tumours may display more than one line of differentiation, rendering precise classification more difficult.⁵

Histogenesis of adnexal tumors (Cell of origin)

Histogenesis is a concept that implies that the histologic appearance of a tumor is similar to the histology of the organ/structure from which the tumor arose.⁴

Histochemical and electron microscopic investigations have been useful in the determination of histogenesis of many appendage tumors. The immature cells of appendage tumors, like immature cells of cutaneous appendages of human embryo, contain certain enzymes that are specific for each cutaneous appendage. The electron microscopic examination of the appendage tumors reveals details which are not recognizable on examination with light microscope.⁶

In 1948, the thesis was advanced that cutaneous tumors differentiating toward hair, sebaceous glands, or apocrine glands developed from primary epithelial germ cells. The hyperplasias, adenomas, and benign epitheliomas arose from primary epithelial germ cells that had attained a certain degree of differentiation before the onset of neoplasia. The stem cells are continually present in the skin and it is likely that the appendageal tumors arise from these cells.⁴

II. Materials And Methods

The present study was carried out in the department of Pathology, during period of 1st January 2018 to 30th June 2019.

SOURCE OF DATA: All the biopsies, specimens and reference materials submitted to the tertiary care centre for histopathological study during the period from 1st January 2018 to 30th June 2019.

STUDY DESIGN: Prospective study.

STUDY POPULATION: Patients came in OPD and admitted under Department of Surgery with skin tumors.

SAMPLE SIZE: Samples obtained during the period of 1/1/2018 to 30/06/2019

STUDY DURATION: 18 months

INCLUSION CRITERIA:

All benign and malignant tumors of skin adnexa were included.

EXCLUSION CRITERIA:

- 1) All non- neoplastic lesions and tumor like lesions of skin were excluded.
- 2) All tumors and tumor like lesion of skin of genitalia were excluded.

METHODS OF COLLECTION OF DATA:

Clinical data is obtained from hospital records and tissue specimens received in the department. Nature of specimen was noted. Specimens were fixed in 10% formalin for 12-36 hours and the gross features were examined. Extent of sampling depended on the size of tumor as follows.

1. Specimens measuring 3 mm or less were submitted in toto.
2. Specimens measuring 4-6 mm were cut through the center and both halves submitted for processing.
3. Specimens measuring 7 mm or more, a 2-3 mm slice from center was cut and submitted for processing.
4. For larger malignant lesions, 2-4 sections from tumor and 4 or more sections from surgical margins were taken.

Further, tissue was processed and embedded in paraffin blocks. Sections of 3 to 5 micron thickness were taken and stained with hematoxylin and eosin and studied.

Staining procedure for haematoxylin and eosin stain

1. Deparaffinize the section in xylene.
2. Keep in xylene – two changes 15 minutes each.
3. Keep in absolute alcohol – 1 minute.
4. Keep in 95% alcohol – 1 minute.
5. Keep in 75% alcohol – 1 minute.
6. Keep in 95% alcohol – 1 minute.
7. Wash with distilled water
8. Keep in hematoxylin solution –20 minutes.
9. Wash and keep in water for blueing – 5 minutes.
10. Differentiate in 1% acid alcohol for 5 – 10 seconds.
11. Wash well in running tap water (10-15 minutes).
12. Stain with 1% eosin for 1 minute.
13. Wash with distilled water.
14. Clean the slides with gauze piece.
15. Dehydrate through ascending grades of alcohol.
16. Clear in xylene.
17. Mount with DPX (dextrin polystyrene xylene) & label the slides.

Results of staining:

- Nuclei – blue black.
- Cytoplasm – different shades of pink. Red blood cells – orange / red.
- Fibrin – deep pink.
- Serous secretion – Pink.
- Mucinous secretion - Blue.

III. Results And Observations

Adnexal tumors

Total 22 cases found of skin adnexal tumours out of which 16(72.7%) are benign tumours and 6(27.2%) are malignant tumors.

Table No 1: Incidence of benign and malignant skin adnexal tumours according to differentiation.

| Sr. No. | | Number of benign tumors | Number of malignant tumors | Total number of tumors |
|---------|-------------------------------|-------------------------|----------------------------|------------------------|
| 1 | Hair follicle differentiation | 5(31.25%) | 0 | 5(22.72%) |
| 2 | Sweat gland Differentiation | 11(68.75%) | 0 | 11(50%) |
| 3 | Sebaceous differentiation | 0 | 4(66.66%) | 4(18.18%) |
| 4 | Site specific tumors | - | 2(33.33%) | 2(9.1%) |
| | Total No of cases | 16(72.72%) | 6(27.27%) | 22(100%) |

The incidence of skin adnexal tumors is highest in sweat gland differentiation 11 (50%), followed by hair follicle differentiation 5 (22.72%), sebaceous differentiation 4 (18.18%), site specific tumors 2 (9.1%). In hair follicular differentiation tumors, we found only cases of pilomatricoma (5 cases), sebaceous carcinoma in sebaceous gland tumors (4 cases), and paget disease in site specific tumors(2 cases).

Graph No 1: Incidence of skin appendageal tumours.

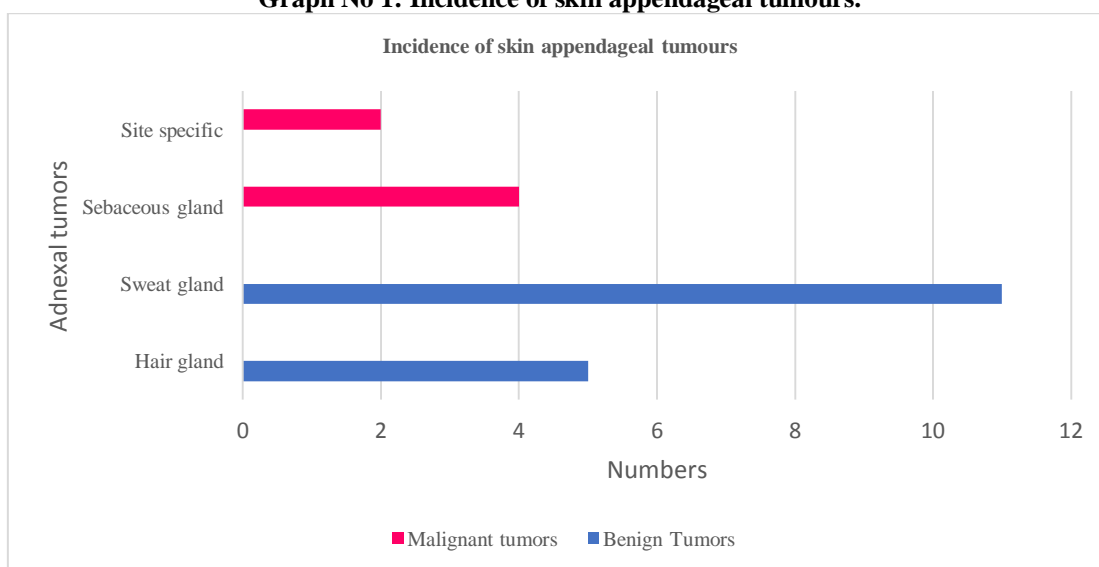


Table No 2: Distribution of sweat gland tumours

| Sr. No. | Tumor of Sweat gland Differentiation | Total Number of Case | Percentage |
|---------|--------------------------------------|----------------------|------------|
| 1 | Syringocystadenoma Papilliferum | 2 | 18.18% |
| 2 | Eccrine spiradenoma | 3 | 27.27% |
| 3 | Cylindroma | 2 | 18.18% |
| 4 | Chondroid Syringoma | 1 | 9.09% |
| 5 | Eccrine Syringofibroadenoma | 2 | 18.18% |
| 6 | Eccrine Hydrocystoma | 1 | 9.1% |
| | Total | 11 | 100 |

Among the sweat gland tumors spiradenoma is most common(27.27%), followed by cylindroma, eccrine syringofibroadenoma and syringocystadenoma papilleferum (18.18% each) , then chondroid syringoma, hydrocystoma (9.1% each).

Ghraph No 2: Distribution of sweat gland tumours.

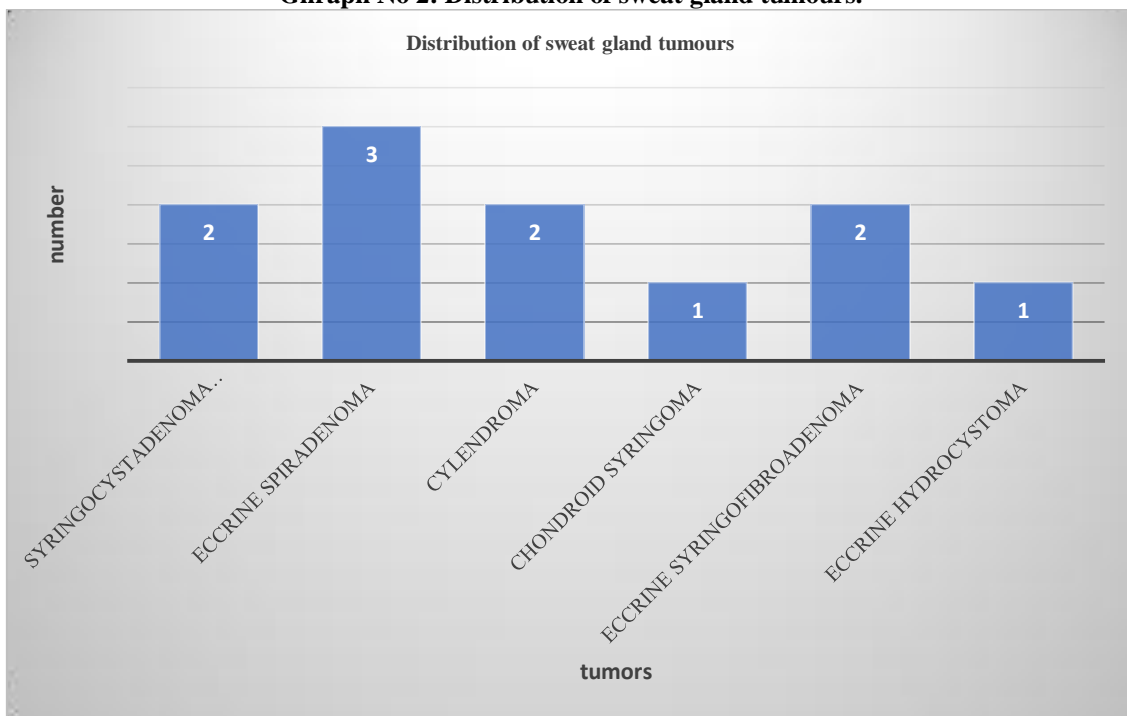


Table No 3: Age Incidence of benign and malignant Adnexal tumours of skin.

| Sr.No. | Adnexal Tumours | | 0-9 | 10-19 | 20-29 | 30-39 | 40-49 | 50-59 | 60-69 | 70-79 | Total |
|--------|------------------|---------------------------------|----------|----------|----------|----------|----------|----------|----------|----------|-----------|
| | | | | | | | | | | | |
| 1 | Benign | Chondroid Syringoma | - | - | - | - | - | - | - | 1 | 1 |
| | | Syringocystadenoma Papilliferum | - | 1 | 1 | - | - | - | - | - | 2 |
| | | Eccrine spiradenoma | - | - | 2 | - | 1 | - | - | - | 3 |
| | | Cylendroma | - | - | - | - | - | - | 2 | - | 2 |
| | | Pilomatricoma | - | 2 | 2 | - | 1 | - | - | - | 5 |
| | | Eccrine Syringofibroadenoma | 1 | - | - | - | 1 | - | - | - | 2 |
| | | Eccrine Hydrocystoma | - | - | - | - | - | - | - | 1 | 1 |
| | | Total | 1 | 3 | 5 | - | 3 | | 2 | 2 | 16 |
| 2 | Malignant tumors | Sebaceous Carcinoma | - | - | - | - | 1 | 1 | 1 | 1 | 4 |
| | | Paget Disease | - | - | - | 1 | - | - | 1 | - | 2 |
| | | Total | | | | 1 | 1 | 1 | 2 | 1 | 6 |

In present study the benign adnexal tumors are more common in young adult and in malignant tumors it more common in old age group. The most common age group for benign adnexal tumors is 20-29 years (5 cases), and in malignant adnexal tumors is 60-69 years (2 cases).

Graph No 3: Age Incidence of benign and malignant Adnexal tumours of skin.

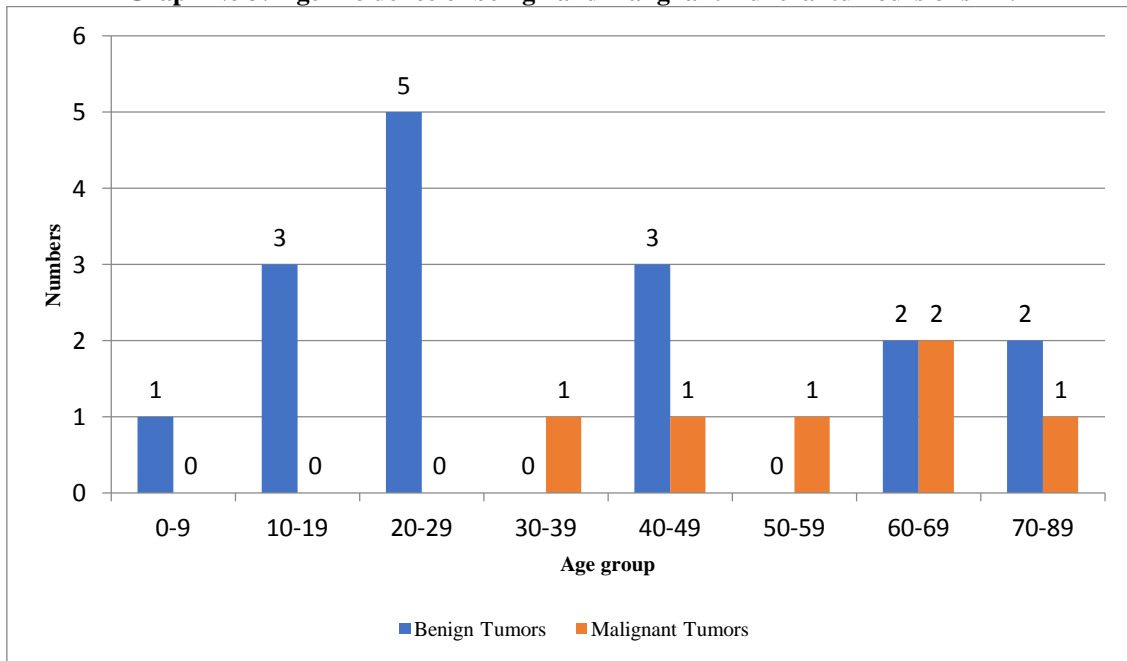


Table No 4: Sex Incidence of skin appendageal tumours

| Sr. No. | Tumors | No.of cases in male | No.of cases in female | Total No. of cases | |
|---------|----------------------|---------------------------------|-----------------------|--------------------|----------|
| 1 | Hair follicle tumors | | | | |
| | | Pilomatricoma | 1 | 4 | 5 |
| 2 | Sweat gland | Syringocystadenoma Papilliferum | 2 | - | 2 |
| | | Eccrine spiradenoma | - | 3 | 3 |
| | | Cylindroma | - | 2 | 2 |
| | | Chondroid Syringoma | 1 | - | 1 |
| | | Eccrine Syringofibroadenoma | 1 | 1 | 2 |
| | | Eccrine Hydrocystoma | 1 | - | 1 |
| 3 | Sebaceous gland | Sebaceous Carcinoma | 2 | 2 | 4 |
| 4 | Site specific Tumors | Paget Disease | - | 2 | 2 |
| | Total | | 8(36%) | 14(64%) | 22(100%) |

There is female predominance than male in total cases with ratio of male : female is 1:1.75. The incidence of pilomatricoma and tumors of sweat gland is more in female than male, with ratio of male to female is 1:4 and 1:1.2 respectively. There is equal distribution of cases in male and female in sebaceous carcinoma our study.

Graph No 4: Sex Incidence of skin adnexal tumours.

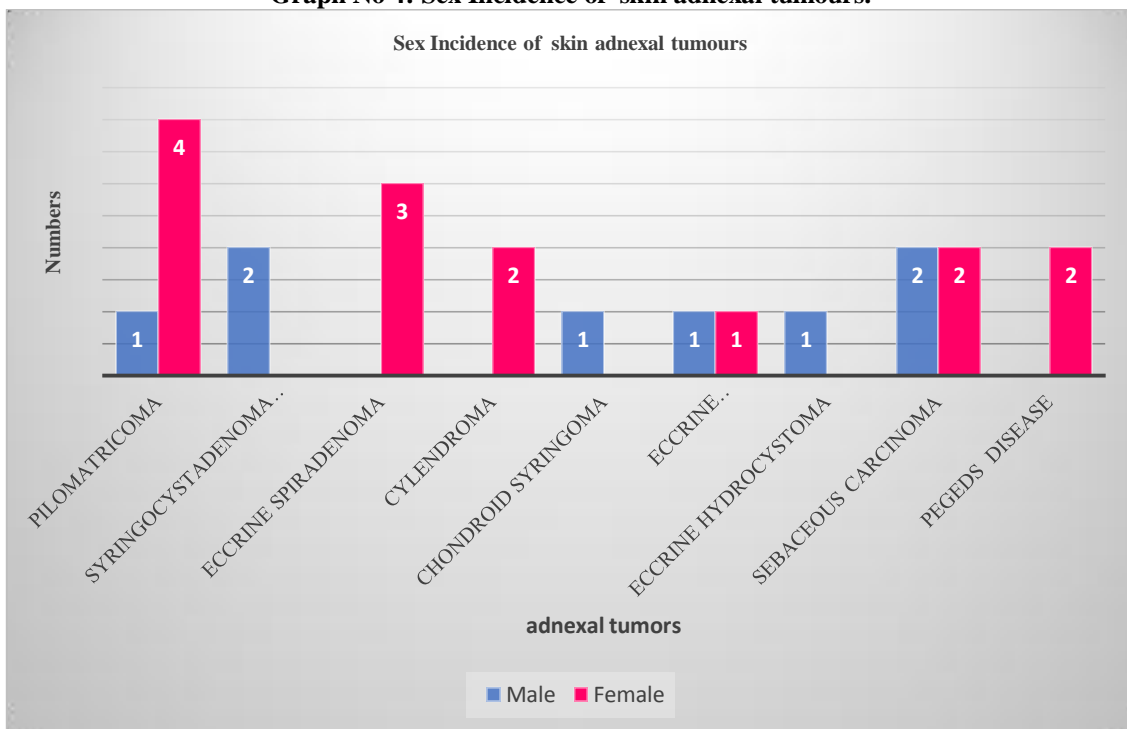


Table No 5 : Site distribution of adnexal tumours.

| Sr. | Site | Number | Percentage | |
|-----|-------------------|----------------|------------|--------|
| 1 | Head and Neck | Eyelid | 7 | 31.81% |
| | | Forehead | 2 | 9.09% |
| | | Chin | 1 | 4.54% |
| 2 | Trunk | abdominal wall | 1 | 4.54% |
| | | Back | 1 | 4.54% |
| 3 | Upper extremities | Arm | 1 | 4.54% |
| | | Hand | 1 | 4.54% |
| 4 | Lower extremities | Thigh | 3 | 13.63% |
| | | Leg | 2 | 9.09% |
| | | Foot | 1 | 4.54% |
| | | NAC | 2 | 9.09% |
| | Total | 22 | 100% | |

In present study, the most common site for adnexal tumours is head and neck 10 (45.44%), followed by lower extremities 6 (9.08%), trunk 2 (9.08%), upper extremities 2 (9.08%), NAC 2 (9.08%).

Graph No 5 : Site distribution of adnexal tumors.

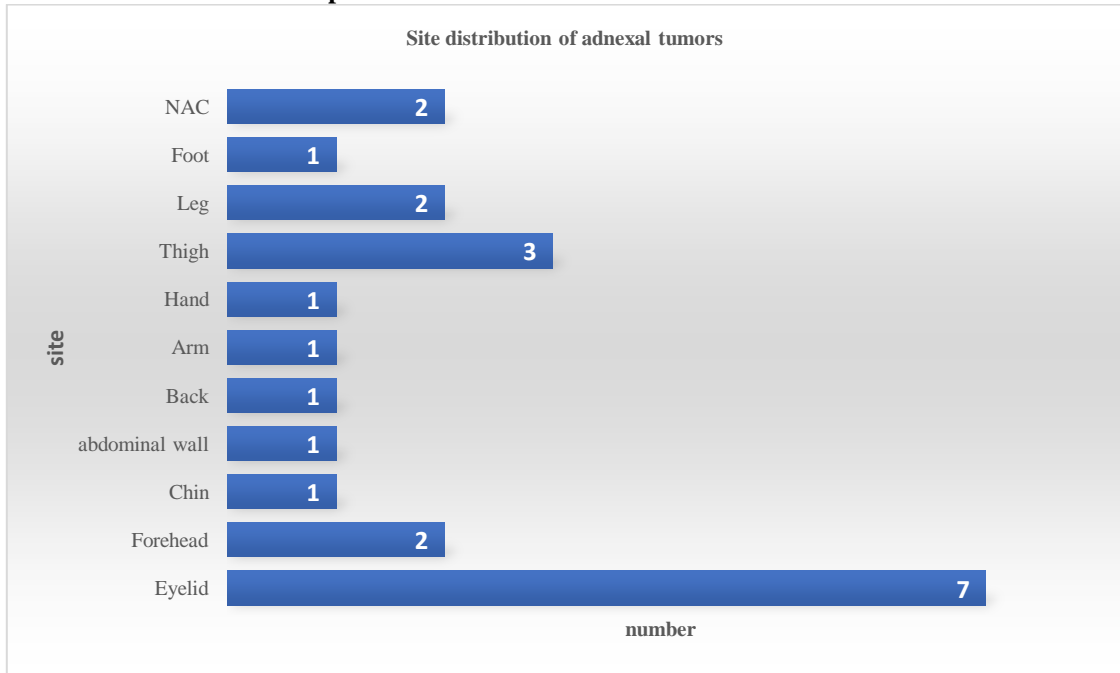
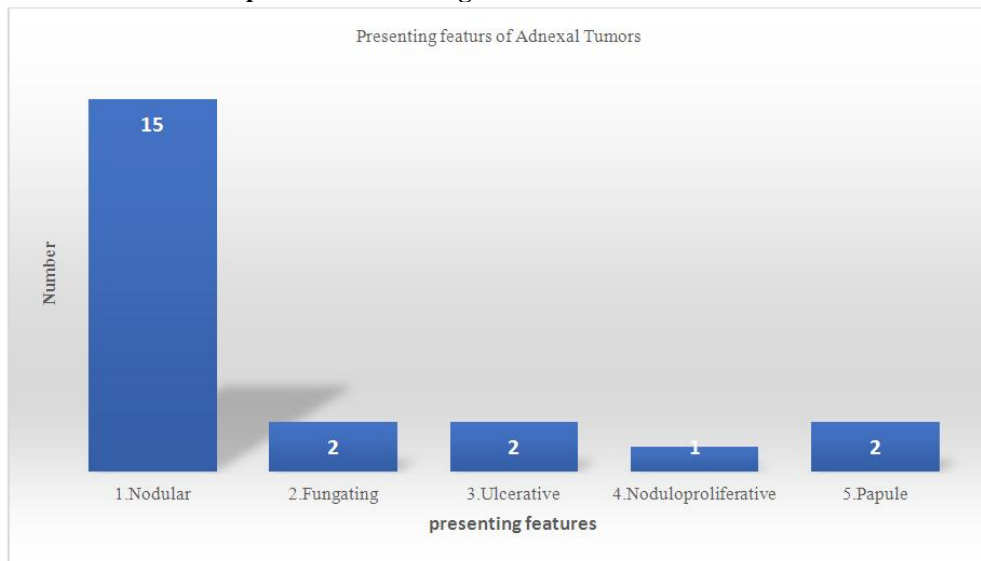


Table No 6: Presenting features of Adnexal Tumors

| Sr.No. | Presenting complaints | Number | Percentage |
|--------|-----------------------|--------|------------|
| 1 | Nodular | 15 | 68.18% |
| 2 | Fungating | 2 | 9.1% |
| 3 | Ulcerative | 2 | 9.1% |
| 4 | Noduloproliferative | 1 | 4.54% |
| 5 | Papule | 2 | 9.1% |
| | Total | 22 | 100% |

The most common presenting complaint of adnexal skin tumors is Nodular mass 15 (68.18%), followed by fungating, ulcerative and papule 2 (9.1% each).

Graph No 6: Presenting features of Adnexal Tumors



IV. Discussion

Adnexal Tumors

Table No 7: Comparison of incidence of adnexal tumours

| Sr. No. | Authors | Benign | | Malignant | | Total No of cases |
|---------|---|--------|--------|-----------|--------|-------------------|
| | | No | % | No. | % | |
| 1 | Reddy ³ et al | 59 | 69.4% | 26 | 30.6% | 85 |
| 2 | Vijayan P ¹¹ et al | 43 | 71% | 17 | 29% | 60 |
| 3 | Kaur K ¹⁴ et al | 91 | 82.7% | 19 | 17.27% | 110 |
| 4 | Shilpa V.,Uplaonkar ¹³ et al | 14 | 77.7% | 42 | 2.2% | 48 |
| 5 | SHRIVASTAVA ¹⁵ et al | 42 | 77.7% | 12 | 22.2% | 31 |
| 6 | Present study | 16 | 72.72% | 6 | 27.28% | 22 |

The present study shows benign (72.72%) more than malignant (21.28%) tumors, which is consistent with all other studies range from 82.73% of benign and 17.27% malignant tumors (Kaur K¹⁴ et al) to 69.4 % benign and 30.6% malignant tumors (Reddy³ et al).

Table No 8: Comparison of sex incidence of skin adnexal tumors

| Sr.No. | Auther | Male:Female |
|--------|----------------------------------|-------------|
| 1 | Nair S ⁸ et al | 1:2.3 |
| 2 | Ankit sharma ¹⁰ et al | 10.7:1 |
| 3 | Sameer MA ¹² et al | 1:2.89 |
| 4 | Present study | 1:1.75 |

The present study shows female predominance in adnexal skin tumors (M:F =1:1.76), which is consistent with study done by Sameer MA¹² et al and Nair S⁸ et al , which shows M:F ratio 1:1.289 and 1:1.23 respectively.

Table No 9: Comparison of incidence of benign adnexal tumours

| Sr. No. | Tumors | Solanki RL ⁷ et al | Nair PS ⁸ et al | Radhika ⁹ et al | Ankit sharma ¹⁰ et al | Shilpa V., Uplaonkar ¹³ et al | Present study |
|---------|------------------------|-------------------------------|----------------------------|----------------------------|----------------------------------|--|----------------|
| 1 | Hair Follicle tumors | 22 (23.4%) | 12 (36.36%) | 5 (23.4%) | 20 (35.71%) | 4 (28.5%) | 5 (31.25%) |
| 2 | Sweat gland tumors | 50 (53.2%) | 19 (57.56%) | 13 (53.2%) | 24 (42.86%) | 10 (71.42%) | 11 (68.75%) |
| 3 | Sebaceous gland tumors | 22 (23.4%) | 2 (6.06%) | 5 (23.4%) | 12 (21.43%) | - | - |

The present study shows benign sweat gland tumors(68.75%) most common followed by benign hair follicular tumors (31.25%) of benign tumours of epidermal appendages. All other studies shows similar results with sweat gland tumors is most common ranging from 42.86% (Ankit sharma¹⁰ et al) to 71.42% (Shilpa V uplaonkar¹³ et al). incidence of benign hair follicular tumors in other studies range from 23.4% (Solanki RL⁷ et al) to 36.36% (Nair PS⁸ et al).

Table No 10: Comparison of incidence of different malignant adnexal tumors by their differentiation.

| Sr. No. | Malignant adnexal tumors | Reddy ³ et al | | Vijayan P ¹¹ et al | | Present study | |
|---------|--|--------------------------|-------|-------------------------------|--------|---------------|--------|
| | | No | % | No | % | No | % |
| 1 | Hair follicle | - | - | 5 | 29% | - | - |
| 2 | Sweat gland | 11 | 42.3% | 10 | 58% | - | - |
| 3 | Sebaceous | 15 | 57.7% | 2 | 12% | 4 | 66.66% |
| 4 | Site specific Tumors (Paget's disease) | - | - | 4 | 23.52% | 2 | 33.34% |
| | Total | 26 | 100% | | | 6 | 100 |

In the present study sebaceous gland carcinoma was the most common type (66.66%) followed by paget's disease (33.34%) .

In the study by Reddy³ et al sebaceous carcinoma was the most common type (57.7%) followed by sweat gland carcinoma (42.3%). In the study by Vijayan P¹¹ et al sweat gland carcinoma (58%) was most common , followed by hair follicle carcinoma (29%), paget's disease (23.52%), sebaceous gland carcinoma (12%).

Table No 11: Comparison of incidence of tumors of hair follicle.

| Sr.No. | Authors | Reddy ³ et al | Solanki RL ⁷ Et al | Present study |
|--------|-------------------|--------------------------|-------------------------------|---------------|
| 1 | Pilomatricoma | 9(69%) | 15(68.18%) | 5(100%) |
| 2 | Trichoepithelioma | 4(31%) | 5(22.72%) | - |
| 3 | Trichilemmoma | - | 2(9.09%) | - |
| | Total | 13 | 22 | 5 |

In present study, among hair follicle tumors we found 5 cases of pilomatricoma which is 100% of total hair follicle tumors. in studies done by Reddy³ et al and Solanki RL⁷ et al, pilomatricoma was the most common hair follicular tumor , that is 69% and 68.18% respectively.

Table No 12: Comparison of incidence of benign tumours of sweat gland

| Sr.No. | Tumours | Reddy ³ et al | Solanki RL ⁷ et al | Nair SP ⁸ et al | Present study |
|--------|---------------------------------|--------------------------|-------------------------------|----------------------------|---------------|
| 1 | Cylindroma | 1 (2.3%) | 3 (6.4%) | 1 (5.3%) | 2 (18.18%) |
| 2 | hidrocystoma | - | - | - | 1 (9.09%) |
| 3 | Syringoma | 3 (7%) | - | 14(73.7%) | 1 (9.10%) |
| 4 | Spiradenoma | 2 (4.6%) | 5 (10.6%) | 2(10.5) | 3 (27.27%) |
| 5 | Syringocystadenoma papilliferum | 3 (7%) | 11 (23.4%) | 1(5.3%) | 2 (18.18%) |
| 6 | Eccrine Syringofibroadenoma | - | - | - | 2 (18.18%) |
| 7 | Chondroid syringoma | 11 (23.4%) | 2 (4.6%) | - | - |
| 8 | Hidradenoma | 29 | 13 | 1 | - |

| | | (67.4%) | (27.6%) | (5.3%) | |
|----|--------------------------|------------|-------------|--------|----|
| 9 | Hidradenoma papilliferum | - | 2 (4.3%) | - | - |
| 10 | Eccrine poroma | - | 2 (4.3%) | - | - |
| 11 | Unclassified | 39 (7%) | - | - | - |
| | Total No of cases | 43 | 47 | 19 | 11 |

In the present study the most common cases were of spiradenoma (27.27%), followed by syringocystadenoma papilliferum, syringofibroadenoma, and cylendroma (18.18% each), hidrocystoma, syringoma (9.1% each).

In the study by Reddy³ et al hidradenoma(67.4%) was the most common tumour.

In the study by Solanki RL⁷ et al hidradenoma (27.6%) was the most common followed by 23.4% each of chondroid syringoma and syringocystadenoma papilliferum.

In the study by Nair SP⁸ et al syringoma (73.7%) was the most common tumour.

V. Conclusion

In our study overall occurrence of skin adnexal tumors is more on sun exposed areas like head and neck , trunk and lower extremities. This may be due to the exposure of skin to the UV rays leading to the occurrence of skin adnexal tumors more on sun exposed areas. The incidence of malignancy is more in higher age group than the benign tumors which are more common in younger population. 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.

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