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Original Article

Incidence and Morphological Variations of Skin Tumors in Benghazi

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ABSTRACT

Skin is the largest, most complicated organ in the body and it covers the body's entire external surface, that's why skin diseases are one of the most difficult ailments to adjust to because of its ugliness and related problems. 10-20% of patients seeking medical guidance have skin diseases or complaints, skin conditions are prevalent across all parts of the world. The objective of this study is to evaluate the incidence of different skin histopathological benign tumors and their variations according to age, sex, clinical presentation, and site, and make comparisons with other studies. This retrospective study was conducted from January 2018 until February 2020, and this study included all cases with histological diagnosis of various skin tumors. Approval to handle all specimens for scientific research has been assured by the high graduate and university ethics committee. Out of 124 cases, the prevalence of benign tumors was the most common skin disease (79.83%), while malignant skin tumors were the least common skin diseases in this study (20.16%). However, the peak age group in benign skin tumors is 41-60 years, and in malignant skin tumors peak age is 61-80 years. We concluded that there was a significant relation between age, gender, clinical presentation, and site with different types of skin tumors, so histopathology is the most valuable means of diagnosis of skin diseases and a good guide for proper management.

Key Words: Skin, tumors, histology, histopathology, morphology.

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INTRUDUCTION

The skin is the largest organ in the body, both in weight and surface area. The weight of the skin in an average adult male is 4 kilograms (15-16% of total body weight) and it has a surface area of 1.5 - 2 m^2.

There are probably at least 2000 different skin conditions that might present to the dermatologist, and most dermatologists treat patients of all ages, from the neonate to the very old. Once the component of the skin is affected by a

pathologic process, it is determined to the extent possible by clinical examination, the lesion or lesions should be assessed in terms of their type, shape, arrangement, and distribution.

Tests must be done to confirm the diagnosis. The most common investigations performed in a dermatology clinic, other than simple blood tests or swabs for microbiology, are skin biopsies, they are the most confirming. The microscopic examination of skin tissue is probably the single most important diagnostic ancillary technique used by dermatologists.

The specific aims of this research were to identify the most common skin tumors diagnosed by histopathology, study the histomorphology of different skin biopsies, and finding out the incidence of different skin tumors and their variations according to age, sex, site, and clinical presentation.

MATERIALS AND METHODS

The study was conducted in the laboratory of the private sector, (El Noon) and (Tiba), City of Benghazi – Libya. The study period was from January 2018 to December 2019 and information regarding skin specimens was retrospectively gathered from archives of histopathology laboratories. The study was funded by the University of Benghazi, faculty of Medicine for the purpose of scientific research. A careful consideration regarding patient's privacy and confidentiality of their data have been assured by high graduate and university ethics committee. A total number of 124 biopsy samples were fixed in 10% neutral buffered formalin and usual paraffin processed. Three to five micron sections were cut and finally stained by Hematoxylin and Eosin (H & E).

Demographic data were examined regarding the type of samples, Benign tumors and malignant tumors, age, sex, site and clinical presentation. Data analyzed with the next considerations: incidence of sample, age, sex, site and clinical presentation of the lesion, histological finding, pathological pattern and final diagnosis.

The slides were examined under light microscope, various histopathological variations were studied in all samples and were arranged concerning age, sex, following histopathologic assessment.

Statistical analysis: The whole data were evaluated statistically by using the SPSS statistical package version 21 (Chi-square test). Independent t-test was used to correlate the mean age between the patients and the lesions. P – value less than 0.05 was considered as statistically significant. Microsoft word and Excel have been applied to make tables, graphs, pie diagrams, etc.

The histological and clinical data so received were evaluated. A comparison with other similar studies was done.

RESULTS OF THE STUDY

In this study out of 124 cases of tumor skin diseases, benign skin tumors were detected in 99(55%) cases and about 25(13.9%) of the cases were malignant skin tumors. Benign to malignant ratio is 3.96:1

Table1 : Distribution of patients with Benign tumor according to age groups (n=99).

Age groups	Number	%
Less than 20	8	8.1
20-40	36	36.4
41-60	43	43.4
61-80	9	9.1
More than 80	3	3.0
Total	99	100

Descriptive Statistics of Benign tumor (n=99):

Mean age = 43.24years Min=2years Max = 88 years SD =17.61 years

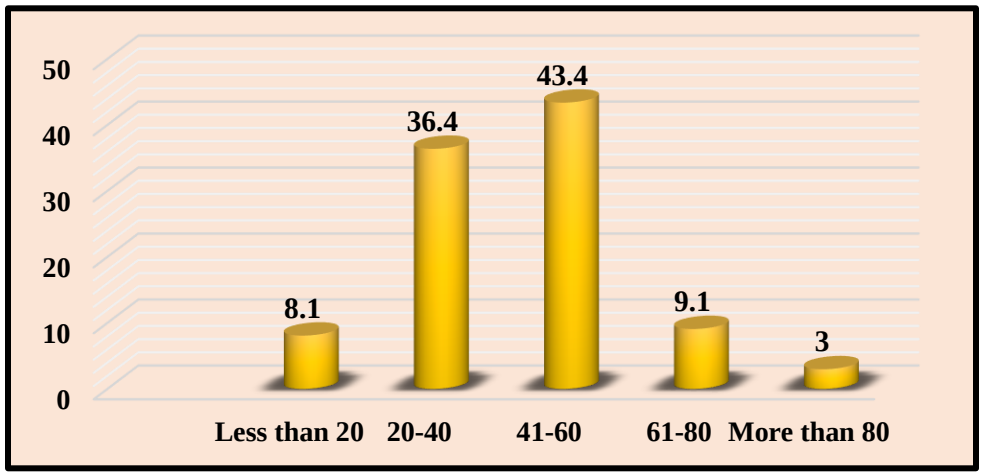

Figure 1: Distribution of patients with benign tumor according to age groups**.**

Table 2: Age distribution of benign tumor according to Classification (n=99).

Sex	Classification			
	Benign keratinocytic tumor	**Benign soft tissue tumor**	**Benign adnexal**	**Benign Melanocytic tumor**
Female	4(80%)	32(45.1%)	8(50%)	5(71.4%)
Male	1(20%)	39(54.9%)	8(50%)	2(28.6%)
Total	5 (100%)	71(100%)	16(100%)	7(100%)

Table 3: Sex distribution of benign tumor according to Classification (n=99).

Age groups	Classification			
	Benign keratinocytic tumor	**Benign soft tissue tumor**	**Benign adnexal**	**Benign Melanocytic tumor**
Less than 20	0 (0%)	6 (8.5%)	1 (6.3%)	1 (14.3%)
20-40	2 (40%)	25 (35.2%)	5 (31.3%)	4 (57.1%)
41-60	2 (40%)	34 (47.9%)	5 (31.3%)	2 (28.6%)
61-80	1 (20%)	5 (7%)	3 (18.8%)	0 (0%)
More than 80	0 (0%)	1 (1.4%)	2 (12.5%)	0 (0%)
Total	5 (100%)	71 (100%)	16 (100%)	7 (100%)

X^2= 3.76 P value=0.288 (NOT Significant)

Table 4: Distribution of Benign and Malignant tumors according to classification (n=124)

Type	Benign tumors (n= 99)		Malignant tumors (n=25)	
Keratinocytic tumors	**No (%)**		**No (%)**	
	Verruca vulgaris	3(60%)	Squamous cell carcinoma	11(50)
	Verroucus epidermal nevus	2(40%)	Basal cell carcinoma	10(45.4%)
			Pseudo-epitheliomatous changes	1 (4.5%)
Total		**5(5.1%)**		**22 (88%)**
Melanocytic tumors				
	Melanocytic nevus	6(85.7%)	-	-
	Spitz nevus	1(14.2%)	-	-
Total		**7 (7.1%)**	**-**	**-**
Adnexal tumors				
	Keratinous cyst	11(68.7%)	-	-
	Sebaceous cyst	5(31.25%)	-	-
Total		**16(16.2%)**		
Soft tissue tumors				
	Lipoma	40(56.3%)	Liposarcoma	**1(4%)**
	Skin tag	9(12.6%)	-	-
	Haemangioma	9(12.6%)	-	-
	Fibroma	7(9.85%)	-	-
	Benign fibrous histocytoma	3(4.2%)	-	-
	Lipofibroma	2(2.8%)	-	-
	Pyogenic granuloma	1(1.4%)	-	-
Total		**71(71.7%)**		
Tumor of Haematopoietic and lymphoid origin	-		Mycosis fungoides	**2(8%)**
Grand total	**99(100%)**		**25(100%)**	

Table 5: Clinical presentation of benign tumor according to Classification (n=99).

Clinical presentation	Classification			
	Benign keratinocytic tumor	Benign soft tissue tumor	Benign adnexal	Benign Melanocytic tumor
Swelling	0(0.0%)	57(80.3%)	16(100%)	0(0.0%)
Polyp	0(0.0%)	9(12.7%)	0(0.0%)	0(0.0%)
Pigmentation	1(20.0%)	0(0.0%)	0(0.0%)	7(100.0%)
Hyperkeratosis	4(80.0%)	0(0.0%)	0(0.0%)	0(0.0%)
Other	0(.0%)	5(7.0%)	0(0.0%)	0(0.0%)
Total	5(100 %)	71(100%)	16(100%)	7(100%)

Table 6: Sites distribution of benign tumor according to Classification (n=99).

Sites	Classification			
	Benign keratinocytic tumor	Benign soft tissue tumor	Benign adnexal	Benign Melanocytic tumor
Chest	0(0.0%)	10(14.1%)	0(0.0%)	0(0.0%)
Back	1(20%)	15(21.1%)	7(43.8%)	0(0.0%)
Upper limb	0(0.0%)	23(32.4%)	5(31.3%)	0(0.0%)
Lower limb	4(80%)	9(12.7%)	3(18.8%)	0(0.0%)
Face	0(0.0%)	14(19.7%)	1(6.3%)	7(100%)
Total	5(100%)	71(100%)	16(100%)	7(100%)

Table 7: Distribution of patients with malignant tumor according to age groups (n=25).

Age groups	Number	%
Less than 20	1	4
20-40	2	8
41-60	6	24
61-80	14	56
More than 80	2	8
Total	25	100

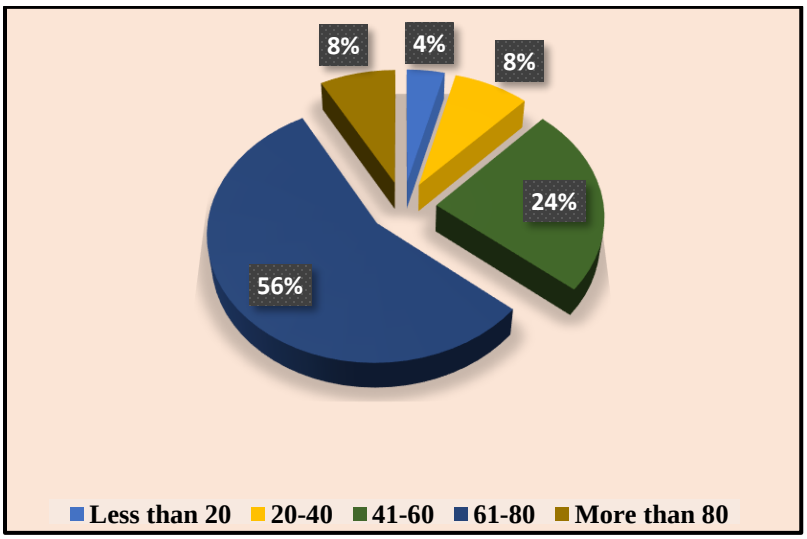

Figure 2: Distribution of patients with malignant tumor according to age groups (n=25).

Table 8: Distribution of patients with malignant tumor according to Sex (n=25):

Sex	Number	%
Female	6	24
Male	19	76
Total	25	100

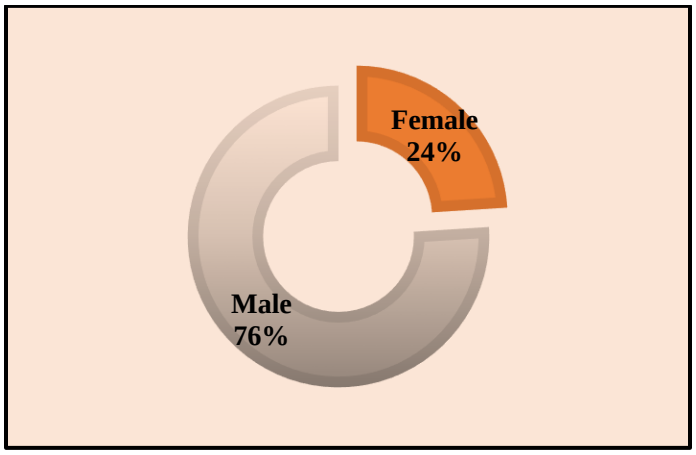

Figure 3: Distribution of patients with malignant tumor according to Sex (n=25):

Table 9: Age distribution of malignant tumor according to Classification (n=25):

Age group	Classification			Total
	Malignant Keratinocytic tumor	Malignant soft tissue tumor	Tumor of haematopoietic and lymphoid origin	
Less than 20	0(0.0%)	1(100%)	0(0.0%)	1(4%)
20-40	2(9.1%)	0(0.0%)	0(0.0%)	2(8%)
41-60	6(27.3%)	0(0.0%)	0(0.0%)	6(24%)
61-80	12(54.5%)	0(0.0%)	2(100%)	14(56%)
More than 80	2(9.1%)	0(0.0%)	0(0.0%)	2(8%)
Total	22(100%)	1(100%)	2(100%)	25(100%)

X^2= 26.62 P value=.001 Highly Significant

Table 10 : Sex distribution of malignant tumor according to Classification (n=25):

Sex	Classification			Total
	Malignant Keratinocytic tumor	Malignant soft tissue tumor	Tumor of haematopoietic and lymphoid origin	
Female	5(22.7%)	1(100%)	0(0.0%)	6(24%)
Male	17(77.3%)	0(0.0%)	2(100%)	19(76%)
Total	22(100%)	1(100%)	2(100%)	25(100%)

Table 15: Clinical presentation of malignant tumor (n=25):

Clinical presentation	Classification			Total
	Malignant Keratiocytic tumor	Malignant soft tissue tumor	Tumor of haematopoietic and lymphoid origin	
Swelling	1(4.5%)	1(100%)	0(0.0%)	2(8%)
Ulcer	19(86.4%)	0(0.0%)	0(0.0%)	19(76%)
Hyperkeratosis	1(4.5%)	0(0.0%)	0(0.0%)	1(4%)
Other	1(4.5%)	0(0.0%)	2(100%)	3(12%)
Total	22(100%)	1(100%)	2(100%)	25(100%)

X^2= 27.84 P value= .000 Highly significant

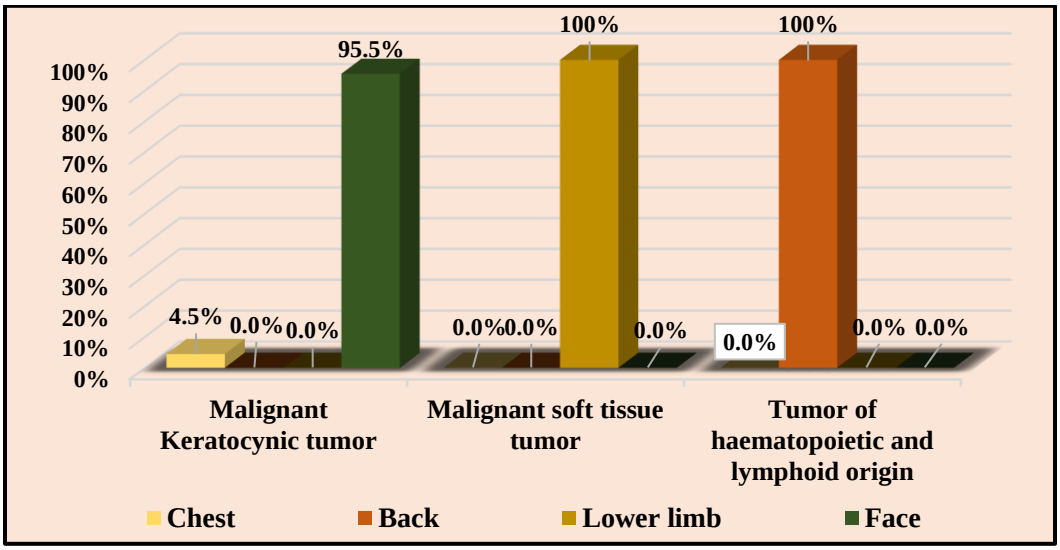

Figure 4 : Site distribution of malignant tumor according to classification (n=25).

DISCUSSION

In the current study, out of 124 skin biopsies received during the study period of two years 99 cases were benign tumors, while 25 cases were malignant tumors.

The incidence of benign tumors was higher as compared to malignant ones. Benign: malignant ratio 3.96:1. The current study in agreement with (Sharma A. et al., 2014)(1) who observed that incidence of benign tumors is more as compared to malignant tumors were benign (80.36%) and malignant tumors were (19.64%), also seen in studies by (Reddy et al., 1964)(2) who reported (77.14.%) , (69.41%), were benign tumors, (29.63%), (30.59%) were malignant tumors respectively. All these results were consistence with this study. The study performed by (Kaur R. et al., 2016) (3) who also found that benign neoplasms were twice more common than malignant tumors, similar finding were noted in various studies performed by (Gundalli et al., 2014)(4), in their study from south India reported a preponderance of malignant tumors over benign tumors (39.84%) benign, (60.61%) malignant, as also was recorded by (Kapoor et al., 1993)(5) who found higher frequency of malignant skin tumors than benign tumors, these finding were in disagreement with the current study. This disparity in prevalence of benign and malignant

tumors could be attributed to geographical variation and different skin types of population.

According to the age group of benign tumors, the peak of benign tumors seen at 41-60 years (43.4%) followed by 20-40 years (36.4%). Mean age groups were noted at 43.24 years. (Sharma A. et al.,2013) observed that the commonest age group of benign tumors was at age 51-60 years, followed by 31-40 years which was consistent with the current study. However, (Narhire V. et al., 2016)(6) Observed that the commonest age group was 11-20 years and (Gundalli et al., 2014), (Bari V. et al., 2014)(7) reported the occurrence of benign tumors in the third decade. In the current study we noted that the frequency of benign tumors at 61-80 year more than that at age of 80 years, (9.1%), (3%) respectively, we can conclude that the frequency of benign tumors decreases with increasing age.

The current study showed both benign and malignant tumors were more common in males than females, (50.5%) of benign tumors and (76%) of malignant tumors were seen in males, whereas (49.5%) of benign tumors and (24%) of malignant tumors were seen in females. Similar finding observed by (Karki, D. et al.,2018)(8) who found that both benign and malignant tumors were more common in male than female.

In the current study soft tissue tumors were most common benign tumor (71.7%), followed by adnexal tumors (16.2%) and melanocytic tumors (7.1%), keratinocytic tumors (5.1%) were the least.

A study done by (Sherpa, P. et al., 2018)(9) showed keratinocytic tumors were highest followed by soft tissue tumors, melanocytic and appendigeal tumors. However, in studies of (Dowerah, S. and Naiding, M. , 2018)(10) , reported that adnexal tumors were the most common group of benign tumors followed by soft tissue tumors, while the commonest benign tumor noted by (Narhire V. et al., 2016) was soft tissue tumor (32%), followed by appendageal tumors (28%) and this finding were in agreement with the current study.

In the study done by (Gundalli et al., 2014), commonest benign was appendageal tumors followed by melanocytic tumors. These variations in the incidence of benign tumors could be due to the difference in shape, size, duration of the study well as geographical and ethnic difference in susceptibility of the population.

The soft tissue tumors in the current study showed males more common than females (54.9%), (45.1%) respectively, (Duduyemi, B. and Kumar et al., 2015)(11) also reported that females were more than males in their study.

Duduyemi, B. explained the possible reason that female more common than male regarding incidence of soft tissue tumors, could be attributed to the fact that females are more readily accessible to health facilities for proper treatment of ailment than the males.

Soft tissue tumors are common in 41-60 years (47.9%), followed by 20-40 years (35.2%), whereas soft tissue tumors were rare after the age of 80 (1.4%), the study done by Duduyemi, B., who noted the commonest age group in 30-39 years (29.9%) followed by 40-44 years (20.2%).

Commonest site of soft tissue tumors was observed in the upper limbs (32.4%) followed by the back (21.1%). (Duduyemi, B. et al.,2019) observed that the commonest site for soft tissue tumors upper limbs, followed by lower limbs (50.7%) which agree with current study, while the second commonest site in his study was the head region (22.2%) were in disagreement with present study. However, majority of the lesions affected both extremities when combined compared with other sites, commonest clinical presentation of soft tissue tumors were swelling (80%) P. v = 0.000 showing highly significance.

In the current study common histomorphological type of soft tissue tumors were lipoma (56.3%), followed by skin tags, haemangioma (12.6%) each agree with (Duduyemi, B. et al., 2019) who also observed the most common benign tumor was lipoma which constitute about half of the cases.

The second commonest benign tumors were adnexal tumors (16.2%) males and females equally affected (50%) each. (Shrivastava, V., et al., 2019) (12) showed male predominance with M: F Ration 1.24:1 , which is comparable with study of (Schuman et al., 1973) (13) M:F Ration of 1.07:1 and (Bari V. et al and Narhire et al.,2014) observed that adnexal tumors showed female predominance.

The peak age group 41-60 years (31.1%), the back region was the most common site affected. (43.8%), followed by upper limbs (31.3%) and lower limbs (18.8%) this result agree with (Shrivastava, V., et al., 2019), who found that adnexal tumors can occur anywhere in the body, the swelling was the most common clinical presentation observed in current study

(Sharma A. etal et al., 2014) observed adnexal tumors in all age groups from 10-88 years, the highest incidence was observed in age group 51-60 years and M: F ratio 1.07: 1 , this finding is in agreement with current study. The common histomorphological type of benign adnexal tumors were keratinous cyst (68.7%) followed by sebaceous cyst (31.25%) this result disagrees with the study done by (Sharma A. etal et al., 2014 and K. Radhika et al.,2014) who observed that sweat gland tumors were the common benign adnexal tumors.

The third common benign tumor were melanocytic tumors constitute (7.1%) seen commonly in age groups 20-40 years (57.1%) . A study done by (Gundalli et al., 2014) observed that melanocytic tumors coming second after appendageal tumors whereas (Sherpa P. and Shiva R., 2018), observed that melanocytic tumors were the third common benign tumors, similar finding to current study, benign melanocytic tumors more common in females than males (71.4%), (28.6%) respectively.

Common site was seen in the face (100%) which is consisting with (Dowerah, S. and Naiding, M., 2018)15 who observed that head and neck, face are common sites of melanocytic tumors, common clinical presentation was pigmentation, most common histomorphological types were melanocytic nevi (85.7%), followed by spitz nevus (14.2%) which agree with result noted by (Dowerah, S. and Naiding, M. , 2018) but disagree with (Sherpa, P. and Shiva R., 2018), who concluded compound nevi were the most common melanocytic nevi in his study.

Our data revealed that rarest benign tumors were benign keratinocytic tumors (5.1%), these observations disagree with many previous studies. (Bari. V. et al, Sherpa P.,et al.,2018) all those concluded that benign keratinocytic tumors was highest in frequency than other benign tumors.

In the current study we observed that two peak of age groups related to benign keratinocytic tumors, 20-40 years, 41-60 years (40%) each. Females more affected than males (80%). (20%) respectively.

Common histomorphological type were seen Verruca vulgaris (60%), were same results detected by previous studies. Lower limbs common site (80%), same result seen by (Bari. V. et al., 2014) who observed that Verruca vulgaris occur over extremities, hyperkeratosis were commonest clinical presentation of benign keratinocytic tumors.

In the current study out of 124 tumor cases, 25 cases (13.9%) were diagnosed as malignant tumors, ratio of benign to malignant tumors was 3.96:1

In the current study the incidence of benign tumors more than malignant tumors (55%), (13.9%) respectively, (Bari V.,et al., 2014) observed that benign tumors were slightly more common (51.2%) than malignant tumors (48.8%). Age ranged from less than 20 years to more than 80 years, mean age 62.60 years, were as youngest age was 14 years, oldest age was 97 years.

The common age group of malignant tumors 61-80 years (56%). The observation consisting with study done by (Shrivastava, V., et al., 2019) who concluded that malignant tumors were common as age increases, a similar observation has been previously reported by (Sherpa P., et al.,2018), who observed malignant tumors exhibit an ascending trend, this could be older people have longer exposure to the sun ultraviolet rays which have strong association with skin malignancies (Sherpa, P. and Shiva R., 2018) .These results supported by study done by (Bari V., et al., 2014) common age the seventh decade in malignant tumors.

In current study, as noted malignant tumors are more common in males than females (74%), (24%) respectively, this result agree with most of the previous studies, done by (Bahamdan KA and Morad NA, 1993)(14), (Heidari M and Najafi F, 2013) (15), (Azad et al., 2014)(16), all of them reported a male predominance in malignant skin tumors than females. In addition, our result also

consistent with a study done by (Bari V. 2014) who observed that both benign and malignant tumors of the skin were common in males than females. In the current study study we observed according to WHO classification, Keratinocytic malignant tumors as commonest type of malignant skin tumors (84%) followed by tumors of Haematopoietic and lymphoid origin (8%), and soft tissue malignant tumors (4%).

The common age group affected by malignant keratinocytic tumors were 61-80 years (54.5%), more common in males than females (77.3%), (22.7%) respectively and the most common histomorphological type of tumors were SCC (50.0%) followed by BCC (45.5%), these finding agree with (Bari V. 2014) who observed that SCC most common histomorphological type of malignant keratinocytic tumors (45.9%) followed by BCC (34.4%), similar finding noted by (Shrivastava, V., et al., 2019). However, (Karki, D. et al., 2018)(17) concluded that malignant keratinocytic tumors account 90% of all skin malignancies of which about 70% are BCC, followed by SCC, in a similar study by (Hajheydari, Z et al., 2006)(18) in Iran BCC (68.4%) exceeded SCC (23%), followed by melanoma (3.3%), these results disagree with present study.

Regarding site of malignant keratinocytic tumors, we observed that the face is the most common site (95,5%), Ulcer was the most clinical presentation (86.4%), these results consistent with most of the previous studies which concluded that head and neck are the common sites of involvement by SCC and BCC. The reason for this could be due to actinic exposure, this finding supports the fact that skin neoplasm are most common in areas of the body with maximum sun exposure (Sherpa, P. and Shiva R., 2018). Also (Dowerah, S. and Shrivastava, V., 2019) observed that the common site of SCC and BCC were head and neck followed by lower limbs. The second common malignant skin tumor noted tumors of Haematopoietic and lymphoid origin (8%), two male cases only were observed, age 61-80 years and the back was the common site of this tumor, mycosis fungoides was the common histomorphological type.

The third common malignant skin tumor was soft tissue tumor constitute (4%), observed in female patient of young age group, less than 20 years old, swelling was the clinical presentation and were located in the lower limbs. Liposarcoma was the histomorphological type of this tumor. No other types of malignant tumors were detected in the current study.

Many studies done in India by Bari, Gundalli, reported that malignant melanoma is the third common malignant tumor according to WHO classification, in spite of this, no case of malignant melanoma reported in current study.

CONCLUSION

we concluded that benign tumors were common skin diseases (79.8%), followed by malignant skin tumors (20.16%). Tumor skin diseases were common in

males. We observed that there were different variations in age distribution among benign and malignant tumors, we also observed rarest skin tumors in age group less than 20 years and more than 80 years. The peak age group among benign skin tumors were 41-60 years while in malignant skin tumors peak age group 61-80 years.

This study showed significant relation between age groups, clinical site and type of skin tumor, also found significant difference between female and male patients in the pattern of the skin disease.

We concluded that, commonest benign tumor observed lipoma, while squamous cell carcinoma commonest malignant tumor, the common site of benign tumor was seen on the back, while in the malignant tumors the face was commonly affected than any other area in the body, However, both benign skin tumors and malignant tumors have overlapping clinical presentation and sometimes pose a diagnosis difficulty on clinical ground alone. Histopathological examination is helpful to arrive to the correct diagnosis as well as early management.

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