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INCIDENCE, ESTIMATE AND PRESENTATION OF NONMELANOMA SKIN CANCER IN TERTIARY CARE HOSPITAL'S OF QUETTA BALOCHISTAN.

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Abstract:
Objectives: To estimate the incidence, frequency, risk factors including age, gender related differences, site, laterality and occupational hazards of nonmelanoma skin cancer (NMSC) include Squamous cell carcinoma (SCCs), Basal cell carcinomas (BCCs) and Basosquamous skin cancer (BSC) presenting in Tertiary care Hospitals of the Quetta, Baluchistan.

Patients and methods:
Design: A descriptive analytic cross-sectional study conducted in Pathology departments of Bolan Medical Complex Hospital, Sandeman Civil Provisional Hospital and Center of Nuclear and Atomic Radiation (CENAR) Hospital Quetta setup from 1st December 2019 to 30th November 2022, including all the surgically resected biopsy specimens of non-melanoma cutaneous malignancies received in the department. The history included the age, gender, site, laterality and occupation of

the patient's. Incidence rate with reference to age, gender, occupational hazards and types of non-melanoma skin cancers were calculated.
Results: A total of 273 samples of non-melanoma skin cancers were included in this study with male to female ratio of 1.2:1. SCC was the commonest malignancy (54.5%) followed by BCC (43.5%) and Basosquamous carcinoma (02%). Majority of the male patients were farmers (51%). Only 0.6% of the males were office workers. Face was the most commonly affected area for both SCC and BCC followed by neck and limbs.
Conclusion: The main aim of the study is to reduce the morbidity and mortality associated with these malignancies by the proper awareness regarding the disease and UV light protection, early detection, rapid diagnosis and prompt treatment.

Key words: Basal Cell Carcinoma (BCC), Basosquamous Carcinoma (BSC), Cutaneous Cancer (CC). Squamous Cell Carcinoma (SCC), Nonmelanoma Skin Cancer (NMSC), Ultraviolet light (UV)

Introduction:

Skin is the largest organ of the human body and grown person has about two square meters of it (1). Skin cancer is most common type of cancer in the world that affect both men and women of all skin colors. Cancer of all kind is surging, from total three newly diagnosed malignancies, skin cancer is the one (2).

Cutaneous malignancies are estimated to occur in 20-30% of all malignancies in Caucasians, 02-04% of all neoplasm in Orientals, and 01-02% of all cancers in Africans and Indians (3). The etiology is related to various factors including skin type, age, sun exposure and genetic predisposition etc. Risk factors include individuals with a fair or light complexion, a history of severe sunburn, poor tanning capacities, inherited disorders, and immune-compromised status etc. (3,4). Numerous multifaceted phenotypic, genotypic and ecological influences promote the pathogenesis of non-melanoma skin cancers (4).UV exposure is thought to be a key factor in causing the skin cancers(3). Skin cancers comprise a group of malignancies which include primary and metastatic tumors invading the skin and its appendages. The skin cancers can be classified into melanomas and non-melanoma skin cancers (5). Nonmelanoma skin cancers differ from the melanomas by a high incidence combined with a very low lethality (6). Nonmelanoma skin cancer predominantly comprises of keratinocyte skin cancer, with approximately 80% basal cell carcinoma (BCC) and around 20% squamous cell carcinoma (SCC), which initiate from keratinocytes (7). BCCs are more common than SCCs and are characteristically locally invasive tumors with almost no metastatic hazard, however SCCs are actually metastatic, aggressive and fatal tumors (8). BCC development is mainly the cause of an intensive UV exposure in childhood and adolescence, while SCC development is related to chronic, cumulative UV exposure over decades (9).
The prevalence of NMSCs shows a discrepancy, according to the strength of sun contact, in 2012, the estimated rates for BCC and SCC were 884 and 387 per 100,000 in Australian people, 20-50 per 100,000 populations in Central and Northern Europe. The frequency of SCCs is about 10 per 100,000 inhabitants in Central Europe, in sunshiny states, it rises to 30 (Southern United States). Worldwide, mortality from SCCs and BCCs do not have a huge effect on death ratio from cancers, for instance, age-related death rates for SCC are reported at around one per 100,000 individual per annum or fewer (10). The prognosis of SCC of the skin is 80% reappearance free at 05 years (10, 11).
Pakistan is a developing country which falls into the low-to medium reserve class by WHO classification. Skin cancer is not common in Pakistani population, probably due to color of skin (12). The conclusion of the contemporary study is not correspondence with the previous studies because of the geographical uniqueness of the region having arid weather, highness and sustained sun exposure especially in farmers with some environmental causes might cause the pathology (13).

The present study was undertaken to know the frequency of cutaneous malignancies presenting in major tertiary care hospitals of Baluchistan.

Material and methods:
The permission was taken from Ethical review committee of the institutes. After that, 3 years data retrieved from record of Pathology Department of Bolan Medical Complex Hospital, Sandeman Civil Provisional Hospital and Center of Nuclear and Atomic Radiation (CENAR) Hospital Quetta. All registered cases were studied and data was collected on specially designed Proforma.

Study Design:
This was descriptive analytic cross sectional study, conducted in Pathology departments of Bolan Medical Complex Hospital, Sandeman Civil Provisional Hospital and CENAR Hospital Quetta setup from 1st December, 2019 to 30th November, 2022.

Patient Characteristics:
The history of sunlight exposure and occupation was also noted. All biopsy samples of the patients suffering from cutaneous malignancies were histologically examined according to the standard principles. The detailed history was undertaken with assurance of patient's confidentiality. Data concerning the patient's age, gender, site, laterality, occupation of the patient and type of cancer was under taken, complications, any radio/chemotherapy were also noted.

Histopathologic Features:
Hematoxylin and eosin–stained sections from all patients were reviewed by histopathologist. Each case of NMSCs including SCCs, BCCs and basosquamous carcinoma was evaluated comprehensively.

Statistical Analysis
All eligible patient data and statistics were computed by using SPSS (Statistical Packages of social sciences) version 21 and frequency tabulation. The ethical committee approval was taken from all three tertiary care hospitals.

Results:
A total of 273 received samples of patient's with nonmelanoma skin cancers were included in this study. Majority of the patient's were males (55%) and female were 45% with male to female ratio was 1.2:1. The mean age recorded for NMSC was 47 years.
Squamous cell carcinoma was the commonest malignancy disclosed followed by Basal cell carcinoma. Out of 273 cases of nonmelanoma skin cancers 149 cases which was 54.5% of cases were of squamous cell carcinoma and 119 was basal cell carcinoma which is about 43.5% and 02% cases were of basosquamous skin cancer. Face (75%) was the most commonly affected site for squamous cell carcinoma. Neck, Upper and Lower limbs accounting for 05% each followed by Foot (04%), Hand (03%) and Trunk (02%). Face is the mostly affected site accounting for 94% of BCC cases followed by Neck 03% and Lower Limb 02% in majority of the patients.
Regarding the occupations of the study population, majority of the male patients were farmers (51%), labours 35%, hawkers 06% and security workers 05%. Only 0.6% of the males were office workers. Most of the female patients were housewives (97%) and only 02% were labours.

TABLE01: NONMELANOMATOUS SKIN CANCER ACCORDING TO HISTOPATHOLOGICAL SUB-TYPES. (N=273)

Type of cancers	Nonmelanoma Skin Cancer (NMSC)	Squamous Cell Carcinoma (SCC)	Basal Cell Carcinoma(BCC)	Basosquamous cell carcinoma
No of cases	**273**	149	119	05
Percentage	**100**	54.5%	43.5%	02%

TABLE 02: DISTRIBUTION OF NONMELANOMATOUS SKIN TUMORS ACCORDING TO GENDER AND MALE TO FEMALE RATIO. (N=273)

Gender	Nonmelanomatous skin tumors	Percentage %	M:F- Ratio
Male	149	54.5	**1.2: 1**
Female	124	45.5	
Total	**273**	**100**	

TABLE 03: SQUAMOUS CELL CARCINOMA (SCC) CASES ACCORDING TO INVOLVED SITES AND LATERALITY. (N=149)

S.No	Site	Number	Percentage	Laterality			Percentage %		
				left	Right	Midline	Left	Right	Midline
1.	Face	112	75%	61	47	04	54%	42%	3.6%
2.	Neck	08	5.3%	00	00	00	00%	00%	00%
3.	Chest	02	1.3%	00	00	00	00%	00%	00%
4.	Abdomen	01	0.7%	00	00	00	00%	00%	00%
5.	Upper Limb	08	5.3%	00	00	00	00%	00%	00%
6.	Lower Limb	08	5.3%	00	00	00	00%	00%	00%
7.	Foot	06	04%	00	00	00	00%	00%	00%
8.	Hand	04	2.6%	00	00	00	00%	00%	00%

TABLE 04: BASAL CELL CARCINOMA (BCC) CASES ACCORDING TO INVOLVED SITES AND LATERALITY. (N=119)

S.No	Site	Number	Percentage	Laterality			Percentage %		
				left	Right	Midline	Left	Right	Midline
1	Face	113	95%	44	64	05	39%	56.5%	04%
2	Neck	03	02%	00	00	00	00%	00%	00%
3	Chest	00	00%	00	00	00	00%	00%	00%
4	Abdomen	00	00%	00	00	00	00%	00%	00%
5	Upper Limb	02	00%	00	00	00	00%	00%	00%
6	Lower Limb	01	0.8%	00	00	00	00%	00%	00%
7	Foot	00	00%	00	00	00	00%	00%	00%
8	Hand	00	00%	00	00	00	00%	00%	00%

TABLE 05: NONMELANOMATOUS SKIN CANCER CASES ACCORDING TO OCCUPTION. (N=149+144= 293)

S. No	Occupation	Male (N =149)	Percentage	Female (N=144)	Percentage
1.	Farmers	77	51.6%	00	00%
2.	Labours	53	35.5%	04	2.8%
3.	Hawkers	10	6.7%	00	00%
4.	Security works	08	5.3%	00	00%
5.	Office workers	01	0.6%	00	00%
6.	House wives	00	00%	140	97.2%

Discussion:

Human skin is frequently exposed to ultraviolet radiation, ionizing radiation, pollutants, chemicals and occupational exposures are also linked with skin cancers (14).Therefore, a rising incidence of cutaneous malignancies has been observed worldwide (15). Skin cancer liability is considerably rising and there is inadequate updated of cutaneous malignancies related studies in Pakistan revealing a comprehensive negligence towards medical research. The National Health Plan also emphasized on this issue (18). The present study is probably the first of its kind which was carried out in patients presenting with skin cancers in Pathology department of the major hospitals of the Quetta city, though a few studies have been published in other cities of the Pakistan.

We observed in current study that the percentage between of SCC, BCC and BSC was 54.5%, 43.5% and 02% respectively. The SCC is most common cutaneous malignancy observed in our study which is in contrast to the Western data and other studies outcomes carried out in other Provinces of Pakistan where Basal Cell Carcinoma is chief variant and the SCC is the 2nd most

common skin cancer (15-19). A similar difference has also been reported in local studies carried out on South-Western region of Pakistan in which researcher found Squamous Cell Carcinoma is leading (54.23%), over Basal Cell Carcinoma which was reported 31.14% among NMSCs. Similar results were found in current. (15-21). Reasons of highest rate of SCC occurrence could be high altitude and extreme weather conditions in Quetta the capital city of Baluchistan.

Our research identified the ratio between male to female was 1.2:1 and the mean age of the affected patients was 47 years which is slightly less than reported in other studies. While studies conducted in other regions of Pakistan reported male to female ratio was 1.5:1 (22, 23). The males are more prone to the skin cancers as compare to the females. The possible reasons are that the males are having outdoor occupations and daily activities, and they use less protective measures like sunscreen application and usually more exposed to the carcinogens than women. Hence prevention measures should pay extra attention to them (24,25). The other reasons could be that the female residents of this region used to cover themselves perhaps because of seclusion and intense weather conditions.

Squamous Cell Carcinomais a malignancy of the keratinocytes from the epidermis that invade the dermis showing basement membrane breakages, invading the underlying fat, muscle, bones and cartilage. Also, metastasize to regional lymph nodes and distant sites (26).

Our research unveils a significant involving of facial area by SCCs about 75%, 5.3% cases were noted on neck and trunk, 04% on foot and 02% on hands. Most of the cases were observed on left sided body.

Basal Cell Carcinoma initiates from the epidermal pluiropotential epithelial cells and skin appendages. It is frequently seen in blue eyed individuals having fair complexion. Clinically presented as small, translucent or pearly lesion's with raised areas and telangiectasia on face. The rodent ulcer is the classic form, which has an indurate edge and ulcerated center. This cancer has sluggish growth but, if ignored, leads to massive devastation, particularly around the nose, ear or eye involving the periorbital tissues and bone (25, 26).

In the present study, approximately 95% of BCCs occur on face, 02% on neck, 01% on upper and 0.8 % on lower limb. While Basal cell carcinoma presented on the hand and foot was rare.

According to current study, the Farmers (52%) were prone to skin cancers followed by labours, hawkers and security workers among males while office workers were least vulnerable employment. Almost majority (97%) in female patients were house wives suffering from skin cancer.

A comparatively unusual type of NMSCs is Basosquamous Carcinoma with more aggressive behavior having different clinical and histologic morphology lying between squamous cell carcinoma and basal cell carcinoma (27). We analyzed 05 cases of BSC accounting for 02% cases of NMSCs.

Although cutaneous malignancies are basically an illness of the elderly people but it can appear in youngsters (28).Such cancers are hardly associated to the environmental risk factors in young adults, rather the inherited genetic factors play a significant fundamental role (29). For example the Xeroderma Pigmentosum (XP) which was first introduced by dermatology Professor Moritz Kohn Kaposi, in 1874, is an autosomal recessive inherited disorder, presented as photo sensitivity and marked susceptibility to cutaneous malignancies. The condition is characterized by mutations in DNA repairing genes involved in the DNA repair which is damaged by ultraviolet radiation (UVR) (30).

In conclusion, our study specified that there is huge difference in the data regarding skin cancers as compare to the other region of Pakistan and neighboring countries. SCC is more prevalent than BCC in our region. The Basosquamous cell carcinoma is less common cutaneous malignancy. Skin cancer is observed in young patients.

Conclusions:

- Cutaneous malignancies are the major health issue in Balochistan, which is the biggest Province of Pakistan.

- The leading purpose of this research was to improve awareness regarding skin cancers by providing recommendations to clinicians and the community for early detection and photo protection preventive measures to reduce the disease related mortality.
- Skin cancers are most common among the male group, experienced much higher rates of cancer occurrence as compared to unexposed individuals which can be resulted in special coating body for women when compared with men.

Recommendations:

- The actual incidence of the said malignancies is definitely very high which is not highlighted previously.
- All the clinicians should contribute to the achievements in order to know the exact prevalence of the cancer fundamentals in this Province.
- We describe critical lack of skin cancer research in Pakistan reflecting a widespread abandonment to healthcare research as also emphasized in the National Health Plan.

Conflicts of interest: The authors declare no potential conflicts of interest.

Authors' Contribution:

- **S Gul, AU, SMI & SP**: Conceived/ designed, analysis and editing of manuscript and agreement to be accountable.
- **ZM & MU:** Help in data collection, and drafting the manuscript.
- **MZ, AJP & A Gul**; Help in data collection and statistical analysis.

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