FREQUENCY AND CHARACTERISTICS OF SKIN CANCERS DIAGNOSED AT AYUB MEDICAL COLLEGE, ABBOTTABAD PAKISTAN FROM 1995-2003

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Background: Our histopathology laboratory serves mountainous area of Hazara Division in Northern Pakistan. This study is an analysis of the records of skin cancers reported over a nine years period to develop local statistics about frequency and characteristics of skin cancers. **Methods:** Data from 1995-2003 record of cancers reported by Department of Pathology, Ayub Medical College, Abbottabad were analysed to calculate cumulative and year wise frequency of skin cancers and their major types. Frequency distribution with reference to gender and age was also calculated. **Results:** Skin cancers were 220 (1.04%) out of the total 21075 cancers recorded during this period. Squamous cell carcinoma was diagnosed in 118 (53.6%), Basal cell carcinoma in 88 (40%) and Malignant melanoma in 14 (6.4%) cases. The mean age for all skin cancers considered together was 58.75±15.21. Non Melanoma Skin Cancer (NMSC) were seen in all age groups (minimum 15, maximum 103 years), while no malignant melanoma patient was under 35 years of age. Gender difference in distribution was negligible with slight male preponderance (23:21). Malignant melanoma was significantly (p<0.05) more in males (71.4%), while distribution of both the types of NMSC was non-significantly in favour of males. We found no significant rise or fall in total skin cancers or any type of skin cancer in this 9 years period. **Conclusions:** At present the frequency of skin cancer is stable at around 1 % of total cancers reported at Ayub Medical College, reflecting a stable very low incidence rate of skin cancer in Hazara Division of Pakistan.

Keywords: Skin Cancer, Malignant melanoma, Non melanoma Skin Cancer, Pakistan, Histopathology

INTRODUCTION

Skin cancer is the most common type of cancer in fair-skinned populations around the world. The incidence and mortality rates of skin cancers are dramatically increasing and thus pose a threat to public health.[1] Skin cancer is more common in Caucasians as compared with Africans, Asians, Latin-Americans, and American-Indians. However in these later groups it is associated with significant morbidity and mortality due to atypical presentations.[2] The American Cancer Society estimates that in the United States more than 700,000 new skin cancers are diagnosed annually.[3]

Broadly the skin cancers are grouped as melanomas and non-melanoma skin cancers. Basal Cell Carcinoma (BCC) and Squamous Cell Carcinoma (SCC) are the commonest types of non melanoma skin cancers.[4] These two types are the most frequent skin cancers as well.[5] Non-melanoma skin cancer (NMSC) differs from other forms of cancer by a high incidence combined with a very low lethality.[6]

NMSC is the most common malignancy occurring in white populations. Possible factors driving this rise in NMSC numbers are increases in both acute and prolonged ultraviolet (UV) exposure together with increasing numbers of older people in the population.[7] The exaggerated and repeated exposure to ultraviolet radiation coming from the sun has been regarded as the most important risk factor for skin cancer. This in turn is blamed upon a sustained depletion of stratospheric ozone levels. As the ozone layer restricts the transmission of type B and C ultraviolet light.[8] Other factors such as immunological status, genetic predisposition and infection by human papillomavirus (HPV) may also be involved.[9]

Malignant melanoma is the most rapidly increasing cancer in Caucasians throughout the world. The increased incidence is due to greater sun exposure arising from changes in clothing habits and life-styles over the past fifty years.[10] Cutaneous melanoma is an increasingly common public health problem in industrialized nations.[11] There is increased world-wide concern about the rising incidence of melanoma and non-melanoma skin cancer.[5] In the developed world, despite educational programs designed to prevent melanoma, the mortality and incidence rates for the disease have soared steadily. More than half of the presented cases of melanoma can be explained solely as sun-caused.[12]

Our laboratory is the only public sector referral centre for histopathology in a very vast mountainous region in the North of Pakistan (Hazara Division Coordinates 34° 30′ 0″ N, 73° 15′ 0″ E, total area: 18404 km², total population: 4.2 million).[13]

Population of this area lives in some of the highest mountains of the world in Galiyat, Kaghan valley, Kohistan and Northern areas of Pakistan. The altitude varies from 471m (Tarbela) to 4173m (Babusar Pass). The exposure to sunlight differs from no sun to a lot of sun depending on the position of an area with respect to mountains in the vicinity. The skin colour of the population is fairer than the 'wheatish brown' complexion generally seen in the country. There are no compiled statistics available about skin cancer from this area. This study is an analysis of the records of skin cancers reported by our laboratory in a nine years period to develop local statistics about frequency and types of skin cancer in Hazara division of Pakistan.

MATERIAL AND METHODS

This study was carried out at Department of Pathology, Ayub Medical College, Abbottabad, Pakistan in 2007. Data of all histopathology work carried out and registered at our laboratory during the period 1-Jan-1995 to 31-Dec-2003 were analysed. Variables recorded were the laboratory number, date of reporting, name, age, gender, and final histological diagnosis. The cases for which record of gender, age and final diagnosis was not available were excluded.

Total malignancies and total skin cancers diagnosed microscopically were counted for each year. Frequency of types of skin cancer, i.e., squamous cell carcinoma, basal cell carcinoma and malignant melanoma diagnosis were also counted for each year. Cumulative and year wise frequencies of total skin cancers out of the total cancers were calculated for both males and females. Recommendations of International Agency for Research on Cancer (IARC) were followed with respect to classification and coding.[14]

RESULTS

Out of a total of 21075 cancers recorded during this period of nine (9) years (1995-2003) skin cancers were 220 (1.04%). Out of these 115 (52.3%) were males and 105 (47.7%) females (M:F= 23:21). NMSC were 206 (93.6%) of total skin cancers and malignant melanoma 14 (6.4%) cases. Out of the NMSC squamous cell carcinoma was diagnosed in 118 (53.6%) and basal cell carcinoma in 88 (40%). Distribution of these skin cancers with respect to age, gender and year are summarized in tables 1-3.

Table-1: Mean age of the patients presenting with different types of skin cancers (n=220)

Type of skin Cancer	Mean ± SD	Min-Max	Remarks
Squamous Cell carcinoma (n=118)	58.00±15.25	15-100	12 cases <40 years, 2 cases <30 years
Basal cell carcinoma (n=88)	59.54±15.66	17-103	6 cases <40 years, 3 cases <30 years
Malignant Melanoma (n=14)	60.07±12.37	35-80	1 case <40 years, No case <30 years
All skin Cancers (n=220)	58.75±15.21	15-103	19 cases <40 years, 5 cases <30 years

Table-2: Distribution of skin cancer types according to gender of the patients

Type of tumour	Males	Females
Squamous Cell carcinoma (n=118)	60 (50.8%)	58 (49.2%)
Basal cell carcinoma (n=88)	45 (51.1%)	43 (48.9%)
Malignant Melanoma (n=14)	10 (71.4%)	4 (28.6%)
All skin Cancers (n=220)	115 (52.27%)	105 (47.73%)

Table-3: Distribution of skin cancer patients with reference to type and year

Year	Frequency Skin cancer/Total cancers diagnosed	Squamous Cell Carcinoma	Basal Cell Carcinoma	Malignant Melanoma
1995	25/1972 (1.26%)	12 (48%)	8 (32%)	5 (20%)
1996	32/2222 (1.44%)	15 (46.9%)	13 (40.6%)	4 (12.5%)
1997	13/2015 (0.64%)	10 (76.9%)	3 (23.1%)	0 (0%)
1998	21/2272 (0.92%)	8 (38.1%)	12 (57.1%)	1 (4.8%)
1999	27/2407 (1.12%)	22 (81.5%)	5 (18.5%)	0 (0%)
2000	13/2564 (0.50%)	5 (38.5%)	8 (61.5%)	0 (0%)
2001	30/2640 (1.13%)	19 (63.3%)	10 (33.3%)	1 (3.33%)
2002	37/2642 (1.4%)	16 (43.2%)	20 (54.11%)	1 (2.7%)
2003	22/2341 (0.93%)	11 (50%)	9 (40.9%)	2 (9.1%)
Total	220/21075 (1.04%)	118 (0.559%)	88 (0.417%)	14 (0.066%)

DISCUSSION

Skin cancer is less common in persons with coloured skin but is often associated with greater morbidity and mortality. Early detection of these tumours is therefore very important.[15] This analysis of record was carried out to provide an idea of frequency, types and time trend of skin cancers from an area for which very few reliable statistics for cancers are available. We found skin cancers to be just 1.04% of the total cancers reported over a fairly long period of nine years. This reflects a very low frequency of skin cancers in this area. Although we have no scientific evidence to give reason for this very low frequency reflective of stable incidence rate of skin cancer in this area, yet we can safely assume that probable reason is absence of most, if not all of the several attributable risk factors for skin cancer.

Races of intermediate pigmentation, such as Hispanics and Asians, share epidemiologic and clinical features of dark-skinned ethnic groups and Caucasians.[15] However in contrast to most of the current international trends our results show no trend of increase or decrease in frequency of skin cancers over this reasonably long period of nine years. The up and down in incidence rates all over the world can be assessed from results of various contemporary studies.

The incidence of melanoma has raised 3–7% on an average over several decades, and even more rapidly among Caucasian men and the elderly.[16] In some areas of the world there is an alarming rise in incidence of melanoma. A classical example is that of Queensland, Australia. This state has the highest incidence of melanoma in the world. A two decades (1982-2002) study reported that *in situ* melanomas increased by 10.4% per year among males and 8.4% per year among females.[17]

NMSC is the most common cancer in Australia. Incidence rates of NMSC continue to rise in Australia. A study examined trends in incidence of these between 1985 and 1995. It was found that there was an increase of 19% in Basal cell carcinoma rates in a period from 1985–95, while squamous cell carcinoma rates rose by 93% over the same period.[18]

A report from Connecticut Tumour Registry, USA for exactly same period as ours (1997–2003) indicates a continuous rise in incidence rates of malignant melanoma of the skin,[19] whereas 'The Rhode Island Follow-Back Study' revealed a consistent decline in nonmelanoma skin cancer mortality rates from 1969 through 1988.[20]

Studies from Asian populations are scarce. A Japanese study for a period from 1987–2001 from 94 centres showed an increase of about 1.5 fold for basal cell carcinoma or 1.7 fold for squamous cell carcinoma or malignant melanoma.[21] A study from Singapore Cancer Registry reported an increase in the incidence rates of skin cancer from 1968–97. Fairer skinned Chinese had a higher incidence of skin cancer. There was an overall increase of skin cancer from 6.0 per 100000 person years (1968–72) to 8.9 per 100000 person years (1993–97). Basal cell carcinoma incidence increased 3% annually, melanoma remained constant, and SCC decreased 0.9% annually. The most interesting observation was that Basal cell carcinoma was highest among Chinese, then Malays and Indians. A similar pattern was noted for squamous cell carcinoma and melanomas. [22]

In our study most of the skin cancers (i.e., 93.6%) were NMSC. Out of the NMSC squamous cell carcinoma was maximum (53.6%). In dark skinned ethnic groups, squamous cell carcinoma is most common; squamous cell carcinoma and melanoma usually occur on non-sun-exposed sites; and ultraviolet radiation is not an important etiologic factor for skin cancer with the exception of basal cell carcinoma.[15]

Our results are different from the results of a single year study carried out at Jinnah Postgraduate Medical Centre, Karachi, Pakistan where basal cell carcinoma was on top of the list with 36/75 (48%) cases, followed by squamous cell carcinoma (40%), malignant melanoma (6.66%), Bowen`s disease (2.66%), Basi-squamous tumour (1.33%) and malignant trichilemmal tumour (1.33%).[23]

A recent study from 94 centres in Japan reported that basal cell carcinoma has the highest incidence and accounts for nearly 50% of all skin malignancies, followed by squamous cell carcinoma (31%) and malignant melanoma (21%) in Japan.[21]

NMSC were seen in all age groups with minimum age 15 and maximum 103, while in malignant melanoma very young persons were not seen. The age range was from 8 to 92 years in the study of 75 cancer patients at Karachi by Yasmeen *et al*.[23]

Our study has reported a male to female ratio of 23:21 in 220 cases. The difference between males and females was negligible with slight male preponderance. Malignant melanoma was more in males (71.4%), while distribution of both the types of NMSC was non significantly in favour of males. In the U.S., the incidence of melanoma in men is higher than in women after the age of 40, and the difference between men and women increases from age 40 until the end of life.[16] While for NMSC the rate among men was twice that among women in nearly 75,000 deaths attributed to NMSC in the United States from 1969 to 2000.[24]

In a study from Karachi the male to female ratio was 12:7 in 75 skin cancer patients studied.[23] In an analysis of 24898 cancer patients at Institute of Radiotherapy & Nuclear Medicine, Peshawar, Pakistan from January 1990 to October 1997 skin cancers were reported to be predominant in adult males.[25] The age-standardized rates (ASR) for skin cancer calculated for the period of 1998 to 2002 in Hyderabad, Pakistan were 3.2/100,000 in males while the figure was much less in females.[26]

CONCLUSIONS

From this analysis of nine years data and comparison with contemporary studies we conclude that at present the frequency of skin cancer is stable at around 1% of total cancers reported at pathology department of Ayub medical college, Abbottabad reflecting a stable very low incidence rate of skin cancer in Hazara division of Pakistan. Non melanoma skin cancer is the commonest with frequency of its subtype squamous cell carcinoma being maximum in this area.

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