

Basal cell carcinoma of the lower extremities

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Background: Basal cell carcinoma (BCC), the most common form of skin cancer, usually occurs in the sun-exposed areas of the body like head and neck, yet is also seen in unexpected sites. Myriad studies have mentioned a lower limb BCC incidence rate of 1.5-13.5%.

Methods: The present retrospective cross-sectional study was conducted on 650 BCC patients, who were referred to the dermatology tumor clinic of Razi hospital from 2008 to 2012 with confirmed biopsy results of BCC. Patient characteristics including age, sex, relevant history and physical examination and tumor characteristics such as location and pathological subtypes were recorded.

Results: The prevalence of lower limb BCC was 1.53% with the mean age of 69.5 years and a male to female ratio of 2.33:1. Of 10 cases with BCC on the lower extremities, 6 were on the legs, 3 on the thighs and 1 on the foot. The most frequent pathological type was nodular and constant UV exposure was the most important risk factor (60%). Other underlying factors were chemical exposure, chronic ulcer and history of radiation.

Conclusion: BCC of the lower limbs is more prevalent in men compared with women. Moreover, UV exposure is the most important risk factor for BCC. On the other hand, factors like ulcers, radiation and chemical exposure have to be further considered.

Keywords: basal cell carcinoma, location, lower extremity

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INTRODUCTION

Basal cell carcinoma (BCC), belonging to the group of non-melanoma skin cancer, is the most prevalent form of skin neoplasm and the most common type of cancer in human. BCC originates from the basal cells of the epidermis and appendages ¹. The most common histological type is nodular which appears as pearly and telangiectatic papules or nodules and may be ulcerated or pigmented ². Other types include superficial, infiltrative, micronodular, multifocal, morpheaform and mixed ³. Superficial BCC occurs more frequently on the trunk and extremities,

affecting younger patients more than nodular BCC. Infiltrative BCC has an opaque whitish-yellow color that may blend with the surrounding skin and render clinical diagnoses more challenging ³.

The incidence of BCC is strongly associated with exposure to UV radiation. Among other risk factors, mention can be made of fair complexion, genetic predisposition, exposure to ionizing radiation, arsenic, tobacco, coal tar, burns, scars, chronic ulcerations and immunosuppression ⁴. BCC accounts for about two-thirds of all skin cancers in Europeans, and in the US, corresponding to approximately one million cases per year ⁵. BCC incidence rates have augmented over the past

few decades and some studies have shown higher rates in men than women ⁶. This skin condition, occurring in different ages, is, more often than not, seen in patients over 40 years old ⁷. Up to 85% are located on the head and the neck ⁸, but it can also be found in rare locations. Different studies have shown the prevalence rate of 1.5 to 13.5% concerning BCC in lower extremities ⁹.

The objective of the present research was to assess the demographic characteristics of patients with BCC based on disease location and histological subtypes. Further evaluated were etiological factors in patients with BCC on the lower extremities.

MATERIALS AND METHODS

The study was approved by the research deputy of Tehran university of medical sciences. This retrospective cross-sectional study included 650 patients who were referred to skin tumor clinic of Razi hospital over 4 years, with confirmed BCC according to biopsy results. Characteristics such as age, gender, history and tumor data including histopathological type and anatomical site were collected. Also recorded was the relevant past medical history comprised of sun and chemical exposure, scars or chronic ulcers and others. Histopathological types were divided into nodular, superficial, micronodular, infiltrative, macronodular, sclerosing, adenoid, ulcerative and morpheaform. Anatomical sites were classified as face, head, neck, trunk, upper extremities and lower extremities.

SPSS version 18 was employed for statistical analysis and to access the relation between sex and histological subtypes, Fisher's exact test was made use of. P-value less than 0.05 was considered to be statistically significant.

RESULTS

Among the 650 patients, 268 (41.2%) were males and 382 (58.8%) were females with mean ages of 67.2 years and 74.6 years, respectively. Of the 650 patients, 333 (51.2%) presented with nodular subtype, 120 (18.5%) with superficial, 97 (14.9%) micronodular and the 100 remaining had other subtypes, outlined in Table 1. The most common histological subtype in both females and males was nodular, followed by superficial; moreover, there was no significant difference between males and females in BCC subtypes (P value =0.33).

Amongst the 650 cases, 388 lesions (59.69%) were located on the face (M=142, F=246), 188 (28.92%) on the head (M=91, F=97), 39 (6%) on the neck (M=14, F=25), 21 (3.23%) on the trunk (M=12, F=9), 4 (0.62%) on the upper extremities (M=2, F=2) and 10 (1.54%) on the lower extremities (M=7, F=3). The BCC cases of face, neck and head were most frequently observed in aging 60-70 years old. As shown in Figure 1, BCCs of the lower extremities were more commonly seen between 50 and 70 years of age.

Six cases of BCC on the lower extremities were observed on leg, 3 on thigh and 1 on toe. Of the 10 cases of lower extremities, 6 were presented as pigmented plaques and nodules and 4 were ulcerated nodular lesions. Histological subtypes of the lesions consisted of 4 nodular, 2 mixed micronodular-infiltrative, 1 superficial, 1 infiltrative, 1 micronodular, and 1 mixed nodular-superficial.

Among the 10 patients with BCC on the lower extremities, 6 had constant exposure to sunlight, 3 had a history of concurrent cancer (2 concurrent BCC on the head and neck, and 1 stomach cancer), 1 had a history of radiotherapy (in the head and neck area for the treatment of childhood tinea

Table 1. Histological subtypes of patients with BCC.

Pathological type	Female (%)	Male (%)	Total (%)
Nodular	191 (50%)	142 (53%)	333 (51.2%)
Superficial	76 (19.9%)	44 (16.4%)	120 (18.5%)
Micronodular	53 (13.9%)	44 (16.4%)	97 (14.9%)
Infiltrative	37 (9.7%)	17 (6.3%)	54 (8.3%)
Sclerosing	12 (3.2%)	5 (1.9%)	17 (2.6%)
Macronodular	4 (1.05%)	5 (1.9%)	9 (1.4%)
Adenoid	3 (0.78%)	6 (2.2%)	9 (1.4%)
Morpheaform	3 (0.78%)	3 (1.1%)	6 (0.9%)
Ulcerative	3 (0.78%)	2 (0.7%)	5 (0.8%)
Total	382	268	650

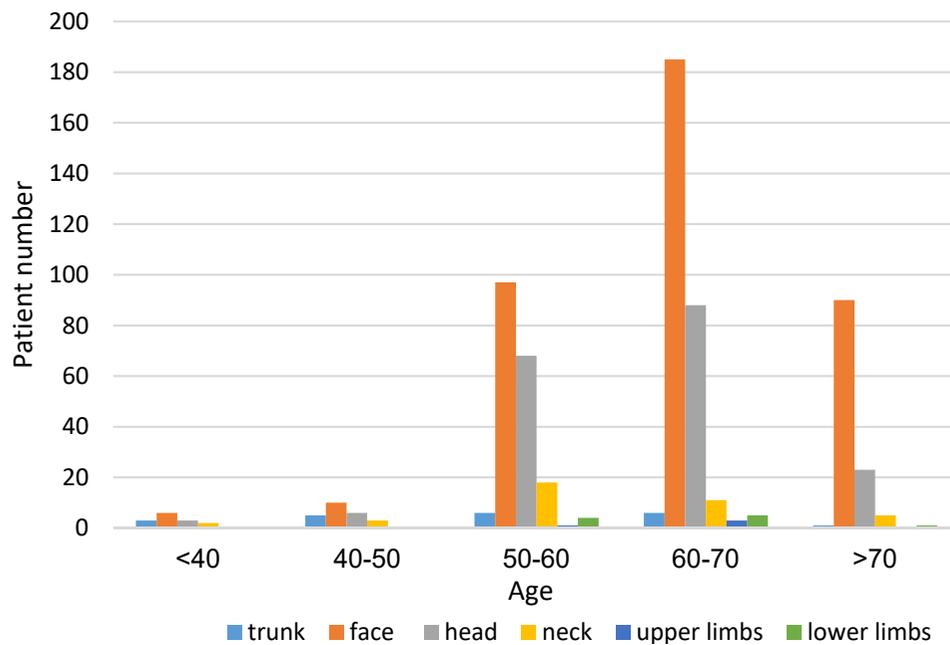


Figure 1. The distribution of BCC in anatomical sites based on age

capitis), 1 had a chronic ulcer (due to venous insufficiency) and 3 had been exposed to chemicals (agricultural pesticides).

DISCUSSION

Among the 650 patients in this study, 268 (41.2%) were males and 382 (58.8%) were females, which is similar to Scrivener's study where 4912 BCC cases were seen in men and 5330 were observed in women¹⁰. Furthermore, in the study by Andrade *et al.* the percentage of BCC in men and women was 47.6% and 52.4%, respectively¹¹. In certain studies, on the other hand, the number of men with BCC was reported higher than females. In Rubin's study, 407 cases of BCC per 100000 men and 212 cases of BCC per 100000 women were observed⁴. In yet another study conducted by Ghanadan *et al.*, 876 patients with BCC were examined, 544 of whom were men and 332 were women³.

In the current research, of the 650 patients, 333 (51.2%) presented with nodular subtype, 120 (18.5%) with superficial, 97 (14.9%) with micronodular, 54 (8.3%) with infiltrative, 17 (2.6%) with sclerosing, 9 (1.4%) with macronodular, 9 (1.4%) with adenoid, 6 (0.9%) with morpheaform and 5 (0.8%) with ulcerative, which is partially similar to Scrivener's study where 9633 cases of nodular BCC, 1850 instances of superficial BCC and 761 morphoeiform

BCC were reported¹⁰. Also, in Ghanadan's study, 379 (43.0%) cases presented with nodular subtype, 284 (32.4%) with mixed subtype, 27 with superficial and the remaining 186 had other subtypes³. In another study by McCormack *et al.* on 3885 BCC cases, there were 2479 (63.8%) cases of nodular subtype, 577 (14.8%) instances of superficial, 111 (2.9%) cases of morpheaform and 660 (21.4%) examples of other subtypes¹².

In this study, 35 (5.38%) of the cases were located on unusual locations, among which, 3.85% were on the trunk and upper extremities and 1.54% were on the lower extremities. According to the previous studies, the frequency of lower limb BCC is 1.5-13.5%, which is in accordance with the present investigation, because of the culture and type of clothing in Iranian population¹⁰⁻¹². Of the 10 BCC cases on the lower extremities, 7 were observed in males and 3 in females, which is inconsistent with some previous studies. In the study by Scrivener *et al.*, female to male ratio was 1.62:1 and Andrade *et al.* observed that females had 2.18 times higher BCC of the lower extremities comparisons with males^{10,12}. In our study, the higher prevalence of BCC in men is due to their occupation and the fact that they are more exposed to sunlight because of their clothing culture.

The average age in patients with lower limb BCC was 69.5 years in this study (74.6 in females

and 67.2 in males). Six cases of BCC on the lower extremities were observed on leg, 3 on thigh and 1 on toe. As in other studies, the most prevalent anatomic site was the leg, followed by the thigh, which is due to more sun exposure. In the study conducted by Roberto Betti et al., of the 45 BCC cases on the lower extremities, 28 were on the leg, 12 on thigh, 3 on foot and 2 on groin¹³. In Andrade et al. study, of the 35 lower limb BCCs, 32 were on the leg, 2 on thigh and 1 on foot¹¹. In our research, 6 of the 10 patients with BCC of the lower extremities had constant exposure to sunlight, underlining the significance of UV exposure. There are reports of BCCs occurring in venous ulcer sites¹⁴ and it is shown that BCCs can be presented as non-healing ulcers¹⁵. This highlights the importance of biopsy in suspicious and non-healing ulcers in lower extremities. In this regard, one of our patients had a history of chronic venous ulcer. Chronic ulcers can be caused by venous insufficiency, peripheral artery diseases or diabetes. YANG et al. conducted a research on 981 patients with 2448 ulcers, where 43 malignancies were observed, 75% of which were BCC and 25% were SCC¹⁶. It is to be noted that one of our patients had a history of childhood radiotherapy and 3 had been exposed to chemicals. Amongst the 10 cases of lower extremities, 4 were nodular, 1 was superficial, 1 was infiltrative, 1 was micronodular, 1 was mixed nodular-superficial and 2 were mixed micronodular-infiltrative. In certain studies carried out on the BCC of the lower limb, the superficial type has been reported as the most frequent type^{9,17}, while in others, the nodular type was predominant^{10,13}.

CONCLUSION

The prevalence of BCC on the lower limbs is higher in men than women, underscoring the role of UV exposure as the most important risk factor for BCC. However, other factors like ulcers, radiation and chemicals exposure have to be further taken into account.

Conflict of Interest: None declared.

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