

Original Research Article

Basal cell carcinoma- a prospective clinico epidemiological and pathological study

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ABSTRACT

Background: Basal cell carcinoma is the most common malignant tumour of the skin worldwide. The objective was to find out the age and sex incidence of basal cell carcinoma in patients attending the outpatient department of dermatology and to find out the various clinical and histopathological features of basal cell carcinoma.

Methods: It was a prospective observational study carried out in a tertiary care hospital, Chennai, Tamilnadu, India. Patients with clinical diagnosis of basal cell carcinoma were included in the study after thorough history, clinical examination, routine and special investigations like skin biopsy.

Results: Out of 20 patients with basal cell carcinoma 6 were males and 14 were females with a male to female ratio of 1:2.33. Most commonly affected age group was 50-70 years (70%). Distribution of BCC in our study was confined to head and neck area. Most common morphological subtype encountered in this study was nodular/nodulo-ulcerative BCC (70%), followed by pigmented type (25%) and superficial BCC (5%). The most common histological variant observed in present study was nodular type (55%), followed by pigmented variant (25%), adenoid (5%), basosquamous (5%), superficial BCC (5%) and BCC with sebaceous differentiation (5%).

Conclusions: This study highlights a paradoxically increasing trend of BCC with female predilection. Early detection and treatment of lesions are crucial to decrease the functional and cosmetic disfigurement and also this study highlights the importance of improving awareness among general practitioners, public health workers and general population.

Keywords: Basal cell carcinoma, Clinical variants, Excision biopsy, Histopathology

INTRODUCTION

Basal cell carcinoma is the most common malignant skin tumour and the most prevalent cancer type among white-skinned populations worldwide and particularly in industrialized Western societies.¹ In addition, the incidence of skin cancer is rising all over the world. Geographical location plays an extremely important role in the distribution and frequency of incidence rates. In

people with outdoor occupations like miners, quarry men, railway engine drivers and firemen, the frequency of BCC is high.² It is a slow-growing malignant tumour of the skin that invades the adjacent tissues with a metastatic incidence of 0.01%-0.028%.³ Ultraviolet radiation plays a major role in the development of BCCs. Radiation exposure, exposure to arsenic salts, chemical carcinogens, chronic irritation, chronic inflammation, pre-existing skin lesions such as discoid lupus

erythematosus, burn scar and vaccination scar are the various other causal factors.⁴ Ethnic differences in types of skin, immunological and genetic factors also play a role in the development of BCC. Males are most commonly affected than females. BCC generally occurs in adults over 40 years of age but it may occur in children and young adults.⁵ In children it is usually associated with genetic defects such as xeroderma pigmentosum, nevus sebaceous, nevoid basal cell syndrome, Rombo syndrome or Bazex syndrome.

Aims and objectives

To find out the age and sex incidence of basal cell carcinoma in patients attending the out-patient department of dermatology, Rajiv Gandhi government general hospital, Chennai, Tamilnadu, India. To find out the various clinical presentations of basal cell carcinoma such as morphology, location and size and to find out the histopathological features of the various types.

METHODS

It was a prospective observational study conducted for a period of one year from October 2014 to September 2015 in patients attending outpatient department of dermatology, Rajiv Gandhi government general hospital, Chennai, Tamilnadu, India.

Patients who attend the dermatology outpatient department, Rajiv Gandhi government general hospital with a clinical diagnosis of basal cell carcinoma are selected for the study. Thorough history related to age, sex, occupation and duration of the lesions are noted. Specific and relevant history about the lesion was taken, including family history. History of any medical or surgical interventions are noted. Thorough clinical examination of the lesions with reference to site, number, size, shape, colour, surface, border and consistency of the lesion are noted. Routine investigations like complete blood count, random blood sugar, bleeding time, clotting time, HIV 1and2 antibody, VDRL and X-ray chest are taken for all the patients. Using pretested proforma, patient details, clinical findings and investigations are recorded. Excision biopsy was done at plastic surgery department. Excised specimen was received for histopathological examination. Sections are stained with H and E and studied in both low and high-power magnifications. Pathologist opinion was obtained. Clinical and histopathological correlation was done

RESULTS

Sex distribution of basal cell carcinoma

Total of 20 patients with basal cell carcinoma were included in the study. Out of this, 6 patients were males and 14 patients were females. Hence in our study basal cell carcinoma was more common in females (70%) than males (30%). Male to female distribution was 1: 2.33.

Table 1: Sex wise age distribution of BCC.

Age group	Male	Female	Total	Percentage
11-20	1	0	1	5%
21-30	0	0	0	0
31-40	2	0	2	10%
41-50	1	0	1	5%
51-60	2	6	8	40%
61-70	0	6	6	30%
71-80	0	2	2	10%

Age distribution of BCC

Age of the patients ranged from 10-80 years. The most commonly affected age group was 51-60 years with 8 (40%) patients, closely followed by 61-70 years age group with 6 (30%) patients. Hence in our study basal cell carcinoma was most common in the age group of 51-60 years.

Distribution of BCC according to site

Distribution of lesions were confined to head and neck area. The most common site of involvement was nose (30%). It was followed by periocular area (25%), cheek (15%), forehead (10%), post auricular area (10%), upper lip (5%) and chin (5%).

Table 2: Distribution of BCC according to site.

Site	No-20
Nose	6
Periocular area	5
Cheek	3
Forehead	2
Post auricular area	2
Upper lip	1
Chin	1

Morphological types of BCC

Most common morphological subtype of BCC was nodular/nodulo-ulcerative growth (70%). It was followed by pigmented variant (25%) and superficial BCC (5%).



Figure 1: Basisquamous carcinoma. A 65 year old female with nodulo-ulcerative growth on left cheek, histologically confirmed as basisquamous carcinoma.



Figure 2: Nodular BCC, pigmented variant.

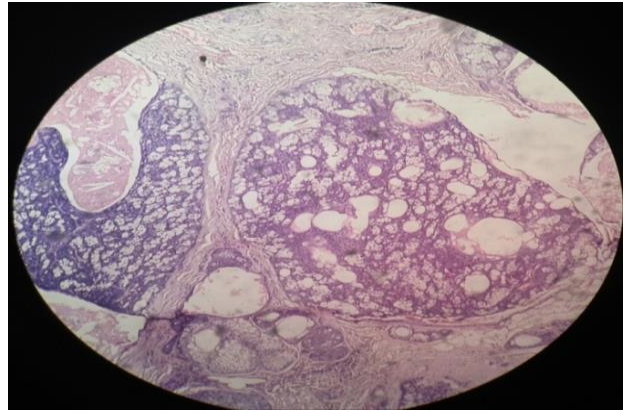


Figure 5: BCC with sebaceous differentiation.



A 14 year old male with diffuse freckling on face suggestive of Xeroderma pigmentosum and Nodulo-ulcerative growth on right side of nose.

Figure 3: Nodulo-ulcerative BCC.

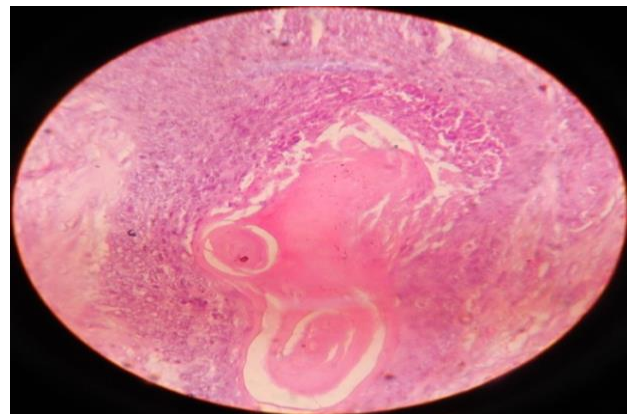


Figure 6: Basisquamous carcinoma showing focal keratinization consisting of pearls with a colloidal center and an outer row of basaloid cells.

Table 3: Morphological types of BCC.

Morphology	No-20	Percentage
Nodular / Nodulo-ulcerative	14	70%
Pigmented	5	25%
Superficial	1	5%

Histopathological variants of BCC

The most common histopathological variant was Nodular subtype (55%) with significant proportion of tumors being pigmented (25%). Other subtypes included basisquamous (5%), adenoid variant (5%), BCC with sebaceous differentiation (5%) and superficial BCC (5%).

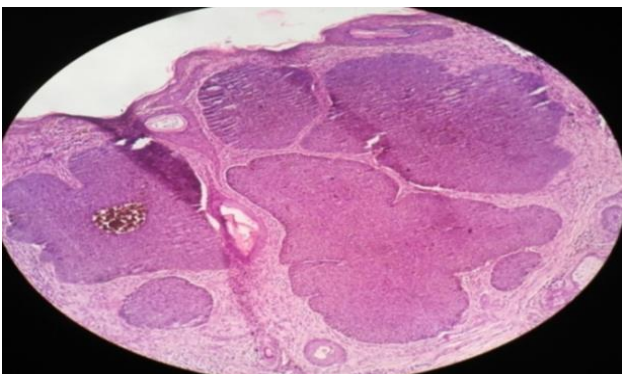


Figure 4: Nodular basal cell carcinoma shows nodular tumour with peripheral palisading.

DISCUSSION

In this study we included total of 20 patients with basal cell carcinoma. Among these 6 patients were males and 14 patients were females.

Sex distribution

In present study, females were most commonly affected (70%) than males (30%) with a male to female ratio of 1:2.33. It was consistent with Laishram et al, study 'pattern of skin malignancies in Manipur, India, which shows male to female ratio of 1:2 and contrast to western studies, a study conducted by Hakverdi S, retrospective analysis of basal cell carcinoma showed male preponderance.^{6,7}

BCCs are more common in males as reported in most studies worldwide, presumably due to greater occupational exposure to ultraviolet radiation (UVR). However, an unusual female preponderance was noticed in our study. Since Indian housewives especially rural women work in open kitchen during their household chores and work in the fields during sowing and harvesting seasons exposing them to intermittent, high

intensity UVR. It might explain higher frequency of BCC in females in our study as intermittent rather than constant, cumulative UVR exposure is implicated in the pathogenesis of BCC. This female predilection may also be attributed to structurally thinner skin with lower collagen density in the dermis when compared to men.

Age distribution

The most commonly affected age group in this study was 51-60 years (40%), followed by 61-70 years (30%) with a mean age of 56.7 years. It was similar to a study conducted by Obaidullah and Aslam which showed a mean age of 56.3 years.⁸ Maximum age of the patient affected by BCC in our study was 72 years and the youngest age was 14 years.

Although basal cell carcinoma is rare in younger individuals, an increased incidence has also been noticed in children and young adults.⁵ Here we reported a 14 years old male patient with diffuse freckling on the face suggestive of xeroderma pigmentosum and nodulo-ulcerative type of basal cell carcinoma on right side of nose (Figure 3). Xeroderma pigmentosum is a rare autosomal recessive disease characterized by photosensitivity, pigmentary changes and early neoplasia resulting from abnormal DNA repair.

Higher rates of occurrence of BCC among elderly may be due to cumulative UVR induced DNA damage as well as reduced efficiency of immune-surveillance and DNA repair mechanisms with aging.⁹

Distribution of BCC according to site

The distribution of BCC in present study was confined head and neck area. The most common site of involvement was nose (30%), followed by periocular area (25%) and cheek (15%). It is similar to a study conducted by Malhotra et al, 'Basal cell carcinoma in the north Indian population' which showed head and neck being the commonest site (91.2%).¹⁰

Another study conducted by Asif et al, showed nose being the common site (28.9%) followed by eye (24.7%) and cheek (20.4%) which is closely resembles to present study.¹¹

Morphological types of BCC

The most common morphological sub type of BCC encountered in our study was nodular/nodulo-ulcerative type (70%), followed by pigmented BCC (25%) and superficial BCC (5%).

These findings are consistent with a study conducted by Sumirkumar et al, 'A study of basal cell carcinoma in south Asians' which showed common morphological subtype is being nodular/nodulo-ulcerative BCC (77.8%) and pigmented BCC (22.2%).¹²

Nodular / nodulo-ulcerative BCC

Patients with nodular type of BCC, having cutaneous features of skin coloured or hyperpigmented papules, nodules and plaques were present on head and neck area most commonly on nose, periocular and cheek. Some patients with nodulo-ulcerative lesions showed surface changes like ulceration and crusting (Figure 3).

Pigmented BCC

Patients with pigmented BCC will be present as nodular lesions with grey-black pigmentation. In present study, 5 patients were appearing clinically pigmented (Figure 2).

Superficial BCC

Superficial BCC usually appear as erythematous, scaly patches that slowly increase in size by peripheral extension with fine thread like border. The patches usually shows superficial ulceration, crusting and sometimes with central atrophic scarring. Superficial BCC usually occurs on the trunk. But in our study 1 female patient was present with superficial BCC on forehead.

Histopathological variants of BCC

The most common histopathological variant in our study was nodular type (55%) with a significant proportion of tumours being pigmented (25%). Other subtypes included adenoid (5%), basisquamous (5%), superficial (5%) and BCC with sebaceous differentiation (5%).

These findings closely resembled Malhotra et al, study which shows nodular type being the most common histologic variant (64.7%).¹⁰ Common histological features of basal cell carcinomas are:

- Basaloid tumor cells
- Peripheral palisading of lesional cell nuclei
- Cleaving artefact between the epithelium and stroma.

Nodular BCC

It was the most common histological subtype observed in present study. H and E stained smears showed nodules of basaloid cells with peripheral palisade arrangement and peritumoral lacunae were noted in all cases. Some cases showed cystic spaces within tumour masses (Figure 4).

Pigmented BCC

It was the second most common histological subtype in our study. Histological features resembled with nodular BCC, in addition there is presence of melanin within tumour cells and macrophages were noted in pigmented variant.

Superficial BCC

One case presented with superficial BCC with typical features of buds and irregular proliferation of tumour tissue attached to the under surface of the epidermis.

Adenoid BCC

This is the rare histopathological variant of BCC. Here we observed one case with Adenoid basal cell carcinoma. In this type tumour cells were arranged within clusters and focal lace like pattern of cells were made out.

BCC with sebaceous differentiation

It is a rare histological variant of BCC, which shows cystic spaces within the tumour lobules. Here one case presented clinically as nodular type of BCC and histology showed BCC with sebaceous differentiation (Figure 5).

Basisquamous carcinoma

In present study we observed one rare case with histological findings suggestive of basisquamous carcinoma which was clinically appear as nodulo-ulcerative form of BCC. Basisquamous carcinoma (BSC) is a rare epithelial neoplasm with histological features of both basal cell carcinoma (BCC) and squamous cell carcinoma (SCC) and it is linked by a transition zone. It is also known as metatypical epitheliomas. Most common location of BSC is on the head and neck and mainly involving the central face and has a significant male predominance.

In contrast to pure BCC, basaloid cells in basisquamous carcinoma have eosinophilic cytoplasm, often with lack of peripheral palisading and retraction artifact and may exhibit cytoplasmic keratinisation (Figure 6).

Like squamous cell carcinoma, basisquamous carcinoma also more aggressive and locally invasive. Risk of metastasis is more in basisquamous carcinoma than forms of BCC. Metastatic basisquamous carcinoma is difficult to treat and its prognosis is poor.

Treatment and follow-up

All the patients were treated by surgical excision and cosmetic reconstruction was done by the plastic surgery department. The patients were followed up every 6 months and further follow-up was also advised.

CONCLUSION

This study highlights a paradoxically increasing trend of BCC with female predilection. Since early age of onset of basal cell carcinoma being reported in persons with genetic defect, these patients should be advised for periodic follow up and strict photo protective measures.

Early detection and treatment of lesions are crucial to decrease functional and cosmetic morbidity and this study highlights the importance of improving awareness among general practitioners, public health workers and general population. The clinical and epidemiological data collected in this study would serve as a reference for future research and may be helpful in the development of preventive and educational strategies.

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