Histological Variants of Basal Cell Carcinoma in Patients Operated in a Tertiary Level Hospital of Bangladesh: A Retrospective Study

Datta T,[1] *Asaduzzaman,[2] Ray TK,[3] Emita U[4]

Abstract

Introduction: Basal cell carcinoma (BCC) typically affects older persons with photo-exposed areas. Histological classification of BCC is essential for determining the risk of recurrence, assessing the percentage of histological groups, and comparing treatment results.

Aim: This study aimed to determine the frequency of various types of BCCs encountered in our practice, site predilection, age and sex distribution, and histological types that mostly involve the particular age and sex.

Method: This study was conducted in the department of Histopathology, National Institute of Burn and Plastic Surgery, Dhaka. The study was retrospective, observational, and conducted during the period from January 2020 to December 2021 (2 years).

Result: In this study, a total of 31 cases were included. Among them, the most frequent type found was nodular, the majority of cases involved the head and neck region, and were mostly seen in the 6th decade, with female predominance.

Conclusion: In the present study, the majority (93.5%) of the BCC were located on the head and neck region, the average cases was in the 6th decade, mostly found in female patients, and the nodular type of BCC was the most common variant.

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1. *Dr. Tanusree Datta, MBBS, MD (Pathology), Junior Consultant (current charge), Histopathology Department, National Institute of Burn and Plastic Surgery. Dhaka. tanusreebsmmu89@gmail.com*
2. **Dr. Asaduzzaman, MBBS, MD (Pathology), Associate Professor, Histopathology Department, National Institute of Burn and Plastic Surgery. Dhaka. dr.asad37@gmail.com*
3. *Maj. Tapan Kamar Ray, MBBS, FCPS Trainee Officer, Combined Military Hospital, Dhaka, tapanrmc10@gmail.com*
4. *Dr. Umama-Tun-Nesa Emita, MBBS, MD (Pathology), Pathologist, Department of Pathology, Khulna Medical College, Khulna. emita.rmc@gmail.com*

**For correspondence*

Introduction

Basal cell carcinoma (BCC) comprises about 70% of keratinocyte tumors that constitute approximately 90% of all malignant skin diseases.[1] The incidence of BCC is about 2000 cases per 100000 population. The risk for developing BCC in Caucasian men varies between 33% to 39% and 23% to 28% for women.[2] The incidence rate of BCC is lower in the Asian race than the white race. BCC are locally aggressive tumors. BCC affects mainly sun-exposed areas, mostly in the head and half of them affect the skin of cheek and nose.[3] Other less affected sun-exposed areas include the trunk and limbs. About 4% of patients with BCC may involve the genital and perinatal area.[4] The tumour progresses slowly and metastases are found in only 0.5% of cases.[5] The main predisposing factor for BCC is chronic exposure to ultraviolet rays with a wavelength of 290-320 nm.[6] The high doses of UV light result in activation of proto-oncogenes with inactivation of tumor suppressor genes in the keratinocytes and production of free oxygen radicals. These free oxygen radicals combine with the reduced antioxidant protection system that resulting in carcinogenesis. BCC mostly affects the adults, but it can be seen in children with Nevoid basal cell syndrome and in xeroderma pigmentosa.[7] Various exogenous carcinogens such as exposure to the ionizing radiation, arsenic[8], industrial chemical substances such as vinyl chloride,[9] polycyclic aromatic hydrocarbons[10] are also responsible in a lesser extent. There are several clinical types of BCC, which include nodular, superficial multicentric, micronodular, infiltrative, desmoplastic or morphea-like, infundibulocytic, basosquamous, fibroepithelioma of Pinkus, and rare variants like adenoid, clear cell, signet ring cell, plasmacytoid/ myoepithelial, and BCC with neuroendocrine differentiation.[11] Increased recurrences are associated with the infiltrative type and in lesions on the nose and nasolabial fold.[12]

Method

This retrospective observational study was conducted on operated samples of BCC in National Institute of Burn and Plastic Surgery (NIBPS), Dhaka, Bangladesh. These cases had been histologically diagnosed as basal cell carcinoma from January 2020 to December 2021 at the Histopathology department of NIBPS. Corresponding tissue blocks were collected from the archives of above mentioned laboratory, and histological diagnosis from the histopathology requisition form. Hematoxylin and eosin-stained sections were prepared from tissue blocks. Afterwards, hematoxylin and eosin-stained sections of each basal cell carcinoma case were reviewed to determine its different histological variants. Statistical analysis was done using of SPSS 29 software program. Data was expressed in numbers, percentages, and descriptive statistics.

Ethical Issue

This study obtained an ethical clearance certificate from the IRC (Institutional Review Committee) and ERC (Ethical Review Committee) of the National Institute of Burn and Plastic Surgery, Dhaka. No patient permission was taken as the patients' identities were not disclosed in this study.

Result

From January 2020 to December 2021, a total of 31 patients were diagnosed as basal cell carcinoma at the histopathology department of NIBPS, Dhaka. They were distributed according to age, gender, anatomic location, and histological types.

Table I: Distribution of the patients according to age (N=31)

Age (years)	Frequency (n)	Percentage (%)
30 - 39	3	9.7
40 - 49	3	9.7
50 - 59	9	29.0
60 - 69	11	35.5
70 - 79	3	9.7
≥80	2	6.5

Among 31 cases, the ages of the patients ranged from 30-80 years. The highest cases were seen in the 6th decade, and the age group was 60-69 (35.5%). The mean age was 64.5 years.

Table II: Distribution of the patients according to site (N=31)

Site	Frequency (n)	Percentage (%)
Cheek	6	19.4
Forehead	6	19.4
Nose	5	16
Back	2	6.5
Scalp	3	9.7
Post auricular region	1	3.2
Pre-auricular region	1	3.2
Temporal region	1	3.2
Eye region	6	19.4

Mean±SD=3.44±2.3

Table IV shows the site-wise distribution of BCC. According to this table, 93.5% cases of BCC were located in the head and neck region. Among these, the majority were present in the cheek, forehead, and eye region.

Table III: Distribution of the patients according to histology type (N=31)

Histology type	Frequency (n)	Percentage (%)
Nodular	10	32.3
Superficial multicentric	7	22.6
Micro nodular	4	12.9
Infiltrative	4	12.9
Adenoid	3	9.7
Desmoplastic	2	6.5
Basosquamous	1	3.2

After reviewing the all histological types, we found that the commonest histological variant is nodular type (32.5%) followed by superficial multicentric (22.6%), micronodular (12.9%), infiltrative (12.9%), adenoid (9.7%), desmoplastic (6.5%) and basosquamous (3.2%).

Table IV: Type of histology according to age group (N=31)

	Age (years)					
	30 – 39(%)	40 – 49(%)	50 – 59(%)	60 – 69(%)	70 – 79(%)	≥80(%)
Nodular	1 (33.3)	1 (33.3)	3 (33.3)	4 (36.4)	0 (0.0)	1 (50.0)
Superficial multicentric	1 (33.3)	0 (0.0)	3 (33.3)	2 (18.2)	1 (33.3)	0 (0.0)
Micro nodular	0 (0.0)	1 (33.3)	2 (22.2)	0 (0.0)	1 (33.3)	0 (0.0)
Infiltrative	1 (33.3)	1 (33.3)	1 (11.1)	1 (9.1)	0 (0.0)	0 (0.0)
Adenoid	0 (0.0)	0 (0.0)	0 (0.0)	1 (9.1)	1 (33.3)	1 (50.0)
Desmopalstic	0 (0.0)	0 (0.0)	0 (0.0)	2 (18.2)	0 (0.0)	0 (0.0)
Basosquamous	0 (0.0)	0 (0.0)	0 (0.0)	1 (9.1)	0 (0.0)	0 (0.0)

Out of these 31 cases, we found 4 (36.4%) cases of nodular type were in the 6th decade, 3 (33.3%) cases of superficial multicentric type were in the 5th decade, and 2 (22.2%) cases of micronodular type were in the 5th decade.

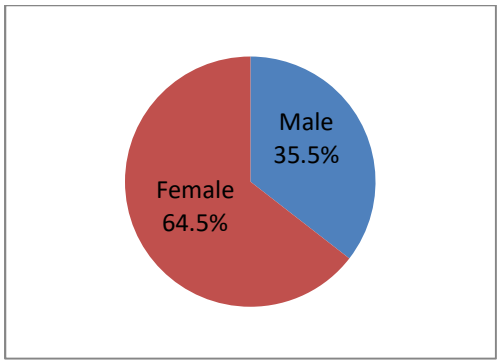

Figure 1 shows that 11(35.5%) patients were male whereas 20 (64.5%) patients were female out of total 31 patients.

Figure 1. Distribution of the patients according to gender (N=31)

Table V: Type of histology according to gender (N=31)

Histology type	Male (%)	Female (%)
Nodular	4 (36.4)	6 (30.0)
Superficial multicentric	3 (27.3)	4 (20.0)
Micro nodular	1 (9.1)	3 (15.0)
Infiltrative	0 (0.0)	4 (20.0)
Adenoid	2 (18.2)	1 (5.0)
Desmoplstic	1 (9.1)	1 (5.0)
Basoquamous	0 (0.0)	1 (5.0)

In females, 6 (30.0%) cases were nodular type, followed by 4 (20.0%) cases of superficial multicentric and 4 (20.0%) cases of infiltrative type. In contrast, in male patients, we found that nodular type of cases were 4 (36.4%), superficial multicentric were 3 (27.3%) and adenoid type were 2 (18.2%).

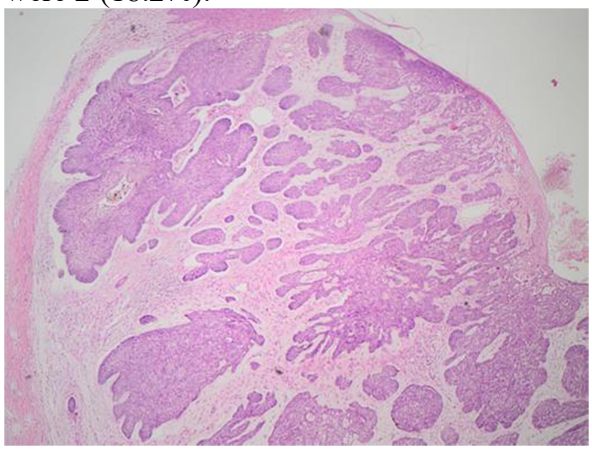

Figure 2. Nodular variant of BCC, Histopathology section, (H & E stain), 40x

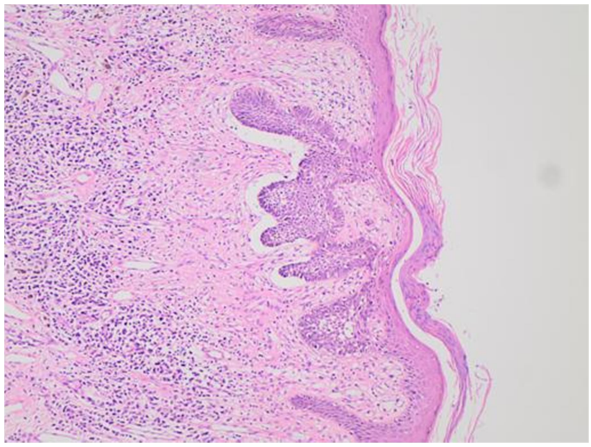

Figure 3. Superficial multicentric variant of BCC, Histopathology section, (H & E stain), 100x

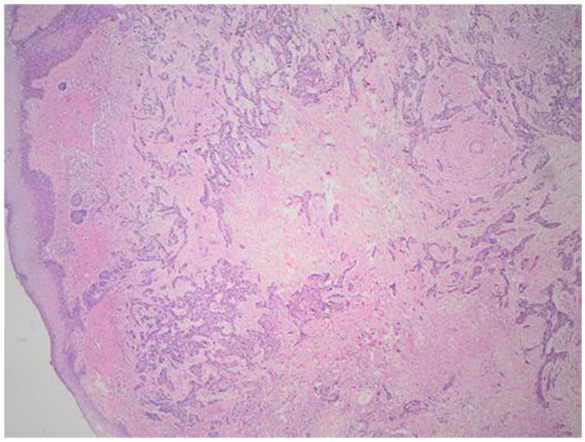

Figure 4. Infiltrative variant of BCC, Histopathology section, (H & E stain), 100x

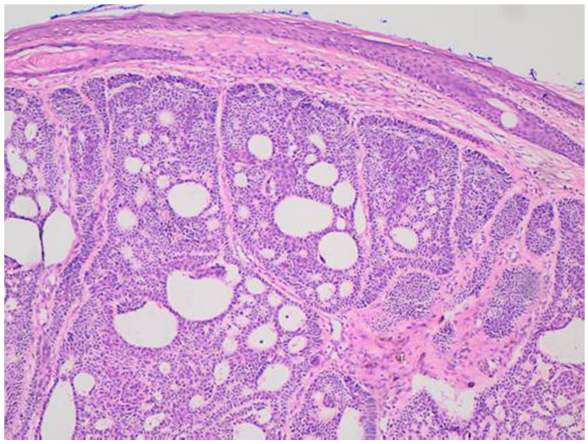

Figure 5. Adenoid of BCC, Histopathology section, (H & E stain), 100x

Discussion

Basal cell carcinoma is one of the most common malignant neoplasms in humans. Despite slow progression and infrequent metastasis, local destruction and recurrence could be noticed if appropriate treatment is not given. But its incidence rate has been increasing for the last few decades. In spite of the increasing rate in Bangladesh, studies regarding BCC is not much available. As the prognosis of histological variants of BCC is different from each other, it is important to know the demographic characteristics of each variant.

In this study, a total of 31 histologically diagnosed BCC were included. After examining each case of BCC, we found seven different variants of BCC during this study period.

Most of the patients were in the 6th decade, and the mean age of the patients was 64.5 years. Scrienver et al[13] noted that the average age was 65 years, which is comparable to our study. This study also found that a higher proportion of nodular type was seen in the 6th decade (36.4%) with superficial multicentric type more seen in the 5th decade (33.3%), which are also a similar finding to Scrivener et al.[13]

In the present study, most of the lesions (93.5%) were present on the head and neck region, which is similar to findings of Solanki et al[14] (94%), Chakravorthy et al[15] 90%, and Budhraja et al[16] 78%..

In our study, to male-to-female ratio in the patients of BCC was 1.1:2. But Solanki et al[14] noted a male-to-female ratio of 1.26:1. More female participants during this study period may be the cause of the increased female ratio. But Leslie et al[17] found more patients with BCC in females than males in his study.

In our study, the nodular type of BCC was the most common type, which was comparable with Solanki et al.[14]

In the present study, the nodular type of BCC was more common among female patients. But Christopher et al[18] found that the superficial multicentric variant of BCC is more common in female patients.

Limitations of the study

The limitation of the study is that it was conducted in a short period with a small sample size. A long-term study in a large number of patients will give more accurate results.

Conclusion

BCC is a relatively frequent disease that is regularly diagnosed at outpatient practice. Although increasing, proper study of BCC variants is not been done yet. In this study, most of the patients of BCC were in the 6th decade, in the head and neck region, mostly were female patients, and the nodular variant was the common type of BCC. Each variant of BCC differs in clinical presentation, morphology, and clinical behavior. Due to high incidence, these variants of BCC would be helpful in the appropriate treatment and future prognosis of the tumour.

Conflict of interest: There is no conflict of interest.

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