Original Article

Basal Cell Carcinoma

Clinicopathological Characteristics of Basal Cell Carcinoma of the Head and Neck in Tertiary Care Hospital in Rawalpindi, Pakistan

Maria Ilyas[1], Misbah Ali[1], Batool[2], Farah Farhan[2] and Ayesha Naveed[1]

ABSTRACT

Objective: Clinicopathological Characteristics of Basal Cell Carcinoma of the Head and Neck in Tertiary Care Hospital in Rawalpindi, Pakistan.

Study Design: Randomized control trial study.

Place and Duration of Study: This study was conducted at the Armed Forces Institute of Pathology, Rawalpindi (AFIP) from January 2016 to June 2016.

Materials and Methods: Clinicopathological analysis is done using H and E staining technique. A sample of 114 patients were selected. Cases were recuperated from the Data on age, gender, location of tumor and histopathological variant was collected and analyzed using SPSS version.

Results: BCC is common in males above 50 years of age comprising M: F ratio of 2.5:1 with nose been the most common anatomical site followed by the eye. Most common histopathological subtype include nodular variant followed by adenoid variant.

Conclusion: Nose been the most common clinical site instituted along with nodular variant as most common histopathological subtype of BCC in head and neck region.

Key Words: BCC, Malignancy, site, variant, morbidity

Citation of article: Ilyas M, Ali M, Batool, Farhan F, Naveed A. Clinicopathological Characteristics of Basal Cell Carcinoma of the Head and Neck in Tertiary Care Hospital in Rawalpindi, Pakistan. Med Forum 2020;31(10):56-60.

INTRODUCTION

Basal Cell carcinoma is commonest malignant tumor found locally destructive in nature with no metastasis but considerable morbidity. Major contributing factors include Sunlight and UV exposure. Certain international studies on BCC statistics, with less emphasis at national level is witnessed.

Early in the nineteenth century in 1827,term "rodent ulcer" was used initially by Jacob Arthur ,later known as BCC[1]. It is the commonest cancer affecting humans[2]. Its incidence is rising and it will exceed all other tumors in some years[3]. BCC comes under the umbrella of NMSC and account for 75-80% of NMSCs[4,5].

It has varying incidence according to different geographical location. The incidence of BCC patients in UK and Australia ranges between 18% and 40%.

[1.] Department of Oral Pathology, Margalla Institute of Health Sciences, Rawalpindi.

[2.] Department of Periodontology, Fauji Foundation Dental College, Rawalpindi.

Correspondence: Misbah Ali, Assistant Professor of Oral Pathology, Margalla Institute of Health Sciences, Rawalpindi.
Contact No: 0333-5252331
Email: misbah_ali23@yahoo.com

Received: March, 2020
Accepted: July, 2020
Printed: October, 2020

In North America the incidence of BCC is increasing at a rate of 10 % resulting in lifetime risk of 30% of developing BCC[7].

According to another Australian study done in the year 2002 the incidence of BCC is (male/female) 1041/ 1745 per 100 000 per year[8]. In Queensland, Australia the incidence of BCC is 2000 per 100,000 population[9].

In United Kingdom 75000 new cases of BCC are annually diagnosed with increasing incidence by year 2040. As BCC cases are not entered in the skin cancer registries in UK, their incidence is still miscalculated[10].

In South Wales the incidence is recorded to be 114.2 per 100000 population. In Minnesota, USA it is reported to be 146 per 100,000 population[7].

According to a study in our setup at AFIP Rawalpindi, Pakistan, 7.2% of the cases reported were skin cancers and 33% out of these were BCC[11]. Another study from Pakistan reported that skin malignancies comprised of 1.04% cases out of which 40 % cases were BCC[12].

Exposure to ultraviolet radiation during childhood is a significant factor in development of BCC. Adult exposure to ultraviolet radiation does not seem to have the same impact as in younger ages. Intermittent sunlight exposure as compared to continuous exposure has much more importance in development of BCC. Wavelengths of 293, 354 and 380 nm of UV have been linked to its pathogenesis. Development of malignant melanoma and NMSCs is linked with 2 vitamin D polymorphism. Patients on immunosuppressive therapy are also more prone to the development of BCC as well

as SCC. Xeroderma pigmentosum, Gorlin syndrome, Rasmussen Syndrome, Rombo syndrome, and albinism are allied to augment risk factor of SCC. Gorlin syndrome or the nevoid BCC syndrome is caused by mutation in PTCH gene the Hedge Hog pathway[13].

The incidence of BCC increases with age and it is commonly diagnosed after 40 years of age[6]. According to WHO, the incidence of BCC is greater in older age groups, with higher frequency in men than women. However In younger age group,there is greater incidence in women than men due to the use of indoor tanning and smoking[9].

It has been documented that BCC is slightly more common in Pakistani males as compared to females. The M: F ratio ranging from 1.2-1.4:1[14,15].

Most common sites for BCC in Pakistani population is head and neck (93.5%), particularly nose, forehead, periocular areas and cheek among which nose and cheek been the most common sites[15].

Basal cell carcinoma is defined as locally destructive slow epidermal tumor. Histologically, BCC is characterized by proliferating strands of uniform, hyperchromatic basophilic cells with scant cytoplasm and oval nuclei. The islands and cords have peripheral palisading that looks similar to the basal layer of the epidermis[14] . WHO defines basal cell carcinoma as "A group of malignant cutaneous tumors characterized by the presence of lobules, columns, bands or cords of basaloid cells (germinative cells)".

BCC is classified into different variants. The common morphological feature present between these variant is the presence of lobules, columns, bands and cords of basaloid cells characterized by a scant cytoplasm, loose fibromucinous stroma and retraction artifacts. The retraction artifacts arise due to the lack of hemidesmosomes that attaches the overlying epidermis to the underlying dermis.

Nodular Basal Cell Carcinoma([9]): It consists of well demarcated lobules and nests of basaloid cells that seem to originate from the basal / germinative layer of the overlying epidermis reach up to the reticular layer of the dermis. The basaloid epithelial cells of the nests and strands show peripheral palisading. Cleft like spaces called retraction artifacts are seen between the tumor nests and the surrounding adjacent connective tissue.

Superficial BCC([9]): It is a tumor which consists of nests of basaloid cells which project from the epidermis and extend up to the papillary layer of the dermis.

Micronodular Basal Cell Carcinoma([9]): It comprises of small nodules that seem to be separated by normal collagen in between them. Associated with perineural invasion most of the time.

Infiltrating Basal Cell Carcinoma([9]): It consists of very fine thin strands, cord like arrangement of basaloid (germinative) cells that infiltrate between the collagen bundles into the underlying dermis. This variant usually does not show peripheral palisading and artifactual retraction.

Fibroepithelial Basal Cell Carcinoma([9]): It consists of interconnecting network of cords and strands of basaloid cells that extend downwards from the overlying epidermis. These strands of germinative cells are surrounded by fibrous stroma containing blood vessels with indolent clinical course.

Basal Cell Carcinoma with adnexal differentiation ([9]): It is composed of BCC with the presence of adnexal differentiation. It may have trichilememal, sebaceous, ductal and follicular elements. Sometimes eccrine and apocrine differentiation is also seen in this variant.

Basosquamous Carcinoma([9]): The presence of BCC with histopathological features of SCC was first hypothesized in the year 1922. They represent a continuum which extends from a BCC at one and SCC at the other end [16]. This aggressive variant is characterized by a BCC with squamous differentiation. The epithelial cells have higher degree of keratinization. Peripheral palisading is lost in some areas and the cells tend to have a vesicular chromatin and varying degrees of pleomorphic can be seen. It has a tendency to metastasize unlike a typical BCC which is locally destructive.

Keratotic Basal Cell Carcinoma ([9]): This variant has the typical features of a nodular BCC which is composed of basaloid tumor cells with deeply stained basophilic nucleus, scant cytoplasm, peripheral palisading and retraction artifacts, along with horn cysts in between the tumor nests.

MATERIALS AND METHODS

Data of all the malignant skin tumors was retrieved from the records during January and June 2016 and only BCC in head and neck were included in the study. Hematoxylin and Eosin slides were prepared, diagnosis and reconfirmed in consultation with a senior pathologist. The clinical data was obtained from record files of Histopathology Department of Armed Institute of Pathology. Data such as age, gender, anatomical location and histopathological variant was collected. The BCC cases included different variants of BCC classified according to WHO Fascicle of Skin Tumors. Variables (quantitative) such as age mean ± SD was calculated. Variables (qualitative) such as gender, site of biopsy, histopathological variant, frequency and percentages were calculated.

RESULTS

From the results following observations were made. According to the 114 studied BCC cases the mean age calculated was 63.18 ± 14.41 years with a minimum age of 33 and maximum age of 86 years. 33 (28.94%) out of 114 cases were in range of 33 to 50 years and the remainder cases 81(71.05%) were above 50 years shown in figure 1. Among these cases female patients

are 33 (28.94%) whereas 81 (71.05 %) were male with ratio of male to female is 2.5:1. Out of the 114 cases patients, 72 (63.16%) cases of BCC were Nodular variant, 18 (15.79 %) Adenoid variant, 12 cases (10.53%) Infiltrating variant, 6 case (5.26%), Micro nodular variant, 3(2.63%) Fibro epithelial variant and 3 (2.63%) Pigmented variant shown in figure 3. Highest proportion of tumors was on the nose among total 114 cases that is 51 out of 114 (44.74%). Another common site eye having 27 (23.68 %) cases. Cheek comprises 18 (15.79%) cases and neck, scalp and forehead comprises the remainder 15 (13.16%) illustrated in figure 2.

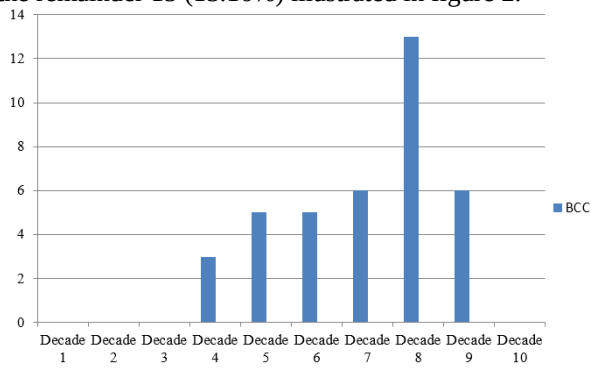

Figure No.1: Age Distribution of BCC cases (n=38)

Site of Basal Cell Carcinoma

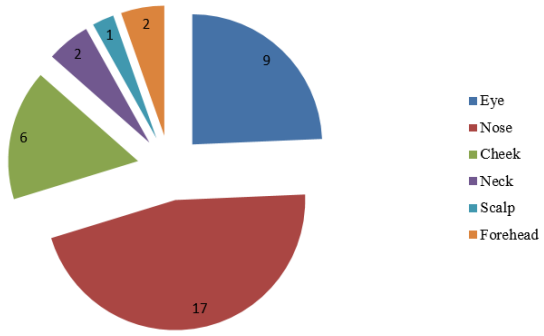

Figure No.2: Site distribution - Basal Cell Carcinoma (n=38)

Variants BCC

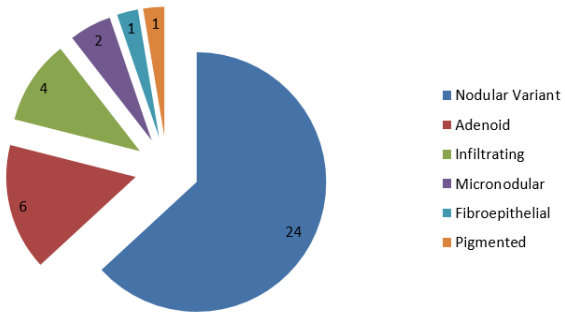

Figure No. 3: Variants of BCC (n=38)

DISCUSSION

Basal Cell Carcinoma is non melanoma skin cancer with increasing incidence globally due to increased ultraviolet exposure and the depletion of ozone layer in certain areas because of pollution and environmental hazards. Ultraviolet radiation causes damage to DNA leading to subsequently development of BCC. Immunosuppressed and transplant patients are more likely to develop BCC .BCC development is also seen in Nevoid Basal Cell Carcinoma Syndrome, Rasmussen syndrome, Darier's disease, Bazex syndrome and Rombo syndrome as they share the same Sonic Hedgehog pathway Mutation genetic mutation[11].

Although, BCC is an indolent tumor and does not metastasize but it is the most common non melanoma skin cancer and causes considerable local destruction and morbidity and is a huge financial burden on the economy.

In present study, BCC has a prediction towards elders. 63.18 ± 14.41 years is mean age. >50 years comprises 71.05% cases. Age range between 33 to 50yrs comprises 28.94% cases, first 3 decades of life comprises nil cases. 8th decade of life comprises peak incidence. In another study done in our institute by Asif et al[15] the mean age of patients with BCC was 60.04 years and two third of the patients were from the sixth decade of life. Peak prevalence was seen in the seventh and eight decade of life. Wehshah et al[17] also reported the tumor to be the most frequent in age group between 60-69 years. The trend of BCC in older age could be atrributed to the decreased regenerative and corrected potential of the DNA to correct the genetic damage caused by ultraviolet sun radiations.

According to our study the majority of patients with BCC were male 71.05%, as compared to female 28.94%. The male to female ratio is 2.5: 1 the .Similar trend is seen in a study by Asif et al in which males account for 53.2% cases with 1.2:1 ratio of male to female[18]. The male predilection for BCC is most likely linked to their outdoor occupations and subsequent increased UV light exposure as compared to females in our part of the globe.

After analysis for the anatomical site for occurrence of BCC, it was found out that nose is the most common site accounting for 44.74%. Eyes being 2nd common site with 23.68% cases. 15.79 % cases from cheek with neck, scalp and forehead consisting of 13.16% case. Similar trend is seen in a study by Asif et al in which common site in head and neck comprise of nose and cheek[18]. Janjua et al carried out an analysis on 171 cases of BCC in the head which they reported that the nose was the most anatomical common site for BCC in this region and accounted for 31.5 % of their total cases. According to their results second most common location was the cheek accounting for 26.9% of their cases[11]. Afridi et al also observed that the nose was the

most common site for BCC (45.9%) followed by periocular (28%) and cheek (15.6%). Results from other Asian countries are also similar to my results[19-20] and support my finding for the nose being most common BCC site.

The information about the lesion size was also collected and analyzed. It was found out at that at the time of presentation most of the lesions ranged between 0.2-to 9cm. The mean size at the time of presentation was 20mm.In an Italian study Cigna et al reported mean size of lesion at the time presentation to be 12mm which is smaller than our study[21] In third world developing countries like Pakistan, late presentation is a common finding due to lack of a preventive public awareness programs which results in considerable morbidity and huge financial burden on the patient.

Histopathological pattern of the tumor was analyzed and assessed in our study and in this regard nodular variant is the most common histopathological subtype of BCC in the head and neck region accounting for 63.13% cases followed by adenoid variant accounting for 15.79% .Similar trend is seen in a study by Gundalli et al[22] and McGuire et al([23]) in which nodular variant has been reported as the most common histo-pathological subtype of BCC in the head and neck region[23]. Aandani and Ganatra[24] and Cigna et al[21] in their respective studies have supported the similar trend.

CONCLUSION

BCC is fairly common malignant skin tumor in our society. BCC is common in older age group above 50 years and is uncommon in younger age. Nose is the most common site followed by the eye. BCC is more common in males than females more likely due to outdoor sun exposure. Nodular variant followed by the adenoid variant are the two most common histopathological subtypes in the head and neck region.

Acknowledgement: The authors acknowledge the contribution of Mohammad Hanif, lab technician at AFIP for helping in data collection and record keeping.

Author's Contribution:

Concept & Design of Study:	Maria Ilyas
Drafting:	Misbah Ali, Batool,
Data Analysis:	Farah Farhan, Ayesha Naveed
Revisiting Critically:	Maria Ilyas, Misbah
Final Approval of version:	Maria Ilyas

Conflict of Interest: The study has no conflict of interest to declare by any author.

REFERENCES

1. Malik V, Goh KS, Leong S, Tan A, Downey D, O'Donovan D. Risk and outcome analysis of 1832 consecutively excised basal cell carcinomas in a tertiary referral plastic surgery unit. J Plastic Reconstructive & Aesthetic Surg: JPRAS 2010; 63(12):2057-63.
2. Camp WL, J.W. T, Athar M, Elmets CA. New agents for prevention of ultraviolet-induced nonmelanoma skin cancer. Seminars in cutaneous Med Surg 2011;30(1):6-13.
3. Madan V, Lear JT, Szeimies RM. Non-melanoma skin cancer. Lancet 2010;375(9715):673-85.
4. Katalinic A, Kunze U, Schafer T. Epidemiology of cutanoeus melanoma and non-melanoma skin cancer in Schleswig-Holstein, Germany: incidence, clinical subtypes, tumour stages and localization (epidemiology of skin cancer). Bri J Dermatol 2003;149(6):1200.
5. Rubin AI, Chen EH, Ratner D. Basal cell carcinoma. N Engl J Med 2005;353(21):2262-9.
6. Baxter JM, Patel AN, Varma S. Facial basal cell carcinoma. BMJ 2012;345.
7. Wong CSM, Strange RC, Lear JT. Basal cell carcinoma. BMJ 2003;327(7418):794-8.
8. Staples MP, Elwood M, Burton RC, Williams JL, Marks R, Giles GG. Non-melanoma skin cancer in Australia: the 2002 national survey and trends since 1985. Med J 2006;184(1):6-10.
9. LeBoit PE, Burg G, Weedon D, Sarasin A, editors. Pathology and Genetics of Skin Tumors. Lyon: IARC; 2006.
10. Diffey BL, A. LJA. Skin cancer incidence and ageing population. Bri J Dermatol 2005;153(3): 679-80.
11. Janjua OS, Qureshi SM. Basal cell carcinoma of the head and neck region: an analysis of 171 cases. J Skin Cancer 2012.
12. Ahmed A, Alam MB, Khan W, Badar A, Shah SH. Frequency and characterstics of skin cancers diagnosed at Ayub Medical College Abottabad Pakistan from 1995-2003. J Ayub Med Coll Abbotabad 2007;19(4):3-6.
13. Ricotti C, Bouzari N, Agadi A, Cockerell C. Malignant skin neoplasms. Med Clin N Am 2009 28-9-2016; 3:1241-64.
14. Janjua OS, Qureshi SM. Basal Cell Carcinoma of the Head and Neck Region: An Analysis of 171 Cases. J Skin Cancer 2012.
15. Asif M, Mamoon N, Ali Z, Akhtar F. Epidemiological and excision margin status of Basal cell carcinoma--three years Armed Forces Institute of Pathology experience in Pakistan. Asian Pacific J Cancer Prevention: APJCP 2010; 11(5):1421-3.
16. Hussain SI, Hussainy A. Baso-Squamous Cell Carcinoma - a Case Report. JPMA; J Pak Med Assoc 2004;54(1):30-3.
17. Weshah S, Smadi R, Helalat M. Basal cell carcinomas: a retrospective analysis of 76 patients. Pak J Med Sci 2007;23(4):556-60.

18. Asif M, Mamoon N, Ali Z, Akhtar F. Epidemiological and excision margin status of basal cell carcinoma—three years armed forces institute of pathology experience in Pakistan. Asian Pacific J Cancer Prev 2010;11(5):1421-3.
19. Marks R. The epidemiology of non-melanoma skin cancer: who, why,and what can be done about it . J Dermatological Case Reports 1995;22(11):853-7.
20. Levi F, Vecchia C, Te V. Descriptive epidemiology of skin cancer in the Swiss Canton of Vaud. Int J Cancer J Int du cancer 1988;42(6): 811-6.
21. Cigna E, Tarallo M, Maruccia M, Sorvillo V, Pollastrini A, Scuderi N. Basal cell carcinoma: 10 years of experience. J Skin Cancer 2011.
22. Gundalli S, Kolekar R, Kolekar A, Nandurkar V, Pai K, Nandurkar S. Study of basal cel carcinoma and its histopathological variants. Our Dermatol Online 2015;6(4):399.
23. McGuire JF, Norman NG, Dyson S. Nonmelanoma skin cancer of the head and neck I: histopathology and clinical behavior. Am J Otolaryngol 2009; 30(2):121-33.
24. Aandani A, Ganatra A. Incidence of basal cell carcinoma at plastic surgery department of tertiary care hospital in Karachi. J Surg Pak 2011;27: 117-20.