



## Determining the Demographic and Histopathological Pattern of Basal Cell Carcinoma in the Pathology Laboratories of Babol University of Medical Sciences from 2013 to 2020

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| Article Type   | ABSTRACT                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
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| Research Paper | <p><b>Background and Objective:</b> Basal cell carcinoma is the most common human malignancy that has been increasing in recent years. The aim of this study is to determine the demographic and histopathological pattern of this malignancy in the pathology departments of state hospitals in Babol from 2013 to 2020.</p> <p><b>Methods:</b> In this retrospective study, after reviewing the existing files with the final diagnosis of basal cell carcinoma from 2013 to 2020, the patients' information including age, gender, lesion location and microscopic subgroup were recorded and analyzed.</p> <p><b>Findings:</b> In this study, 367 cases were obtained from Shahid Beheshti and Shahid Yahyanejad Hospitals in Babol with the diagnosis of basal cell carcinoma. The mean age of people in both genders was <math>67 \pm 10.89</math> years. 69% of the samples were men and 31% were women (<math>p &lt; 0.001</math>). The highest frequency was from the scalp area (134 samples) and the lowest frequency was related to the chest (3 samples). The most common histopathology subtype was nodular type and the rarest types were metatypical and clear cell carcinoma. A statistically significant relationship was observed between the location of the sample and gender (<math>p = 0.023</math>); the cheek in men and the nose in women were more common than the other gender. The highest incidence was seen in 2017 with 83 cases, which was a significant increase compared to the previous year.</p> <p><b>Conclusion:</b> Based on the results of this study, the high incidence of basal cell carcinoma in the head and face area of elderly people, especially men, reveals the need to inform high-risk communities and to be more familiar with therapists, especially dentists who are in close eye contact with the face.</p> <p><b>Keywords:</b> <i>Basal Cell Carcinoma, Demography, Pathology.</i></p> |

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## Introduction

Skin cancers are the most common human malignancies worldwide, and among them, basal cell carcinoma accounts for about 75 to 80% of cases (1). This tumor is a primary epithelial malignancy with local invasion and slow growth, which is most commonly seen in the scalp and neck. The global incidence of this carcinoma is different in different regions and its characteristics are influenced by environmental and host factors (2-4). According to previous studies, the incidence of basal cell carcinoma appears to be lower in Asian races such as the people in India and China compared to white Europeans and Australians. Sun rays are known as the most important risk factor for this lesion, and its higher prevalence in residents near the equator confirms this. Sunburn, especially in the early and middle years of life, can play a role in increasing the incidence of basal cell carcinoma. Furthermore, among human cancers, the highest rate of gene mutation has been reported in this malignancy. In addition, in recent studies, other effective factors such as diet have been mentioned in association with this disease. It is said that diets containing more fruits and vegetables and less meat and fat are effective in reducing the incidence of skin cancers (5). The use of compounds containing caffeine exerts its antiproliferative effect by inducing apoptosis in keratinocytes damaged by sunlight, and its consumption is associated with a reduction in the risk of basal cell carcinoma (1). In a recent cohort study, a positive relationship between the consumption of citrus fruits and the incidence of basal cell carcinoma was also reported, and the higher absorption of ultraviolet rays by citrus products is considered to be the cause of this relationship (6).

According to the results of the vast majority of studies, basal cell carcinoma mainly involves the head, face and neck area, while the most common area in various articles being reported to be the nose (7-10).

Different clinical types of basal cell carcinoma have been reported, the most common of which is the nodular or ulcerated nodular type (7, 9, 11). Despite the fact that there is no comprehensive consensus on the histopathology classification of basal cell carcinoma, its common types have been reported as nodular, superficial, morpohic and fibroepithelial in different sources (10, 13, 12).

Various treatment methods have been proposed for basal cell carcinoma, and usually patients prefer a method that has less recurrence and lower cost and provides the desired aesthetics (14).

Several articles have reported that the prevalence of skin cancer in the Iranian population has increased (15, 16) and since skin cancers cause functional and aesthetic complications (11, 17), it is necessary for the health and treatment system to pay attention to this issue.

The aim of this research is to determine the demographic and histopathological pattern of basal cell carcinoma in the samples reported in state hospitals in Babol from 2013 to 2020 and compare it with similar studies in this area.

## Methods

After approval by the ethics committee of Babol University of Medical Sciences with ethics code IR.MUBABOL.HRI.REC.1400.122, this cross-sectional study was conducted at the Oral Health Research Center of the Faculty of Dentistry of Babol University of Medical Sciences. In this study, a total of 52024 cases referred to the Anatomical Pathology Department of Shahid Yahyanejad and Shahid Beheshti Hospitals in Babol from 2013 to 2020 were examined and the cases with a definitive diagnosis of basal cell carcinoma were identified. The samples were prepared by punch and excisional biopsies. By examining the names of patients and repeating, common cases were considered as one sample. Demographic characteristics of patients including age, gender, and admission date, location of lesion, final diagnosis and

histopathology subgroup were collected from the above files using the designed information registration form. Data were analyzed with SPSS statistical software and  $\chi^2$ , T-test and ANOVA, and  $p < 0.05$  was considered significant.

## Results

In this study, after examining 52024 cases in the archive of teaching hospitals of Babol, 367 cases were found in the two hospitals of Shahid Beheshti (175 samples [47.7%]) and Shahid Yahyanejad (192 samples [52.3%]) in Babol with final diagnosis of basal cell carcinoma (0.7%). Of these, 252 cases were related to men (68.7%) and 115 cases were related to women (31.3%) ( $p < 0.001$ ). The samples were respectively 4 (1.1%), 26 (7.1%), 59 (16%), 55 (15%), 81 (22.1%), 54 (14.7%), 45 (12.3%) and 43 (11.7%) from 2013 to 2020. The number of samples during these years based on gender is shown in Figure 1.

The mean age of people was  $67 \pm 10.89$  years with a minimum of 27 and a maximum of 93 years. The mean age of women was  $65.83 \pm 11.54$  years and the mean age of men was  $67.4 \pm 10.57$  years ( $p = 0.202$ ), and this age difference in men and women was not significant.

The largest number of examined samples were from the scalp area (134 samples [36.5%]), followed by the nose and forehead, and the lowest number was from the chest (3 samples [0.8%]) (Figure 2). The number of cheek samples was significantly higher in men than in women, and the number of nose samples was seen with a higher percentage in women ( $p = 0.023$ ).

The most observed histopathology subtype was nodular type (270 samples [73.6%]) and the least common were metatypical and clear cell types, each (1 sample [0.3%]). More than one histopathological plan was observed in 97 samples (26.4%) (Figure 3). In addition, out of 97 samples that had more than one histopathological type, the most frequent were a combination of nodular and adenoid in 31 cases (8.4%).

No significant statistical relationship was observed between the frequency of any of the types and gender. Furthermore, there was no statistically significant relationship between histopathological type and sample location or age.

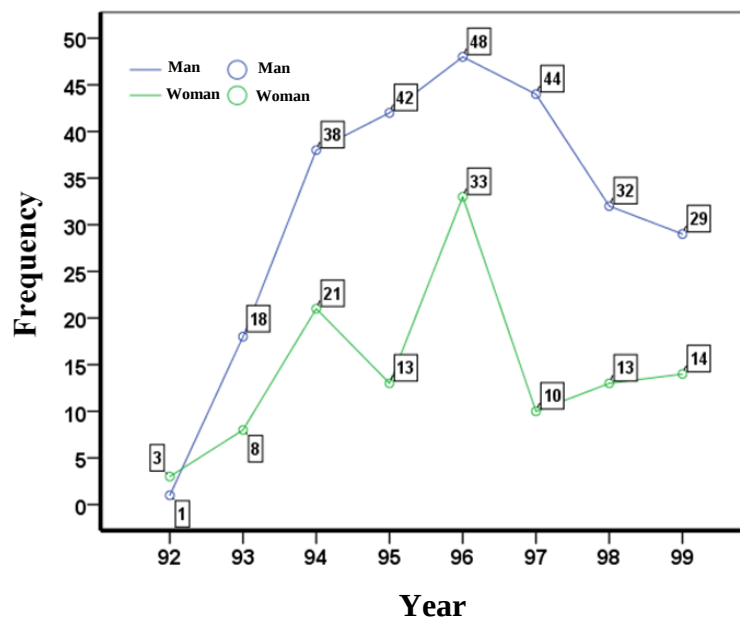


Figure 1. The number of samples submitted per year by gender

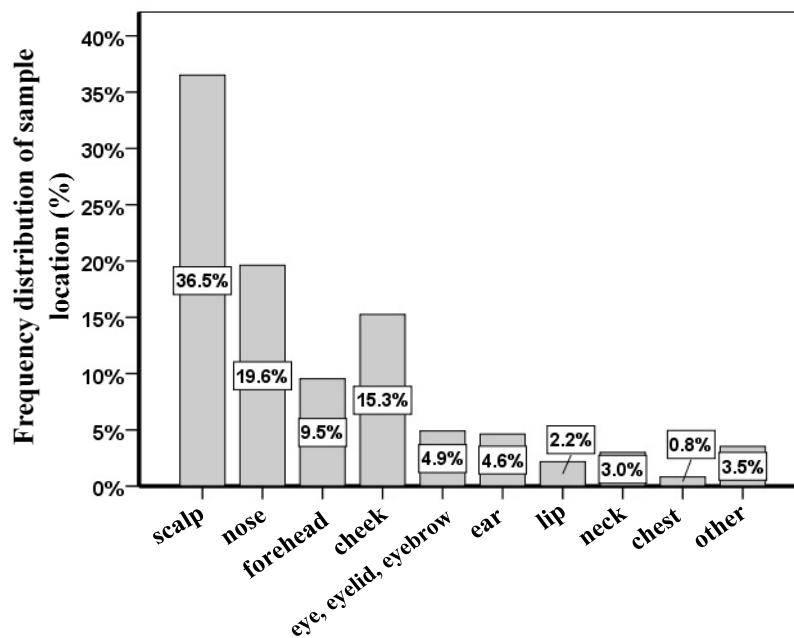


Figure 2. Frequency distribution of basal cell carcinoma lesions by sample location

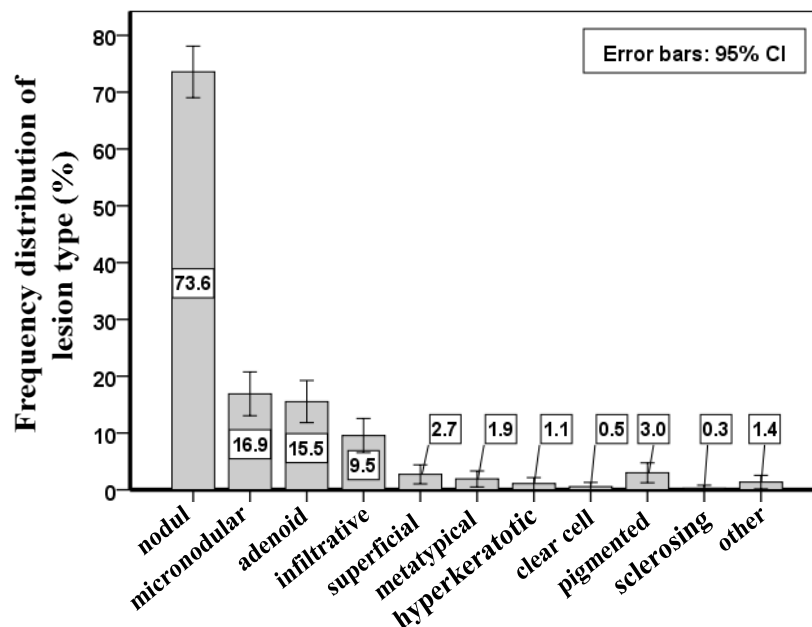


Figure 3. Frequency distribution of basal cell carcinoma lesions based on lesion type (combined types are reported separately)

## Discussion

In this study, the highest prevalence was found in the scalp of elderly men and mainly from the nodular histopathology subgroup. The mean age of affected people was  $67 \pm 10.89$  years, which was reported as 67 and 61 years respectively in previous studies conducted by Emadian et al. in Mazandaran and Valavi et al.

in Khuzestan. Since the study by Emadian was conducted in Mazandaran province, this similarity was expected, but in Khuzestan, the age of onset was lower, which could be due to the geographical region and direction of sunlight (18, 19). In addition, in the study of Flohil et al., which was conducted in the Netherlands, it was also shown that the prevalence of basal cell carcinoma in people over 65 years old was almost four times higher than others (20).

Some sources have reported the prevalence of this carcinoma in young women, which we did not encounter in our study (11); this issue may be related to the social differences in the society in our study and previous studies.

Therefore, according to these findings, it is necessary to pay more attention to the possibility of this malignancy in the periodical examinations of the elderly and to consider more accurate examinations for the early diagnosis of this lesion.

Another important finding in this study was that the prevalence of basal cell carcinoma was significantly higher in men than in women, which was consistent with previous studies conducted by other researchers (18, 19, 21-24). Considering this finding, as well as the higher prevalence of lesions at older ages and the high prevalence of skin cancers in elderly men, and since usually in different societies, elderly men pay less attention to their health, it is necessary to have sufficient knowledge about the possibility of this disease in high risk groups.

Regarding the most common location of involvement in the present study, the scalp had the higher frequency; after that, the nose and cheek were in the next rank, and the chest showed the least number of involved cases. In the study of Emadian et al., Lotfinejad et al. and Beheshtiroy et al., the head and face were the most common areas involved (23, 22, 18) and also in the study of Devine et al., the head and neck with preference for cheek, nose and forehead were introduced as the most common areas of basal cell carcinoma involvement, which was consistent with our results (24). According to these results, protection of facial skin with sunscreen creams can be recommended to all people, especially older people, and in order to prevent lesions on the scalp, the use of hats, especially during activities in open spaces, e.g. when farming, should be strongly recommended to people.

Since the samples in the area of the face mask have a higher recurrence rate (11), the clinician should be aware of this and give the necessary warnings to the patients.

Regarding the comparison of the two genders in the affected areas, it was seen that scalp is the most common in both genders. Of course, the percentage of involvement in men was higher than that of women, which can be justified by the fact that women cover their head more than men. Nose involvement was more in women than men and the percentage of cheek involvement in men was significantly higher than women. Due to the fact that in other similar studies, the involved locations were not investigated based on gender, it was not possible to compare the present study with previous texts, but this issue can be further investigated in future researches.

Studies conducted in different regions show an upward trend in the number of samples diagnosed with basal cell carcinoma (18, 20-22, 24, 25), but in the samples we examined, the highest rate was in 2017, and after that, there was a downward trend. Since we only examined public hospitals, these samples cannot be valid for the whole society, and for a more detailed investigation and to understand whether the number of samples in the entire city is increasing or not, it is necessary to examine all the private sector laboratories as well.

Regarding the histopathological subtypes, the most common reported in all samples was the nodular type, followed by the micronodular and adenoid types. In other similar studies, different subtypes were not examined, but due to the high recurrence rate in micronodular, infiltrative and sclerosing types (11), it seems necessary for clinicians to pay more attention to the histopathology subtype.

The nodular type alone included more than half of all samples, and in combination with other samples, it was reported in 73% of the samples, which is similar to the studies of other colleagues in Iran and abroad (26, 27).

In general, considering the relatively high prevalence of this carcinoma in societies, the issue that early diagnosis and accurate and complete surgery can achieve a complete recovery for patients, and the need for the health and treatment staff to become more familiar with this lesion become apparent. Since dentists are the clinicians who are in direct eye-to-face contact with the facial skin, it is necessary for them to be careful enough about lesions that can be seen on different surfaces and to inform patients of any abnormal condition. Knowing the places that have a higher rate of prevalence and recurrence, as well as knowing the histopathology subgroups and their different prognoses can help the therapist in determining the number of periodical follow-ups and the level of patient education.

In this study, the high incidence of basal cell carcinoma in the head and face of elderly people, especially men, was reported, and these results indicate the need to inform high-risk groups and also to familiarize health and medical personnel, especially dentists, who are in close eye contact with the face.

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