Title: The effect of socio-economic status on severity of periocular basal cell carcinoma at presentation

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ABSTRACT

OBJECTIVE:

To evaluate the influence of socio-economic factors on size of periocular basal cell carcinoma (BCC) at presentation.

METHODS:

All periocular basal cell carcinoma (BCC) cases receiving treatment from the oculoplastics team in South Glasgow Hospitals NHS Trust, Glasgow between 1999 and 2009 were identified retrospectively. Information collected included demographic details of patients, side and site of lesions, type of lesions and size of lesions. The size of lesion is defined as small for any dimension not exceeding 5mm, medium for dimensions between 6mm-10mm and large for dimensions exceeding 11mm. Home address was used to determine the Scottish Index of Multiple Deprivation (SIMD) rank. The demographics, size of lesion and SIMD rank were investigated using the general linear regression modelling.

RESULTS:

Of the 67 cases, 24 were men and 43 were women. The mean age is 71.5 years old. There were a total of 67 cases being identified, of which 38 presented with small size lesions, 24 with medium size lesions and 5 with large size lesions. SIMD is related to the presenting incidence of BCC, with the lower ranks presenting more frequently. The significant difference exists between the small and medium categories. Note that there are only 5 in the large category which may account for the lack of significance statistically.

CONCLUSION:

Socio-economic deprivation is associated with larger and more frequent presentation of periocular BCC.

INTRODUCTION

Basal cell carcinoma (BCC) is the most common malignant tumour encountered and managed by ophthalmologists. It has a predilection for elderly fair skin people and often associated with a history of chronic sun exposure.[1,2]

BCC is a malignant skin condition, which rarely metastasises. However, it can still have devastating effect through local infiltration.[3] Rarely, more aggressive histological subtypes can still prove fatal. Therefore the type and size of lesion are factors that can influence outcome of BCC treatment.[4,5]

Here, we would like to evaluate and report the influence of socio-economic factors on size of periocular basal cell carcinoma (BCC) on presentation.

METHODS

All periocular basal cell carcinoma (BCC) cases receiving treatment from the oculoplastics team in South Glasgow Hospitals NHS Trust, Glasgow between 1999 and 2009 were identified retrospectively.

Information collected included demographic details of patients, side and site of lesions, type of lesions and size of lesions. The size of lesion is defined as small for any dimension not exceeding 5mm, medium for dimensions between 6mm-10mm and large for dimensions exceeding 11mm. Home address was used to determine the Scottish Index of Multiple Deprivation (SIMD) rank.

The SIMD 2006 was used to assess socio-economic status of the patients. It takes into account seven domains (Current Income, Employment, Health, Education Skills and Training, Geographic Access to Services, including public transport travel times, Housing and Crime Domain) in generating an SIMD score. The SIMD data are presented at data zone level with the postcode of each patient being allocated an SIMD score/rank. This was obtained by matching them to their data zones, taken from the website http://www.sns.gov.uk which relates them to their individual ranks from the SIMD 2006 website (http://www.scotland.gov.uk/SIMD2006Data).[6] The SIMD rank ranges from 1 to 6505, 1 being the most deprived. The demographics, size of lesion and SIMD rank were investigated using the general linear regression modelling.

RESULTS

Of the 67 cases, 24 were men and 43 were women. The mean age is 71.5 years old. There were a total of 67 cases being identified, of which 38 presented with small size lesions, 24 with medium size lesions and 5 with large size lesions. SIMD is related to the presenting incidence of BCC, with the lower ranks presenting more frequently.(Figure 1)

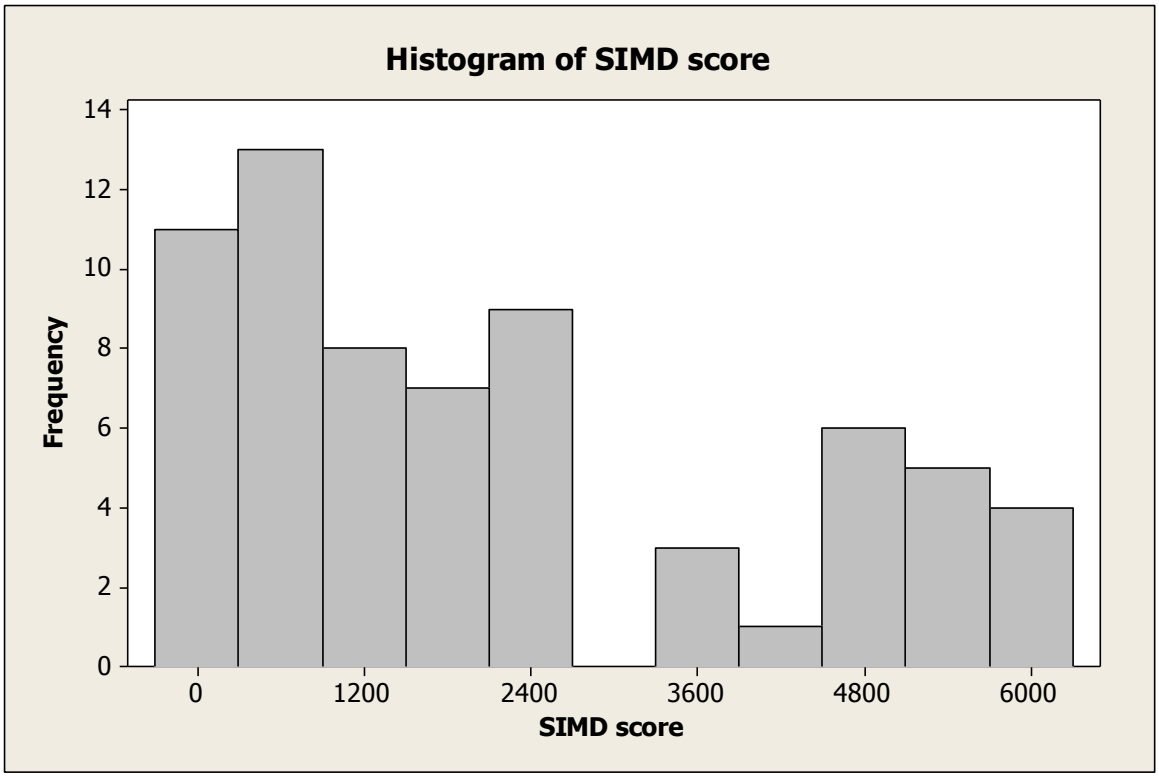

Figure 1 Histogram of SIMD score showing higher frequency of periocular BCC in the more deprived areas.

The significant difference exists between the small and medium categories. Note that there are only 5 in the large category which may account for the lack of significance statistically. (Figure 2)

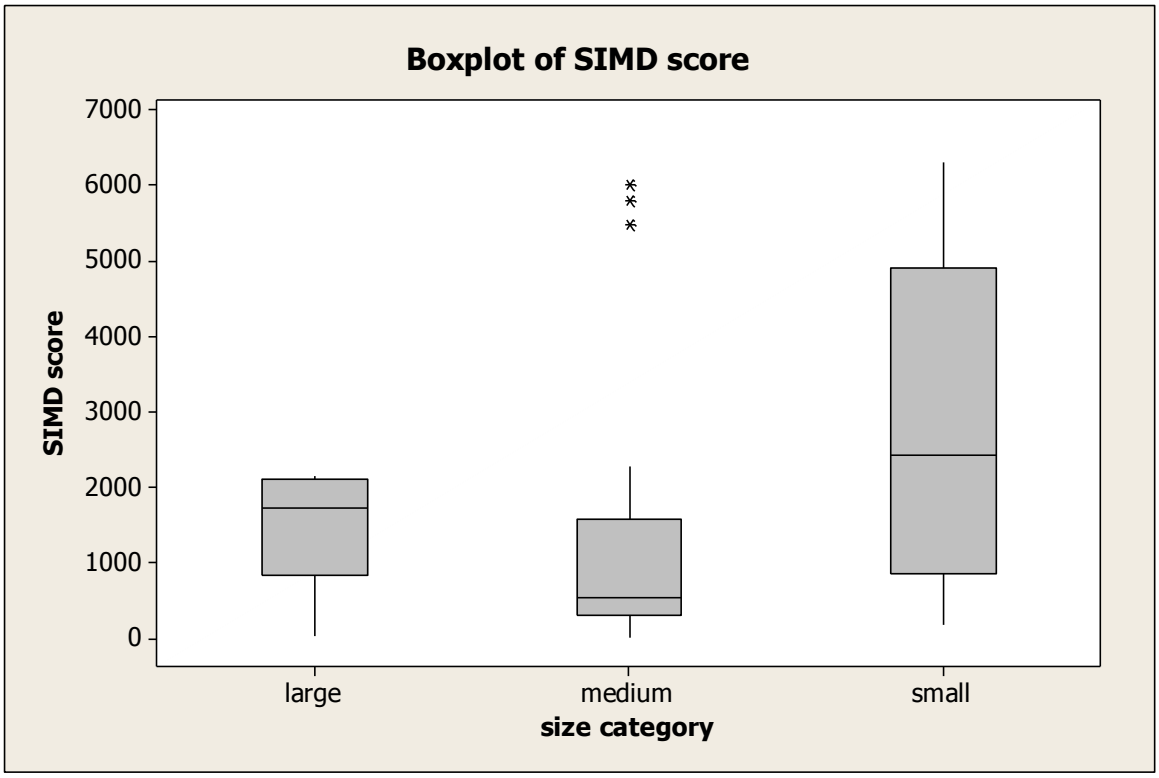

Figure 2 Boxplot of SIMD score showing that the size of periocular BCC is significantly directly linked to socio-economic status of patients.

Analyses were carried out using SPSS Version 15.0 (SPSS, Chicago) with p-values of <0.05 regarded as statistically significant.

Conclusion:

Socio-economic deprivation is associated with larger and more frequent presentation of periocular BCC.

DISCUSSION

There have been a few different types of scores utilised to gauge and classify socio-economic deprivation. These include SIMD, Townsend, Carstairs and Jarman. SIMD is a more accurate representation of the socio-economic status of a given group of population, taking into account a wider variety of indicators of deprivation (a total of 37), compared with Jarman (10), Townsend (4) and Carstairs (4).[7-9] The SIMD data involved data at zone level with a median population size of 769, allowing for small pockets of deprivation to be identified. This results in a broader more comprehensive picture of relative area of deprivation throughout Scotland. The SIMD had been used widely in studies of mortality, cardiovascular disease, community glaucoma and literacy of patients.[10-13]

Our study suggests that patients living in areas of socio-economic deprivation are more likely to have periocular BCC, and bigger BCC size at presentation to the Ophthalmology Department. Although there are no previous studies looking into the link between the size and frequency of periocular BCC and patients' socio-economic status, studies for other diseases like skin, breast and colorectal cancer had shown that late presentation are linked to lower socio-economic status.[14-16] Therefore it is not very surprising that our study of such link in periocular BCC is showing a similar trend.

Early presentation of small BCCs is usually easily managed with a good prognosis. Late presentation of periocular BCC may imply that surgical treatment will be more challenging, with less favourable cosmetic outcome in view of more extensive local

tissue involvement and destruction. Furthermore, local tissue invasion may often remain asymptomatic with no ocular signs. [17-19] Patients from the lower end of the socio-economic spectrum are more likely to have a lower level of knowledge of skin tumours. They may not be as aware of the significance of lumps and bumps of the eyelids, and hence tend to seek medical attention when lesions get bigger and more alarming or symptomatic. Large size, neglected and long-standing tumour are well-known risk factors for aggressive BCC and orbital invasion. Moreover, sizeable tumours can reflect lengthy duration. Treatment delay also worsens the prognosis of BCC and hence, early detection of lesions is vital in order to reduce ocular morbidity, secondary orbital invasion or recurrences, and to avoid exenteration. [20-23]

To date, there is no literature linking frequency and size of periocular BCC at presentation and socio-economic status. A nationwide cohort study from Denmark involving 52,166 cases of BCC, evaluating the association between socioeconomic status and non-melanoma skin cancer, reported that high socioeconomic status, measured by 4 parameters (namely disposable income, education, affiliation to the work market and type of district), was strongly linked with a higher risk of BCC. This is more likely going to reflect different patterns of sun-exposure related to socio-economic status as opposed to neglect and late medical attention.[24] In contrast, our study is based on a significantly smaller sample size. However, it does offer a more complete picture of socio-economic deprivation through the SIMD scores encompassing 37 indicators of deprivation, for which we are the first to apply to patients with periocular BCC.

In conclusion, our study has shown that higher frequency of periocular BCC and larger periocular BCC size at presentation is linked to a lower socio-economic status. This highlights the importance of raising awareness among populations of the more deprived areas of the significance of lumps and bumps within the periocular regions (and other regions for that matter), so that treatment can be started earlier to achieve better surgical and cosmetic outcomes for the patients.

However, while complete eradication of the tumour is desirable, this may often be challenging as BCCs can sometimes extend beyond their apparent clinical margins. Since prevention is preferable to treatment, people living in highly deprived areas have to be informed via the help of targeted campaigns, that the incidence of periocular skin cancers can be reduced with simple measures such as avoiding extensive sun exposure or the long term use of sunglasses, sunscreens and hats with brims.

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