

Increase in the incidence of basal cell carcinoma in a university hospital between 1999 and 2009

Aumento da incidência de carcinoma basocelular em hospital universitário: 1999 a 2009

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Abstract: The incidence of basal cell carcinoma is increasing worldwide. An ecological study was conducted using the pathology reports from 5169 cases of basal cell carcinoma diagnosed at the Botucatu School of Medicine, Universidade Estadual Paulista Julio de Mesquita Filho (UNESP) between January 1999 and December 2009. The mean increase in the incidence of basal cell carcinoma over this period was 90.6%, suggesting that one case of basal cell carcinoma could be expected for every 15 patients referred to dermatology. This trend was also found when the incidence was indexed according to the absolute number of histopathology exams, the total number of hospital consultations, the total number of dermatological consultations and the population of the town of Botucatu

Keywords: Carcinoma, basal cell; Epidemiology; Incidence; Risk factors; Ultraviolet rays

Resumo: A incidência do carcinoma basocelular vem aumentando em todos os países. Realizou-se estudo ecológico de 5169 laudos de carcinoma basocelular, da FMB-Unesp, entre janeiro/1999 e dezembro/2009. O incremento médio da incidência para o período foi de 90,6%, projetando-se um diagnóstico para cada 15 pacientes encaminhados à dermatologia. Tal tendência se manteve, mesmo quando indexada pelo número de laudos histopatológicos, movimento hospitalar, atendimentos da dermatologia e população de Botucatu.

Palavras-chave: Carcinoma basocelular; Epidemiologia; Fatores de risco; Incidência; Raios ultravioleta

Basal cell carcinoma (BCC) is the most common type of malignant tumor in humans. Its cumulative risk in the Caucasian population is over 30% and its incidence has been increasing worldwide at an annual rate of 3-7%, constituting a public health issue.^{1,2}

The reasons for this increase in frequency are yet to be fully clarified; however, they may involve the increased awareness of the population regarding the condition and improvements in the training of professionals to establish diagnosis at earlier stages; longer

unprotected exposure to ultraviolet radiation and more leisure time; a culture that idealizes tanned skin; depletion of the ozone layer; increased longevity and the consequent proportional rise in the elderly segment of the population.³

The treatment of choice continues to be surgical removal of the lesion, which also facilitates the retrieval of computerized data from pathology services, enabling these data to be correlated with demographic indicators and with the demands on the

Received on 21.01.2010.

Approved by the Advisory Board and accepted for publication on 22.01.10.

* Study conducted at the Department of Dermatology, Botucatu School of Medicine, Universidade Estadual Paulista Julio de Mesquita Filho (UNESP), Botucatu, São Paulo, Brazil.

Conflict of interest: None / *Conflito de interesse: Nenhum*

Financial funding: None / *Suporte financeiro: Nenhum*

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healthcare system.

An ecological study was performed using 5,169 pathology reports from the Pathology Department of the Botucatu School of Medicine, São Paulo State University, issued between January 1999 and December 2009. Annual incidences were compared with the number of histopathology exams, hospital attendance, dermatology consultations and the size of the population of the city of Botucatu.

Data were tabulated in the Microsoft Excel 2007 software program and correlated using simple linear regression. P-values < 0.05 were considered statistically significant.

A substantial increase was found in the incidence of BCC at this institute, even when correlated with other population indexes (Table 1 and Graph 1). The mean increase calculated for the period was over 90%, with a projected expectation of 650 cases of BCC in this service for the year of 2010.

The increase was most pronounced when the number of cases of BCC was compared with the overall number of new cases attended at the dermatology clinic of this institute, which decreased in absolute numbers, suggesting that cases of BCC occupy an increasingly large percentage of the daily routine within this speciality.

Considering that the cases of primary BCC diagnosed in this service represent 65.4% of all dermatology cases annually, the expectation for 2010 would be of one case of BCC for every 15 patients referred by basic healthcare clinics for screening at this institute, constituting an increase of 73.2% in 11 years.

In the United Kingdom, the annual incidence rate of BCC increased from 174 to 265 per 100,000 inhabitants in 10 years. In the United States, the rate doubled in 20 years. In Brazil, the percentage of skin cancers as a whole increased 113% between 2001 and 2006. Furthermore, international studies confirm the increased incidence even following adjustment for

gender and age, this increase being even more pronounced in the elderly, in young women and with respect to lesions located on the trunk.³⁻¹⁰

Ecological studies are naturally associated with biases and their principal objective is to carry out a diagnosis of health in general and to identify trends.

During this period, some cases of BCC were probably recorded in duplicate in the case of patients who had a biopsy performed prior to surgery. In other cases, the simultaneous surgical removal of more than one BCC may have been counted as one single report. However, it is believed that the distribution of this type of error would have been homogeneous over the years of the study, thus minimizing its impact on growth estimates.

Some strikes occurred in the hospital during the period evaluated, which may have led to underestimation of the denominators at those times, since previously scheduled surgeries were largely unaffected. However, the increased incidence of BCC was greater than the increase in the city's population, corroborating a trend towards growth.

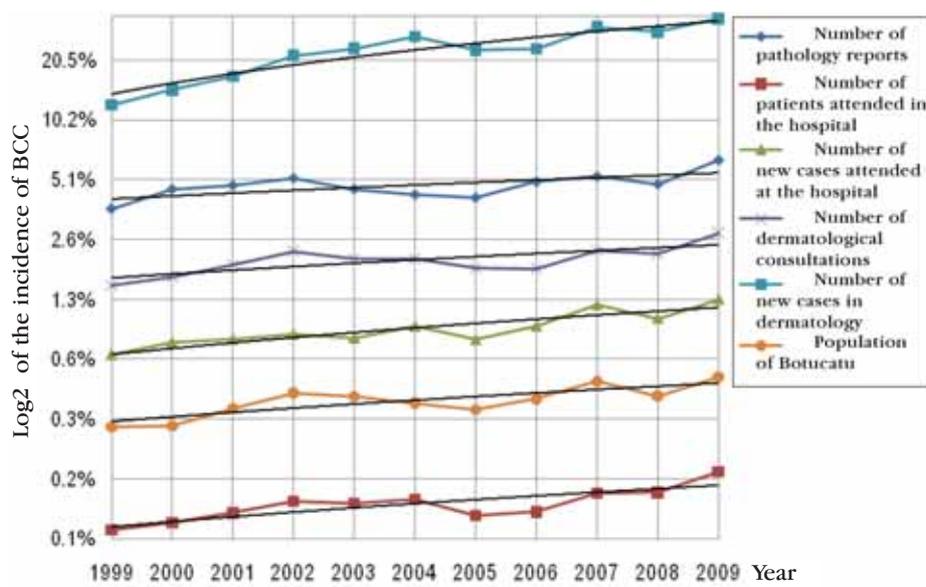
The demand at this university hospital comes almost entirely from patients within the Brazilian National Health System (SUS) and constitutes the largest volume of outpatient surgery in the region; however, this evaluation does not permit stratification of the changes in the incidence of BCC in accordance with social class. Nevertheless, the trends observed in other states have shown no differences in the incidence of this disease between populations of different socioeconomic levels.³⁻⁵

Up to 98% of the patients operated for BCC at this institute come from the region of Botucatu, 45% from the city itself. However, the institute attends the demands of a catchment area encompassing almost 700,000 inhabitants and more than 40 municipalities. Since the population of Botucatu would appear to be representative of the population in this sample, the

TABLE 1: Mean change in the demographic indexes and the incidence of basal cell carcinoma (BCC) according to each index, over the 11-year period

Index	Mean change over the 11-year period	
	Mean change in index	Mean increase in the incidence of BCC in comparison with the index
Number of pathology reports issued	39.0%	35.2%
Number of patients attended in the hospital	19.0%	61.8%
Number of new cases attended at the hospital	11.4%	72.1%
Number of dermatological consultations	29.6%	46.5%
Number of new cases in dermatology	-21.7%	132.8%
Population of Botucatu	20.8%	55.9%
Incidence of BCC*	90.6%	-

* Absolute rate (not indexed)



GRAPH 1: Temporal series of the incidence of basal cell carcinoma (BCC) according to certain population indexes *
* All the regressions resulted in the coefficient >0 and $p < 0.01$.

occurrence of BCC in the population of that city was indexed in an attempt to calculate regional variations.

Further studies conducted to analyze the increase in primary tumors stratified according to gender, age, affected site and histological type may substantiate the findings of the present study and facilitate identification of subgroups at risk.

The increase in the annual incidence rates of BCC indexed according to different parameters, together with the data from other countries, highlight the trend towards an increase in the prevalence of this con-

dition and serve as an alert to the healthcare system.

Dermatologists should be attentive to this expressive increase in BCC in order to implement primary prevention measures in the population, to improve therapeutic management of diagnosed cases, increase campaigns aimed at early detection, encourage the promotion of educational programs in schools and communities, and reduce the morbidity and costs to the healthcare system through the early recognition and treatment of lesions. □

REFERENCES

1. Roewert-Huber J, Lange-Asschenfeldt B, Stockfleth E, Kerl H. Epidemiology and aetiology of basal cell carcinoma. *Br J Dermatol.* 2007;157(Suppl 2):47-51.
2. Kopke LFF, Schmidt SM. Carcinoma basocelular. *An Bras Dermatol.* 2002;77:249-85.
3. Bath-Hextall F, Leonardi-Bee J, Smith C, Meal A, Hubbard R. Trends in incidence of skin basal cell carcinoma. Additional evidence from a UK primary care database study. *Int J Cancer.* 2007;121:2105-8.
4. Hoey SE, Devereux CE, Murray L, Catney D, Gavin A, Kumar S, et al. Skin cancer trends in Northern Ireland and consequences for provision of dermatology services. *Br J Dermatol.* 2007;156:1301-7.
5. 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 Aust.* 2006;184:6-10.
6. Demers AA, Nugent Z, Mihalciou C, Wiseman MC, Kliever EV. Trends of nonmelanoma skin cancer from 1960 through 2000 in a Canadian population. *J Am Acad Dermatol.* 2005;53:320-8.
7. de Vries E, Louwman M, Bastiaens M, de Gruijl F, Coebergh JW. Rapid and continuous increases in incidence rates of basal cell carcinoma in the southeast Netherlands since 1973. *J Invest Dermatol.* 2004;123:634-8.
8. Koh D, Wang H, Lee J, Chia KS, Lee HP, Goh CL. Basal cell carcinoma, squamous cell carcinoma and melanoma of the skin: analysis of the Singapore Cancer Registry data 1968-97. *Br J Dermatol.* 2003;148:1161-6.
9. Souza RJSP, Mattedi AP, Rezende ML, Correa MP, Duarte EM. Estimativa do custo do tratamento de câncer de pele tipo melanoma no Estado de São Paulo - Brasil. *An Bras Dermatol.* 2009;84:237-43.
10. Brasil. Ministério da Saúde. Estimativas 2008: Incidência de Câncer no Brasil. Rio de Janeiro: INCA, 2007. 94 p.

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How to cite this article/*Como citar este artigo:* Schmitt JV, Chinem VP, Marques MEA, Miot HA. Increase in the incidence of basal cell carcinoma in a university hospital between 1999 and 2009. *An Bras Dermatol.* 2010;86(2):375-7.