Data analysis of the Brazilian Society of Dermatology skin cancer prevention campaign, 1999 to 2005 [*]

Análise de dados das campanhas de prevenção ao câncer da pele promovidas pela Sociedade Brasileira de Dermatologia de 1999 a 2005 [*]

Sociedade Brasileira de Dermatologia[*]

Abstract: BACKGROUND: Skin cancer is the most common type of cancer in Brazil. The estimate for 2006 is 122400 new cases accounting for 26% of the total cancer burden. Sun exposure is the main risk factor. OBJECTIVE: to evaluate the frequency of skin neoplasm in the country, its geographic distribution and people's attitude regarding sun exposure protection. METHODS: The Brazilian Society of Dermatology has been promoting a national screening campaign since 1999, where free dermatological examination and information on the risks of solar exposure are provided. RESULTS: From 1999 to 2005, this campaign performed 205869 dermatological exams, diagnosing 17980 (8.7%) cases of skin cancer (13194 basal cell carcinomas, 2482 squamous cell carcinomas, 1057 melanomas and 1247 other neoplasms). The ratio between sexes was 1.7 and the prevalence was 1.6% in black, 3.2% in Asian descendent, 3.4% in mestizo, and 12.7% in Caucasian individuals. Santa Catarina and Rio Grande do Norte were the national states with the highest prevalence rate. The majority of people, irrespective of sex or race, suffered unprotected solar exposure, hence pointing to the great importance that educational activity must play in the prevention of this disease in the country. CONCLUSION: Skin neoplasm is frequent among the Brazilian population, but unprotected sun exposure is not yet perceived as an important health risk.
Keywords: Carcinoma, basal Cell; Carcinoma, squamous cell; Melanoma; Risk-taking; Skin neoplasm; Skin neoplams/epidemiology; Skin neoplams/diagnosis; Skin neoplams/prevention and control

Resumo: FUNDAMENTOS: O câncer da pele é a neoplasia de maior incidência no Brasil, com 122.400 casos novos estimados para 2006, o que corresponde a 26% do total de neoplasias malignas. A exposição solar é o principal fator de risco conhecido. Objetivos: Avaliar a freqüência das neoplasias cutâneas no país, sua distribuição geográfica e hábitos de proteção contra exposição solar. MÉTODO: A SBD promoveu, de 1999 a 2005, a Campanha Nacional de Prevenção ao Câncer da Pele, com exame dermatológico e orientação sobre exposição, tendo registrado dados demográficos, hábitos de exposição solar e diagnósticos. RESULTADOS: Foram examinados 205.869 indivíduos, sendo diagnosticados 17.980 casos de diferentes tipos de câncer da pele (13.194 de carcinoma basocelular, 2.482 de espinocelular, 1.057 de melanoma e 1.247 outras neoplasias), correspondendo a 8,7% dos examinados. A razão de prevalência entre homens e mulheres foi de 1,7, e a proporção de câncer em negros foi de 1,6%; em amarelos, de 3,2%; em pardos, de 3,4%; e em brancos, de 12,7%. Os estados com maior prevalência foram Santa Catarina e Rio Grande do Norte. Mais de 50% dos examinados se expunham ao sol sem proteção, o que reforça a importância de atividades educativas de prevenção. CONCLUSÕES: O câncer da pele é freqüente no país, e a proteção contra seu principal fator de risco, a exposição solar, é ainda pouco valorizada.
Palavras-chave: Assunção de riscos; Carcinoma basocelular; Carcinoma de células escamosas; Melanoma; Neoplasias cutâneas; Neoplasias cutâneas/diagnóstico; Neoplasias cutâneas/epidemiologia; Neoplasias cutâneas/prevenção e controle

---

INTRODUCTION

Skin cancer, melanoma and non-melanoma (basal cell carcinoma and squamous cell carcinoma), is the most frequent neoplasm in different parts of the world1 as well as in Brazil, were the National Cancer Institute (INCA) estimates 122400 new cases for 2006, accounting for 26% of the total[1] amount of malignant diseases in the country[2]. There are important evidences that the three types of skin cancer are caused by sun exposure, its most important risk factor. Others are described, though, such as alcohol use[3], smoking, in the case of lip squamous cell carcinoma, arsenic exposure, ionizing radiation and chronic dermatologic irritative processes[4]. The difficulties in measuring cumulative sun exposure make the identification of risk factors more complex, since imprecision in that measurement may generate bias[5].

Besides the magnitude of the problem, there is evidence of an increase in morbidity and mortality due to skin cancer, thus making it a public health problem that can be controlled through primary prevention - protection against excessive exposure to sun light- as well as secondary, through early diagnosis and timely treatment.[1]

This growing trend in morbidity may be due to multiple factors: increased recreational exposure to ultraviolet radiation, specially in childhood; changes in habits of different populations regarding mechanical protection and daily sun exposure, such as the use of hats, umbrellas and clothes that expose the body more[6]; esthetic value put on suntan, which, besides stimulating unprotected sun exposure during leisure, increases the habit of artificial tanning; increased incidence of ultraviolet (UV) rays, especially, UV-B and UV-A, due to the thinning in the ozone layer. This phenomenon is worse in the areas close to the Antarctica, changing geographic risk distribution due to UV radiation, which is worse in the Equator.

In many parts of the world, health professionals are not aware of the severity of the risk for skin cancer. To change this scenario, the inclusion of nurses in the diagnostic and referral processes[8] or educational interventions on practices for the control of skin cancer[7] have been created for primary health service professionals.

In Brazil, the awareness of the severity of the problem among those responsible for public health is influenced by the idea that racial blending would determine a lower risk for the Brazilian population. There is no question that the non-melanoma skin cancer is more frequent in fair skin people, more sensitive to the sun, what does not invalidate the risk for those of dark skin. Estimated data from the National Cancer Institute[2] demonstrated the severity of the problem in the country. The meteorological services are already aware of the increased UV exposure and daily report exposure levels in different regions of the country.

Children should be the main target of primary prevention, since they are exposed to the sun three times more than adults, and cumulative exposure during the first 10 to 20 years of life determines the risk for skin cancer. Childhood is then a more vulnerable phase of life regarding the noxious effects of the sun. Thus, a primary prevention program for skin cancer, necessarily involves parents and teachers, who should be responsible for avoiding exposing children to the sun during the most intense periods of UV radiation, between 10 a.m. and 4 p.m., creating the habit of physical protection, such as the use of hat or sunshade, as well as sunscreen with sun protective factor of 15 or more.

Secondary prevention in the adult population can and should be done as a healthcare routine, what demands more commitment of the health professionals as well as of the general population to preventive actions.

It is worth pointing out that the adult population of today, target of secondary prevention, will be responsible for implementing primary prevention in children; in other words, the diagnostic preventive campaigns also aim at awareness of primary prevention.

Under this perspective, for the last seven years the Brazilian Society of Dermatology (SBD) has promoted the National Campaign for the Prevention of Skin Cancer (CNPCP). On the day of the campaign, between 9 a.m. and 3 p.m., in most states of the country, dermatologists examine the population for free and explain sun exposure habits.

This initiative and the reporting of sun exposure risks by the media, have raised the awareness of the problem among the Brazilian population, gradually crating a favorable environment for primary prevention initiatives in childhood.

Although the data collected in the campaigns are the records of an activity and not data collected for research, their analysis might enlighten the problem of skin cancer in Brazil.

PATIENTS AND METHODS

The SBD has developed, since 1999, a national program structured on continuous actions for prevention and detection of skin cancer. The most important module of this program is the CNPCP, held annually. Its goal is to offer free dermatologic exam and education on prevention and early diagnosis of the disease. Every capital city, as well as some inland cities receives out-

patient's clinics that are registered at the SBD. About a thousand voluntary dermatologists see patients and the suspicious cases of cancer are referred to biopsy for diagnosis. Epidemiologic data, such as sex, age, skin color, sun protection, personal or family history of skin cancer and probable diagnosis are collected in a standard form and send to the SBD for analysis.

With the intention of assessing the association of the cases diagnosed with the known risk factors, a descriptive analysis and multivariate logistic regression of the data collected were performed, using as independent variables: sex, age, skin color, personal and family history of skin cancer, and as dependent variable, diagnosis of skin cancer. Odds ratio (OR) was used as association measure.

RESULTS

Between 1999 and 2005, the CNPCP performed 205869 dermatological exams, diagnosing 17980 cases of different skin cancers (8.7% of the exams). Out of the total diagnosed cases, 13194 were basal cell carcinomas; 2482 squamous cell carcinomas; 1057 melanomas and 1247 other neoplasms.

Data collection was standardized as from 2000, thus some 1999 data were not included in part of the analysis.

TV mentioned by 38% of patients as the communication medium that motivated them to attend the campaign.

Graph 1 plots the number of exams performed each year, with a growing trend, showing progressive participation of professionals and the general population. The expansion on the number of people examined was not followed by a decrease in the proportion of cancer among them, as might be expected. On the contrary, there was an increase on it, as shown on Graph 2. The proportion of people examined with no skin conditions raised slightly, from 16.2%, in 2000, to 19.2% in 2005, indicating that the increase in the number of people examined was not due to self-selection of people with dermatoses. Graph 3 shows the prevalence rates of different skin cancers diagnosed between 2000 and 2005.

The proportion of men varied from 38 to 40% along the years, with a mean of 39%. Skin color distribution was 63% of white, 29% of mulatto, 7% of black and 1% of yellow individuals, with no significant variation along the campaign years.

A family history of skin cancer was mentioned by 14.2% of total interviewees, increasing every year, from 11.5% in 2000 to 16% in 2005, which corresponds to a relative increase by 40% during this period. A past history of skin cancer was mentioned by 6.8% of individuals examined and showed an ascending trend: from 5.6%, in 2000 and 2001, to 8.5% in

GRAPH 1:Individuals examined in the National Campaign for the Prevention of Skin Cancer 1999 to 2005
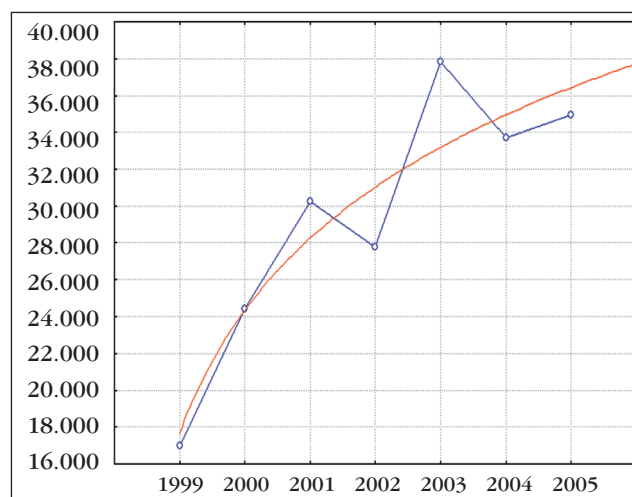
2005, that is, a relative increase by 53%.

A total of 2113 cases of skin cancer were diagnosed in non-white people, with the following distribution: 1.6% in black; 3.2% in yellow; 3.4% in mulattoes; the Caucasians accounted for 12.7%.

Sex, skin color and past or family history are known risk factors, which were confirmed by the data collected. Table 1 shows the results of one logistic regression for 2005, including the above mentioned variables and using odds ratio (OR) as an association measure.

Nine percent of those examined denied sun exposure, and 23% referred protected exposure (ranging from 21%, in 2000, to 25%, in 2005).

Although men have a higher risk for skin cancer (sex ratio of 1.7), they mentioned less protection

GRAPH 2: Prevalence of skin cancer National Campaign for the Prevention of Skin Cancer 1999 to 2005
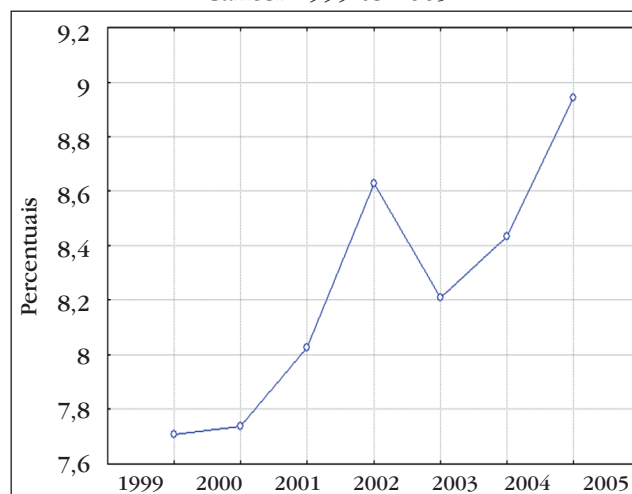
TABLE 1: National Campaign for the Prevention of Skin Cancer - 2005
Logistic regression results

Independent variable	OR	95% CI lower limit	95% CI upper limit
Past history of skin cancer			
Yes vs. No	5.46	4.99	5.98
Family history of skin cancer			
Yes vs. No	1.79	1.64	1.96
Sex			
Male vs. Female	1.75	1.62	1.88
Skin color			
White vs. Non-white	3.03	2.75	3.34
Non-mulatto vs. Mulatto	2.42	2.18	2.68
Non-black vs. Black	6.48	4.65	9.02
Non-yelow vs. Yellow	1.61	1.06	2.43

than women, as displayed in Graph 4. Graph 5 shows that most individuals reported unprotected sun exposure.

Graph 6 shows the geographic distribution in the country, with the prevalence rates from 2001 until 2005. The states of Tocantins, Rio Grande do Norte and Santa Catarina had a prevalence rate greater than 14%, and the states of Acre, Piaui and Rio Grande do Sul, higher than 10% and lower than 12%. In Tocantins, the campaign has been going on for only one year and, in the case of Acre, the data has been collected for two years and are very discrepant (5.26%, in 2001, and 12.69%, in 2002). In other states mentioned, the campaign was held for at least four years, the variations in yearly results has been very small.

Graph 7 shows the mean age of the intervie-

wees and of those having skin cancer diagnosed in different regions of the country.

DISCUSSION

Skin cancer campaigns are screening activities for early diagnosis, leading to fast treatment, decreased morbidity and increased patient survival. Skin malignant neoplasms, although frequent and with increasing incidence, upon diagnosis do not have symptoms, and are often not the main complaint or the reason for visiting the doctor, thus showing the importance of physical examination.[9] Skin cancer screening programs can give an early diagnosis of melanoma in 90% of the cases, reducing mortality.[10] Early diagnosis of non-melanoma skin cancer, leads to substantial reduction on non-aesthetical surgical sequelae, besides making patients more aware

GRAPH 3: Prevalence of different types of skin cancer National Campaign for the Prevention of Skin Cancer 2000 to 2005
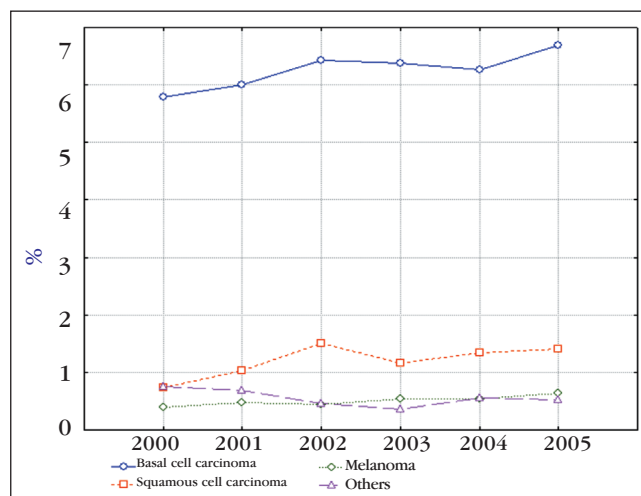
GRAFH 4: Proportion of unprotected sun exposure among individuals examined in 2000 to 2005, per sex
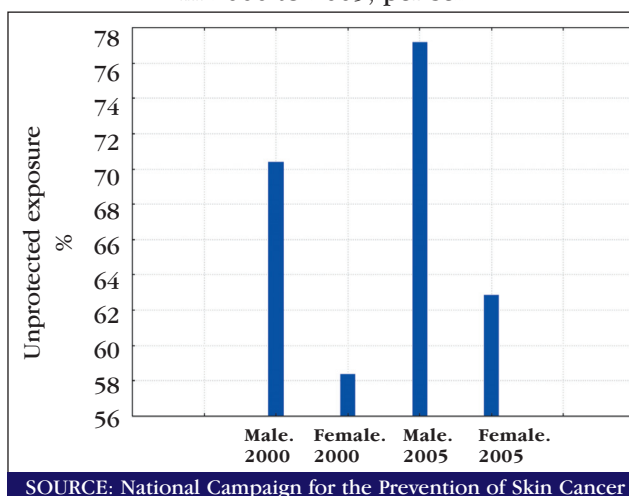
SOURCE: National Campaign for the Prevention of Skin Cancer

GRAPH 5: Proportion of unprotected sun exposure among individuals examined in 2000 to 2005, per skin color

SOURCE: National Campaign for the Prevention of Skin Cancer
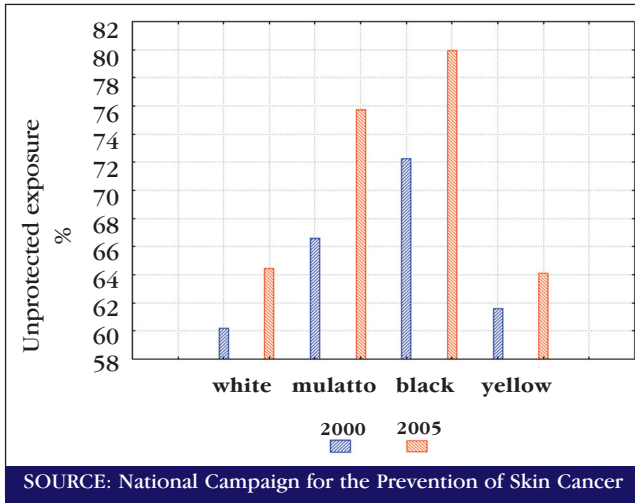
GRAPH 7: Mean age of individuals examined and presence of skin cancer per region 1999 to 2005

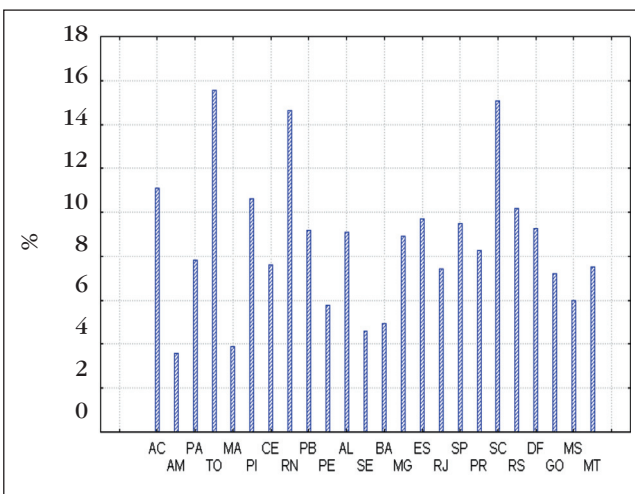SOURCE: National Campaign for the Prevention of Skin Cancer
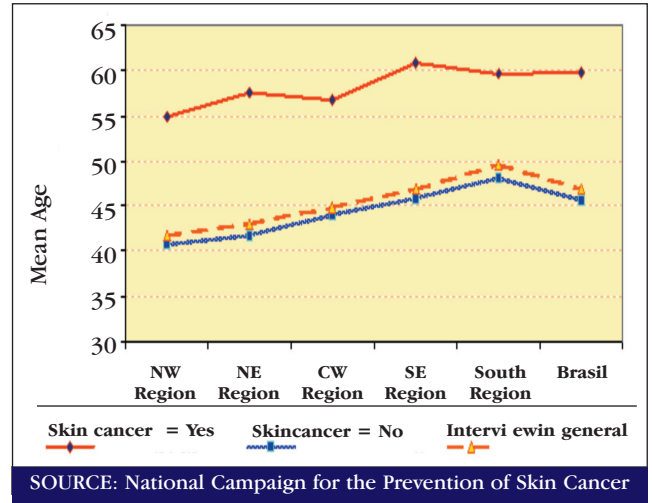
of the risk of recurrence as well as of the appearance of new tumors.

The cases diagnosed during the campaigns are considered as prevalent, that is, their magnitude depends not only on the incidence of skin cancer but also on how long the lesion has been present. In regions where access to diagnosis is difficult, and in population groups less aware of the clinical manifestations, the high proportion of skin cancer is due to a longer pre-diagnostic period, not necessarily indicating a higher risk. Thus, the prevalence ratio of 1.7 between men and women, described on this paper, does not mean higher risk alone, but also less skin care, which is considered as something esthetic and

of the female nature. This hypothesis is reinforced by the lesser proportion of men participating in the campaigns and referring use of sun protection.

Restricted access to diagnosis could explain part of the geographic distribution, such as the high prevalence rate in the state of Tocantins. The finding that the states of Santa Catarina and Rio Grande do Norte have the higher prevalence rates, corroborates the estimates from the National Cancer Institute that the capital cities Florianopolis and Natal, respectively, have the higher incidence of non-melanoma skin cancer in the country.[2] Differences in solar insolation and population susceptibility explain this geographic distribution.

The INCA estimates are based on mortality data for a known place and lethality data for similar places that have a population-based cancer registry. Those estimates should be considered as minimum, due to the possibility of under-registry.[2] Besides, the coverage and quality of the Mortality Information System (SIM) vary a lot among the different regions, what could generate distortions in the estimates for states with low SIM coverage in the countryside; the capital city records are considered more reliable. The INCA estimates for non-melanoma skin cancer are not always consistent, such as those for the capital city of Vitoria – 38.9 per 100000 male inhabitants and 130.4 per 100000 women[2]. This sex ratio is epidemiologically very unlikely

The prevalence rates seen in the campaigns can not be considered as the actual prevalence of non-melanoma skin cancer not diagnosed by the healthcare services, since the campaign participants are self-selected and this may vary in different years and regions. We do expect, though, that the preva-

GRAPH 6: Proportion of skin cancer cases per state National Campaign for the Prevention of Skin Cancer 2001 to 2005

lence observed in the campaign be a function of the real prevalence, since there is much evidence, although incomplete, leading to the same conclusions and reinforcing the activities. The high prevalence findings in the states of Santa Catarina and Rio Grande do Norte corroborated the estimates of the National Cancer Institute and expand the idea that the non-melanoma skin cancers would be a public health problem confined to the south of the country, where immigration of Europeans was more recent.

An increase on the prevalence of basal cell carcinoma, squamous cell carcinoma and melanoma has been observed along time, which is consistent with the epidemiologic findings of other countries[1] as well as of specific areas in Brazil.[11,12] We do have to consider, though, that since it is a chronic disease, the time interval analyzed is short to draw any conclusion.

There is one important piece of data on unprotected sun exposure. One should take into account that the population that attends the campaign is self-selected, having access to information about time and place of the skin exam and motivation to participate. This motivation is, no doubt, associated to a higher concern with skin health, which is corroborated by the higher proportion of women. Thus, it is likely that such population protects itself from the sun more than the general population. Even so, more than 50% of respondents declared to expose themselves to the sun unprotected, irregardless of sex or skin color.

The habit of sun exposure for tanning is fre-quent and it has a high esthetic value in the country. This leads to higher risk, as well as the perception that sun protection is needed only when one intends to get tanned and during summer time.[13] Sun protection is generally not considered for such activities as outdoors sport practices and walking. The adequate use of sunscreen is low not only due to economic reasons but also to wrong perceptions by many people. Moreover, it is necessary to overcome the idea that skin care is only for esthetic purposes, which leads to more unprotected exposure among men, as shown by the data.

The results concerning sun exposure by the campaign participants, as well as other studies in the country, show that education should be a priority among the many strategies for control of skin cancer. Unfortunately, not even health services consider the need for counseling on sun exposure.[14] Thus, efforts should be made towards other medical specialties, decision makers in the health system, and those who formulate education policies, so that skin cancer prevention could be initiated as early as in childhood, thus avoiding cumulative sun exposure.

CONCLUSION

The high frequency of skin cancer in the country makes it an important public health issue, but sun exposure protection - its main risk factor is not a common habit of the population.   ❑

REFERENCES

1. Diepgen Thomas L, Mahler V. The epidemiology of skin cancer. Br J Dermatol. 2002;146:1-6.
2. Brasil. Ministério da Saúde. Estimativa 2006: incidência de câncer no Brasil. Rio de Janeiro: INCA; 2005.
3. Fung TT, Hunter DJ, Spiegelman D, Colditz GA, Rimm EB, Willett WC. Intake of alcohol and alcoholic beverages and the risk of basal cell carcinoma of the skin. Cancer Epidemiol Biomarkers Prev. 2002;11(Pt 1):1119-22.
4. Marks R. The epidemiology of non-melanoma skin cancer: who, why and what can we do about it. J Dermatol. 1995;22:853-7.
5. Rosso S, Schraub S, Tumino R, Franceschi S, Zanetti R. Reproducibility of skin characteristic measurements and reported sun exposure history. Int J Epidemiol. 2002;31:439-6.
6. Athas WF, Hunt William C, Key Charles R. Changes in nonmelanoma skin cancer incidence between 1977-1978 and 1998-1999 in Northcentral New Mexico. Cancer Epidemiol Biomarkers Prev. 2003;12:1105-8.
7. Mikkilineni RR, Weinstock MA, Goldstein MG, Dube CE, Rossi JS. The impact of the basic skin cancer triage curriculum on provider's skin cancer control practices. J Gen Intern Med. 2001;16:302-7.
8. Geller AC, Annas GD. Epidemiology of melanoma and nonmelanoma skin cancer. Semin Oncol Nurs. 2003; 19:2-11.
9. Pinheiro AMC, Cabral ALSV, Friedman H, Rossi J S. Melanoma cutâneo: características clínicas, epidemiológicas e histopatológicas no Hospital Universitário de Brasília entre janeiro de 1994 e abril de 1999. An Bras Dermatol. 2003;78:179-86.
10. Rocha FP, Menezes AMB, Almeida Junior HL, Tomasi E. Especificidade e sensibilidade de rastreamento para lesões cutâneas pré-malignas e malignas. Rev Saude Publica. 2002;36:101-6.
11. Nasser N. Epidemiologia dos carcinomas basocelulares em Blumenau, SC, Brasil, de 1980 a 1999. An Bras Dermatol. 2005;80:363-8.
12. Nasser N. Epidemiologia dos cânceres espinocelulares - Blumenau (SC), Brasil, de 1980 a 1999. An Bras Dermatol. 2004;79:669-77.
13. Costa FB, Weber MB. Avaliação dos hábitos de exposição ao sol e de fotoproteção dos universitários da Região Metropolitana de Porto Alegre, RS. An Bras Dermatol. 2004;79:149-155.
14. Nora AB, Lovatto L, Panarotto D, Boniatti MM. Freqüência de aconselhamento para prevenção de câncer da pele entre as diversas especialidades médicas em Caxias do Sul. An Bras Dermatol. 2004;79:45-51.

NOTE

Upon conclusion of this issue, the Brazilian Society of Dermatology carried out the 8th National Skin Cancer Prevention Campaign. It achieved the historical mark of 41,751 appointments and is considered the largest campaign against skin cancer all over the world.