



Sunburns and sun habits in a group of Brazilian athletes

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ABSTRACT

Background and objectives: To evaluate the knowledge and sun protection habits of a group of Brazilian athletes. Sunburns are considered the main environmental risk factor for melanoma, especially before the age of 20. Most of professional athletes are young individuals intensively exposed to sunlight in their activities and leisure as well, being therefore susceptible to sunburns. **Methods:** During the XIV Pan-American Games, 115 Brazilian athletes answered to a questionnaire on sunburn during training and leisure; phototype; use of sunscreen (USS); importance of sun protection (ISP) and place of practice (indoors x outdoors). **Results:** The majority was outdoor (73%), and 59% had light phototype (I, II or III). Comparing the athletes by their practicing place, *outdoors* presented higher rates of sunburn episodes, ISP and USS during their training periods, while in leisure the groups did not show any difference. Grouped by phototypes, athletes with lighter skin complexion presented more sunburn episodes in both training and leisure. In multivariate analysis for sunburn risk, light phototypes and ISP were statistically significant. **Conclusions:** Outdoor sports modalities give origin to more sunburn in their athletes. However, during leisure, both outdoor and indoor athletes present similar sun habits, evidencing that in this moment they form a homogeneous group regarding sun light exposure. Athletes with lighter phototypes are more prone to sunburns in both leisure and training. The rates of sunscreen use are lower than the recommendation. Sun protection should be stimulated in both sports and leisure activities in Brazilian athletes.

INTRODUCTION

The ultraviolet radiation (UVR) has been considered in the latest years, as the main environmental risk factor for the development of melanoma and non-melanocytic skin neoplasm⁽¹⁻⁴⁾. Moreover, it is also responsible for further immediate and long term damage. Acute, exaggerated sun exposure causes immunosuppression and burns, many times painful, on the tegument. The accumulation of exposure to the UV radiation leads to early photo aging as well⁽⁵⁾.

The solar habits and the population's knowledge on this damage may determine or not the outbreak of these conditions. A case-control study conducted in the south of Brazil by Bakos *et al.* with patients with melanoma showed history of frequent sunburn as

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being the main risk factor for the disease development. Besides that, frequent use of sunscreen with Protection Factor (SPF) higher than 15, was identified as having protection action against the melanoma development⁽¹⁾.

Epidemiological studies show that the solar exposure in children and youngsters is closely connected with the development of skin neoplasm in adults⁽⁶⁻⁷⁾. Furthermore, research conducted with cyclists, triathletes and children playing sports show that the irradiation absorbed is always high and sometimes difficult to be measured, leading hence to burns⁽⁸⁻¹⁰⁾.

Competition athletes begin their training mostly at very young age and are consequently exposed, at those age groups, to an additional load of ultraviolet radiation during training and competitions periods. Moreover, leisure time of the youngsters usually include outdoors activities, adding to the UVR exposure accumulation. Brazil is a country with tropical climate, allowing many sports activities to be performed outdoors.

The literature review did not show evidence of any research being conducted with Brazilian professional athletes concerning their solar habits.

The aim of this work is to evaluate the knowledge of a group of Brazilian athletes on the risks of solar excess and their photo protection habits during their sports activities and leisure time.

MATERIAL AND METHODS

In the time period between August 01 and 17, 2003, in the XIV Pan-American Games held in Santo Domingo, Dominican Republic, a sample of 115 athletes from the Brazilian Team were interviewed through a standardized questionnaire. The questionnaire consisted of questions with simple choices about knowledge on solar exposure and protection habits. The forms were anonymous, which did not allow the athletes' identification, only registering their age, sex, phototype and sports modality, besides the given questions.

The project application was approved by the Medical Board of the Brazilian Olympic Committee in the described guidelines. The athletes answered the questionnaire after signing a consent form, as long as they observed the inclusion criteria which were: individuals of both sexes; athletes from the Brazilian team and the given competition participants. The sample was selected by convenience, being included athletes from any sports modality and with no exclusion criteria.

The variables evaluated through the questionnaire were:

Phototype, classified according to Fitzpatrick scale⁽¹¹⁾, in six types. The phototypes were grouped in light (I, II and III) and dark (IV, V and VI) in order to obtain better statistical analysis.

Sports Practice Site: the sports were classified according to their activities site; *outdoor*, those which had their sports activities always or most of the time outdoors, and *indoor*, those which practiced their activities in closed places.

The variables: importance of protecting against the sun during the sports activities and leisure; number of sunburns and use of

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sunscreen in sports and leisure were investigated with questions of simple answers (yes/no type).

Statistical analysis

The quantitative data were described with average and standard deviation and with the category ones, percentages were used. The chi-square and the exact by Fisher tests were used whenever necessary in the comparison of the proportions. The logistic regression was used in order to adjust for potential effects of confusion between the studied variables and the interest closings (burns during training and leisure). The significance index was established at $\alpha = 0.05$ and the data were analyzed with the SPSS program, version 12.0.

RESULTS

115 athletes were interviewed: 61 men and 54 women, with age range of 15 and 35 years and averages of 23,5 and 21,7, respectively. The majority of the athletes (73%) affirmed that they always or most of the times, perform their sports activities (training and competitions) outdoors (*outdoor*) and were of light phototypes (59,1%) (table 1).

TABLE 1
Summary of the demographic characteristics of the studied variables

Phototype (n = 115)	
Light	68 (59,1%)
Dark	47 (40,9%)
Competition site (n = 115)	
Outdoor	84 (73%)
Indoor	31 (27%)
ISP training* (n = 114)	
Yes	76 (66,7%)
No	38 (33,3%)
ISP leisure* (n = 104)	
Yes	74 (71,2%)
No	30 (28,8%)
Training sunburns (n = 113)	
Yes	30 (26,5%)
Sunburns leisure (n = 106)	
Yes	37 (34,9%)
US training** (n = 113)	
Yes	35 (31%)
US leisure** (n = 114)	
Yes	35 (30,7%)

* ISP: Importance of solar protection.

** US: Use of sunscreen.

Concerning the importance of solar protection, the majority of the athletes answered affirmatively both in leisure and during training (table 1). Concerning the sports practice site, the *outdoor* considered significantly more important to protect during training than the *indoor*. In leisure, no statistical difference was observed between groups (table 2).

A relevant number of athletes mentioned to have had sunburns at any time during their sports activities and in leisure (26,5% and 34,9%, respectively) (table 1). Concerning the training site, the *out-*

door athletes had more sunburns in training than the *indoor* ones. In leisure, there was not significant difference between the groups (table 2). Concerning the grouped phototypes, the light ones suffered more sunburns during training and leisure than the dark ones (table 3).

TABLE 3
Sunburns in training and leisure according to phototypes

	Burns training	Burns leisure
Light	27/66 (40,9%)	30/61 (49,2%)
Dark	3/47 (6,4%)	7/45 (15,6%)
	p < 0,001	p < 0,001

The majority of the athletes affirmed to wear sunscreen during training and leisure (table 1). Concerning the training site, the *outdoor* athletes were more used to wearing sunscreen than the *indoor* ones during training, while in leisure there was not statistical difference between the groups (table 2).

In multivariate analysis (table 4), having the sunburn during training and leisure as main closings, it was identified that the light phototype is an important risk factor, both during training (OR = 12,0) and in leisure (OR = 4,2). The importance of solar protection was also a considered risk factor for sunburns. The use of sunscreen did not show statistical difference in this analysis. The training site did not obtain statistical significance, despite the tendency from the *outdoor* athletes to present a higher risk while practicing sports (OR = 3,9).

TABLE 4
Multivariate analysis for sunburns in training and leisure

Sunburns training	OR	IC 95%	P
Light phototype	12,0	3,2-45,0	< 0,001
Outdoors sports	3,9	0,9-16,0	0,07
ISP*	5,8	1,3-25,1	0,02
US**	0,5	0,2-1,6	0,25
Sunburns leisure	OR	IC 95%	P
Light phototype	4,2	1,5-11,9	0,007
Outdoors sports	2,08	0,7-6,3	0,197
ISP*	9,57	1,9-47,7	0,006
US**	1,26	0,46-3,5	0,657

* ISP: Importance of solar protection.

** US: Use of sunscreen.

DISCUSSION

Recurrent sunburns during a lifetime are an important risk factor for skin neoplasms, especially when they occur in the first decades⁽¹²⁾. The studied sample is young, which places it under a population at risk level.

The fact that the *outdoor* athletes find more significant to wear protection during sports activities, and that in leisure both *outdoor* and *indoor* ones give similar answers, seems to give evidence that, while in training, probably due to the distinct degree of exposure that they have, the athletes have diverse opinions concerning the photo protection importance. Nonetheless, in their leisure time, they all make a cohesive group which sees the importance of protection, although in a much lower proportion than the recommendation. All the athletes see the importance of solar protection both in training and leisure as a way of avoiding higher statistic risk of sunburns. Perhaps this is derived from the fact that their burns are previous to their knowledge. Specific re-

TABLE 2
Sunburns and solar habits during training and leisure according to the sports practice site

	ISP training*	ISP leisure*	Burns training	Burns leisure	US training**	US leisure**
Outdoor	65/84 (77,4%)	54/76 (71,1%)	27/84 (32,1%)	29/77 (37,7%)	32/84 (38,1%)	24/84 (28,6%)
Indoor	11/30 (36,7%)	20/28 (71,4%)	3/29 (10,3%)	8/29 (27,6%)	3/29 (10,3%)	11/30 (36,7%)
	p < 0,001	p > 0,05	p = 0,027	p = 0,37	p = 0,005	p = 0,49

* ISP: Importance of solar protection.

** US: Use of sunscreen.

search in this way of thinking may collaborate in the future to better clarify this finding.

The importance of solar protection in sports is evident in a case-control study with melanoma, conducted in Argentina by Loria and Matos⁽¹³⁾. This work showed that the outdoors sports participation, accumulated in more than 5790 hours/lifetime, represented a 3,2 ratio (IC 95% 1,7-6,2) chance of the disease's development. Moreover, suffering sunburns before 15 years of age represented a 5,4 ratio of melanoma chances (IC 95% 2,7-10,6). Another research conducted by Moehrle *et al.*⁽⁸⁾, with professional cyclists in Switzerland, showed that the ultraviolet radiation exposure during their activities exceeded 30 times the international limits established by the International Commission of Non-Ionizing Radiation Protection⁽¹⁴⁾. A similar study performed with triathletes, showed that they also exceed the permitted indices during their practice⁽¹⁰⁾.

In the present sample, considering the number of sunburns, it was observed that about one fourth of the athletes had suffered burns in the sports activities and approximately one third in leisure. The *outdoor* athletes had suffered more sunburn in training than the *indoor* ones, while in leisure they occurred in similar indices. In the multivariate analysis, this supposed increased risk of the *outdoor* athletes for sunburns during training did not have statistically significant value. It only presented a tendency; we believe may be significant in a larger sample. These data suggest that the *outdoors* athletes are more prone to sunburns during their professional activities. Such scenario does not seem to occur in leisure, in which the groups level, independently of the practiced sports modality. It suggests thus, that their behavior is similar concerning the sun.

Concerning the grouped phototypes, the light ones had suffered more burns in training and leisure as well, suggesting its higher susceptibility to sun light. The multivariate analysis confirms these data and places the athletes with lighter skin (phototypes) at higher risk of sunburns, not only in training but also in leisure in the studied group.

The relevance of sunburns for the development of melanomas in the light population in Brazil was suggested in a case-control study conducted in Porto Alegre, with patients with melanoma. High recurrence sunburns history was the main risk factor for the neoplasm occurrence in the studied group, with a chances ratio of 11,4 (IC 95% 2,6-50,5). Moreover, the frequent use of sunscreen with Protection Factor (SPF) higher than 15 was identified as having protection action against melanoma development⁽¹⁾.

In the present study, 31% of the athletes wore sunscreen during training and 30,7% during leisure. Concerning the practice sites, the *outdoor* athletes wore more sunscreen in training than the *indoor* ones, probably due to their activities nature. Concerning leisure, both behaved similarly, suggesting that the protection habit in leisure has no connection with the type of sports activity. The use of sunscreen had no protective association in the sunburns, perhaps due to the fact that they were previous to their habit of wearing it. Such evidence is still mere speculation, since transversal studies are still limited for this kind of association.

The Skin Cancer Prevention Campaign of the Brazilian Society of Dermatology (SBD) from 2004 showed that 69,4% of the 33682 (37.853) patients seen did not wear sunscreen. These data suggest that the solar habits of the athletes from the present sample do not seem to dramatically vary from those from the general Brazilian population evaluated in the Campaign⁽¹⁵⁾.

CONCLUSION

Although the evaluated athletes seem to know about the risks that the solar exposure may cause, the sunburns occurred in important frequencies, not only during physical activities but also in

leisure. The athletes of lighter phototypes, a *per se* risk group for skin neoplasms⁽¹⁶⁾, are even more prone to sunburns, especially in sports practice, which makes them a group in need of extra care.

The use of sunscreen by the studied athletes is still lower than expected, although it reflects the general habits of the Brazilian population⁽¹⁵⁾. The knowledge about the risks of exaggerated sun exposure, as well as the habit of wearing sunscreen, both in sports practice and leisure, should be intensified in professional athletes in order to minimize the potential complications of unprotected sun exposure.

It is possible that studies with larger samples which represent the massive number of athletes who exist in our country are able to validate the findings of the studied population. In addition, research that allows the follow-up of athletes concerning their sun care and complications derived from that, or that prospectively evaluate the impact of photo protection in the athletes' health should be performed in order to complement and confirm the findings of this study.

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