

Determining the Effect of Sun Exposure and Physical Activity on the Incidence of Primary Progressive Multiple Sclerosis

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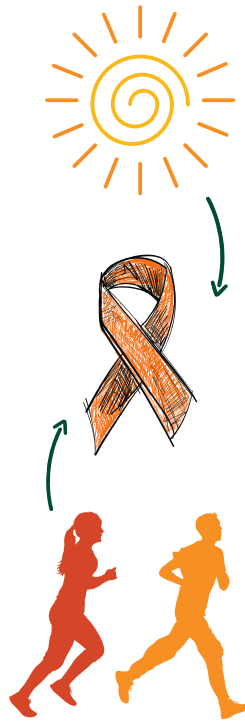
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INTRODUCTION

The onset and manifestation of primary progressive MS (PPMS) can be triggered by factors such as sun exposure and physical activity (1-3). This hypothesis needs to be investigated in a study to accurately examine the impact of these potential risk factors.

OBJECTIVES

To determine the risk of sun exposure and the amount of physical activity on the incidence of PPMS.



METHODS

This study is a population-based and case-control study in which PPMS patients and healthy controls were collected from the general population during the years 2018-2019 in Tehran, Iran. To select similar controls by gender, a similar population living in Tehran and the standard method of random digit dialing (RDD) were selected through a telephone interview. The amount of sun exposure was evaluated in terms of exposure time in two age groups of 13-19 years and over 20 years in winter and summer. Physical activity was also calculated according to the metabolic equivalent of task (MET) index per week (4, 5).

RESULTS

- The study was performed on 149 cases and 294 controls (Fig. 1).
- The mean age (SD) of cases and controls was 46.97 (9.4) and 37.67 (6.12) years, respectively (Fig. 2).
- There was a negative relationship between the average hours of sun exposure in winter and summer and the incidence of PPMS in both age groups of 13-19 and over 20 years (Tables 1 & 2).
- Regarding physical activity, only physical activity above 4000 METs per week in the group of women was negatively associated with the incidence of the disease (OR = 5.30 (CI=1.05-26.59), but in other groups this negative relationship was not observed (Table 3).

Figure 1. Case-Control distribution

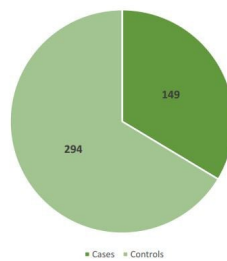


Figure 2. Case-Control Mean ages

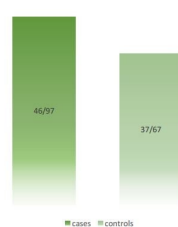


Table 1. Sun Exposure in 13-19 Y/Os

	Cases (%)	Controls (%)	Unadjusted OR (95% CI)	Adjusted OR (95% CI)	P-value	Adjusted OR in Men (95% CI)	P-value	Adjusted OR in Women (95% CI)	P-value
Mean Summer Exposure	1.69 (1.49)	2.65 (2.14)	0.73 (0.64-0.81)	0.68 (0.57-0.82)	0.00	0.55 (0.40-0.74)	0.009	0.70 (0.53-0.91)	0.000
Mean Winter Exposure	0.61 (0.57)	1.70 (1.68)	0.32 (0.23-0.45)	0.28 (0.19-0.42)	0.000	0.19 (0.09-0.40)	0.000	0.21 (0.11-0.40)	0.000

Table 2. Sun Exposure in over 20 Y/Os

	Cases (%)	Controls (%)	Unadjusted OR (95% CI)	Adjusted OR (95% CI)	P-value	Adjusted OR in Men (95% CI)	P-value	Adjusted OR in Women (95% CI)	P-value
Mean Summer Exposure	0.62 (0.98)	1.69 (1.80)	0.45 (0.34-0.59)	0.49 (0.36-0.66)	0.000	0.41 (0.26-0.64)	0.000	0.43 (0.26-0.69)	0.001
Mean Winter Exposure	0.23 (0.49)	1.25 (1.53)	0.10 (0.05-0.18)	0.14 (0.07-0.28)	0.000	0.12 (0.04-0.32)	0.000	0.06 (0.02-0.21)	0.000

Table 3. Physical Activity in Adolescence

MET per Week	Cases (%)	Controls (%)	Unadjusted OR (95% CI)	Adjusted OR (95% CI)	P-value	Adjusted OR in Men (95% CI)	P-value	Adjusted OR in Women (95% CI)	P-value
0-2000	47 (11.9)	170 (43.1)	Reference	Reference		Reference		Reference	
2000-4000	27 (6.9)	65 (16.5)	0.62 (0.35-1.10)	0.71 (0.36-1.40)	0.330	0.79 (0.28-2.18)	0.656	2.42 (0.58-10.10)	0.225
>4000	26 (6.6)	59 (15.0)	0.94 (0.45-1.79)	0.85 (0.37-1.91)	0.695	0.34 (0.10-1.11)	0.074	5.30 (1.05-26.59)	0.043

CONCLUSIONS

- Exposure to sunlight in winter and summer, on average had a negative relationship with the incidence of the disease in both age groups, which in some cases has been observed specifically.
- Physical activity was only negatively associated with the incidence of the disease in women.

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