

Assessment of Physical Activity and Sun Exposure of Saudi Patients with Type 2 Diabetes Mellitus in Ramadan and Non-Ramadan Periods

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Abstract : Background: Physical activity is an important factor in the treatment and prevention of type 2 diabetes mellitus (T2DM). Reduction in HbA1c level, an important diabetes biomarker, was reported in patients who increased their daily physical activity. Although the ambient temperature was reported to be positively correlated to a negative impact on health and increase the incidences of diabetes, the exposure to bright sunlight was recently found to be associated with enhanced insulin sensitivity and improved beta-cell function. How Ramadan alters physical activity, and especially sunlight exposure, has not been adequately investigated. Aim: This study aimed to assess the physical activity and sun exposure of Saudis with T2DM over different periods (before, during, and after Ramadan) and related this to HbA1c levels. Methods: This study recruited 82 Saudis with T2DM, who chose to fast during Ramadan, from the Endocrine and Diabetic Centre of Al Iman General Hospital, Riyadh, Saudi Arabia. Ethical approvals for this study were obtained from De Montfort University and Saudi Ministry of Health. Physical activity and sun exposure were assessed by a self-administered questionnaire. Physical activity was estimated using the International Physical Activity Questionnaire (IPAQ), while the sun exposure was assessed by asking the patients about their hours per week of direct exposure to the sun, and daily hours spent outdoors. Blood samples were collected in each period for measuring HbA1c. Results: Low physical activity was observed in more than 60% of the patients, with no significant changes between periods. There were no significant variances between periods in the daily hours spent outdoors and the total number of weekly hours of direct exposure to the sun. The majority of patients reported only few hours of exposure to the sun (1h or less per week) and time spent outdoors (1h or less per day). The mean HbA1c significantly changed between periods ($P = 0.001$), with lowest level during Ramadan. There were significant differences in the mean HbA1c between the groups for the level of physical activity ($P < 0.001$), with significant lower mean HbA1c in the higher-level group. There were no significant variances in the mean of HbA1c between the groups for the daily hours spent outdoors. The mean HbA1c of the patients, who reported never in their total weekly hours of exposure to the sun, was significantly lower than the mean HbA1c of those who reported 1 hour or less ($P = 0.001$). Conclusion: Physical inactivity was prevalent among the study population with very little exposure to the sun or time spent outdoors. Higher level of physical activity was associated with lower mean HbA1c levels. Encouraging T2DM patients to achieve the recommended levels of physical activity may help them to obtain greater benefits of Ramadan fasting, such as reducing their HbA1c levels. The impact of low direct exposure to the sun and the time spent outdoors needs to be further investigated in both healthy and diabetic patients.

Keywords : diabetes, fasting, physical activity, sunlight, Ramadan

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