

RESEARCH ARTICLE

Frequency-domain analysis of heart rate variability during rest and stress in adolescents with parental history of diabetes mellitus

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ABSTRACT

Background: Diabetes mellitus (DM) is a polygenic disorder in which hereditary, environmental factors, lifestyle, and other factors play a role. Among this genetic factor plays a crucial role in that, risk of developing DM increases with a strong parental history almost up to 70%. **Aims and Objectives:** Evaluation of frequency domain analysis of Heart rate variability (HRV) during rest and stress in adolescents with a parental history of DM. **Materials and Methods:** A total of 150 adolescents were involved in the study. They were in three groups based on the parental history of DM; Group I - negative parental history (controls); Group II - one parent diabetic; and Group III - both parents diabetic. HRV analyzed by Kubios software. To induce stress, subjects were made to subtract digit by 7 under pressure. **Results:** During rest, there is a statistically significant reduction in frequency-domain parameters such as total power and high frequency (HF) (nu) ($P = 0.00$ and $P = 0.00$) demonstrating decrease in parasympathetic activity. Low frequency (LF) (nu) ($P = 0.00$) and Lebanon Humanitarian Fund ratio ($P = 0.00$) were increased demonstrating elevated sympathetic activity in adolescents of Group III when compared to Groups I and II. Subjects having both the parents diabetic show exaggerated response to acute stress in terms of significant reduction in total power ($P = 0.00$), HF (nu) ($P = 0.00$), and LF (ms²) ($P = 0.00$) and a significant increase in LF (nu) ($P = 0.00$) and LF/HF ratio ($P = 0.00$). **Conclusion:** Reduced autonomic modulation was seen in adolescents having a strong parental history of DM. Even during rest, they showed sympathetic predominance and withdrawal of parasympathetic component. During stress, there is an exaggerated response seen in adolescents of both parents diabetic.

KEY WORDS: Heart Rate Variability; Time Domain Analysis; Diabetes Mellitus; Glucose Intolerance; Mental Stress

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