

The relevant role of family history in predicting type 2 diabetes occurrence

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On June 6, 2019, the *Polish Archives of Internal Medicine* published an interesting article by Szczerbiński et al,¹ entitled “Efficacy of family history, genetic risk score, and physical activity in assessing the prevalence of type 2 diabetes.” This editorial is a commentary on this paper, intending to highlight, one more time, the importance of a positive family history (FH+) of type 2 diabetes (T2D) for estimating diabetes occurrence in the adult population as well as the importance of physical activity (PA) for maintaining optimal body composition and a low incidence rate of chronic disease.² Since 2011, my research group has provided periodical pieces of evidence (2011, 2013, and 2014) about the influence of FH+ on the basal metabolic rate of women,³ on body composition and fasting glucose levels of healthy people,² on body composition and basal glycemia in sedentary people,⁴ and on anaerobic performance of young male elite athletes.⁵

Interestingly, when scientists are going deeper into assessing the relationship between FH+ and biomarkers such as the serum fibroblast growth factor 21,⁶ the effect of FH+ becomes less clear. Davies et al⁶ reported no significant differences between FH+ and FH− for this protein.⁶ Leong et al⁷ have recently published an interesting article regarding the prediction of T2D by glycosylated hemoglobin A_{1c} (HbA_{1c}). They concluded that HbA_{1c} predicts T2D in different common scenarios, proving useful in identifying individuals with an elevated long- and short-term risk of T2D.⁷ Even the race-specific incidence of T2D has been investigated in relation to FH+,⁸ and the African Americans showed a higher prevalence of FH+ than the European Americans. Kral et al⁸ stated that FH+ was almost the “norm” for over half of African American study participants, but the FH+ was not a statistically independent risk factor for T2DM in this population unless multiple family members were known to be affected. The authors advocated further research on genetic, biological, and environmental mechanisms for a better

understanding of the relationship between FH+, races, and ethnicities.⁸

The interesting article by Szczerbiński et al¹ perfectly fits with the scenario mentioned above. The authors investigated FH+, PA, and the genetic risk score (GRS) to examine how PA and stratified levels of genetic susceptibility to T2D co-occur with the prevalence of the disease. They found that FH+ was associated ($P < 0.001$) with a higher prevalence of T2D. These results are in agreement with previous studies⁷⁻¹⁰ and confirm the actual interest of the scientific community in FH+. Moreover, the paper adds relevant data concerning the role of PA and the GRS in FH+, with an interesting sex stratification within the results section. In agreement with Bianco et al,^{2,4,5} the authors found that FH+ was positively associated with a higher prevalence of T2D, as well as with higher values of metabolic parameters, including plasma glucose concentrations, insulin resistance, body mass index, as well as body fat and skeletal muscle content.¹ Concerning the GRS, the authors reported a preference for FH+ (as a risk factor) for the selection of patients at high risk of T2D when compared with the alternative method of GRS. They are still skeptical about the full adoption of the GRS, as they stated that “studies have shown that GRSs constructed with the use of the common genetic variants still offer little improvement in T2D risk prediction compared with established T2D risk factors, including FH.”¹

The environmental factors have also been discussed, and the authors stated that the PA had a key role in T2D occurrence, management, and development, which is in agreement with the reports by Bianco et al,² Mendham et al,¹¹ Boyer et al,¹² and Yuing et al.¹³ However, in this case, owing to the cross-sectional design of the study, it was not possible to establish a stable link between FH+, PA, and T2D progression over time.¹

Finally, it appears evident that modifiable risk factors such as PA levels and nonmodifiable risk factors such as FH+ play an important role in T2D

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prediction and management. Moreover, it seems to be still quite challenging to rely on a defined procedure or process in order to predict T2D occurrence in the general population, with the aim to better plan lifestyle interventions and public health policies.

As previously mentioned, the study by Szczerbiński et al¹ represents an interesting piece of evidence in the field of FH+ for T2D prevention and management. The take-home messages of my editorial can be summarized as follows:

- 1 People with FH+ are at higher risk of developing T2D over time.
- 2 Men with FH+ tend to have a higher body mass index and low cardiorespiratory fitness.
- 3 PA plays a vital role in any case, even when FH+ may determine less beneficial effects of the physical exercise.¹⁴
- 4 GRS approach requires a more in-depth investigation and more data to determine whether and how this methodology can be adequately implemented.
- 5 More resources are required to promote more extensive multi-country studies and proper healthy lifestyle intervention programs.

ARTICLE INFORMATION

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