

A positive family history of cardiometabolic disease is associated with arterial stiffness:

The Malmo Diet Cancer Study

Mikael Gottsäter¹, Abd al-Hakim Fatehali¹, Peter M Nilsson^{1,2}.

¹Department of Clinical Sciences, Lund University, and

²Department of Internal Medicine, Skåne University Hospital, Malmö, Sweden



Conclusion

The results indicate associations between increased AS and a positive FH of both diabetes and hypertension after adjustment for a self-reported history of the respective diagnoses. This shows that FH is a relevant marker of vascular ageing. Adding a GRS for diabetes or hypertension to the multiple regression models did not alter the significance of FH on AS indicating a more comprehensive role of FH than genetic predisposition alone, although this could also be explained by methodological limitations.

Objective

Arterial stiffness (AS) is known to be associated with a number of clinical conditions including hypertension, diabetes and dyslipidemia. AS may also be associated with lifestyle and early life factors, which are greatly affected by family history. The aim of this study was to investigate the association between self-reported family history (FH) and AS.

Design and method

The study population consists of 3056 individuals (mean age 72 years, 40% men) from the population-based Malmo Diet Cancer study, Sweden. Carotid-femoral pulse wave velocity (c-f PWV), a marker of AS, was measured with Sphygmocor®. Data on FH for diabetes, hypertension and cardiovascular (CV) events was retrieved from a questionnaire. Using multiple regression, adjustments were made for age, sex, mean arterial pressure (MAP) and heart rate (HR) in Model 1, and in Model 2 further adjustment made for diagnosed diabetes or hypertension, respectively. In Model 3, the analyses were also adjusted for a genetic risk score (GRS) of type 2 diabetes (48 SNPs) and systolic blood pressure (29 SNPs).

Results

In an unadjusted model AS was associated with a FH of diabetes and CV events. These associations were significant after adjustment in Model 1, Model 2 and Model 3. FH of hypertension was significantly associated with AS in adjusted analyses only.

FH of diabetes was significantly associated with AS among non-diabetics (Model 1) but FH of hypertension lost its significance after stratification for self-reported hypertension.

Table: Association between family history of diabetes, hypertension and CV events with c-f PWV in unadjusted and adjusted models.

Family history	Unadjusted		Model 1		Model 2		Model 3	
	r	p	β	p	β	p	β	p
- Diabetes	0.063	0.002	0.063	<0.001	0.033	0.04	0.033	0.048
- Hypertension	0.017	0.39	0.054	0.001	0.034	0.04	0.039	0.02
- CV-events	0.091	<0.001	0.062	<0.001	n.a.	n.a.	n.a.	n.a.

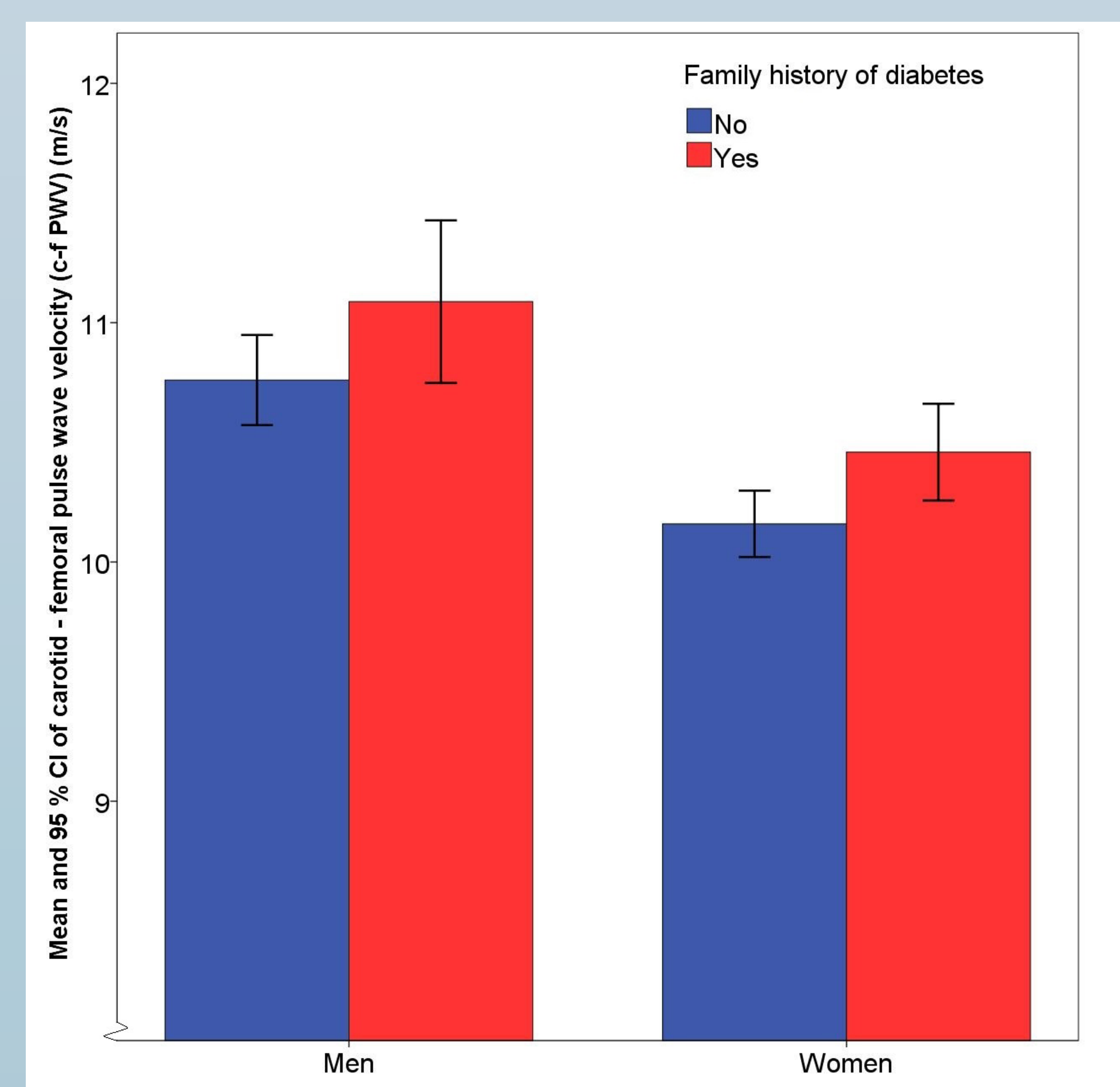


Figure 1: Mean and 95 % confidence interval of c-f PWV in individuals with and without a family history of diabetes, stratified for gender.

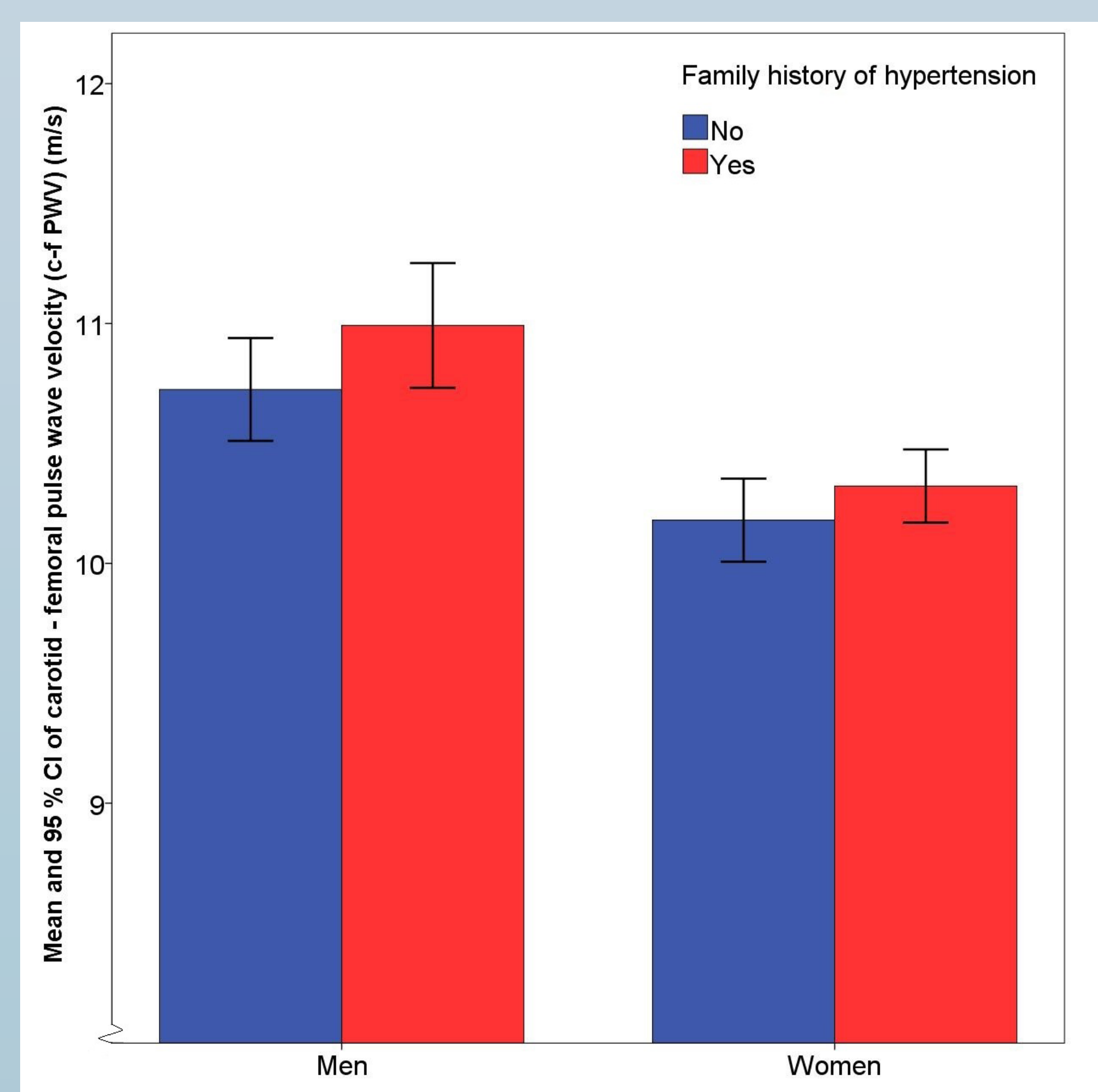


Figure 2: Mean and 95 % confidence interval of c-f PWV in individuals with and without a family history of hypertension, stratified for gender.

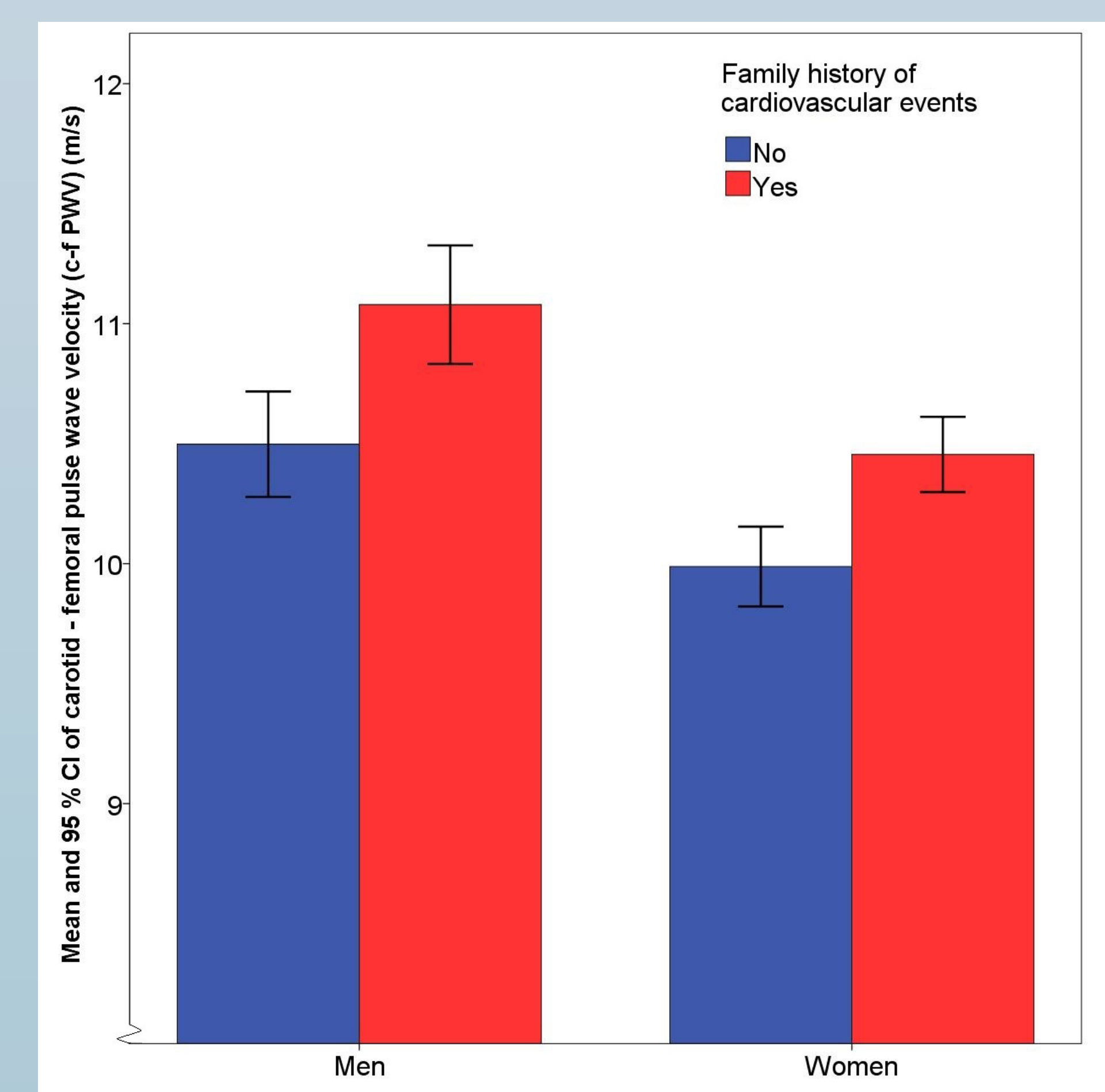


Figure 3: Mean and 95 % confidence interval of c-f PWV in individuals with and without a family history of cardiovascular events (stroke or MI), stratified for gender.

References

Gottsäter M, Ostling G, Persson M, Engström G, Melander O, Nilsson PM. Non-hemodynamic predictors of arterial stiffness after 17 years of follow-up: the Malmo Diet and Cancer study. J Hypertens. 2015; 33:957-965.

Rosvall M, Persson M, Ostling G, Nilsson PM, Melander O, Hedblad B, et al. Risk factors for the progression of carotid intima-media thickness over a 16-year follow-up period: The Malmo Diet and Cancer Study. Atherosclerosis. 2015; 239:615-621

