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Dietary pattern associations with age at natural menopause in the UK women's cohort study

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Background British women spend around one third of their life post-menopausally. The timing of menopause has been linked to several chronic diseases. Evidence shows an association between a later menopause and reduced risk of cardiovascular diseases and osteoporosis, and a higher risk for endometrial, ovarian and breast cancer. It is hypothesized that diet can influence the timing of natural menopause. However, studies reporting this association are limited and contradictory. This study aimed to investigate the prospective association between dietary patterns derived from two different methods and age at natural menopause.

Methods Menopausal status was reported at two time points 4 years apart in the UK Women's Cohort Study. Natural menopause was defined as the permanent cessation of menstrual periods for at least 12 consecutive months. A 217-item food frequency questionnaire was used to measure diet of participants at baseline. Principal component analysis (PCA) and reduced ranked regression (RRR) were used to identify dietary patterns for 13 916 women. Cox proportional hazards regressions were used to estimate hazard ratios (HR) and 95% confidence intervals (CIs) for each pattern in relation to age at natural menopause, adjusting for potential confounders (smoking status, ethanol intake, education level, social class, physical activity level and age at baseline). All analyses were conducted using Stata 14.

Results Five patterns were identified from the PCA which accounted for 16% of variance in dietary intake. These were labelled: 'vegetables and legumes', 'animal proteins', 'fruits', 'fats and sweets' and 'low-fat products'. Three patterns were derived from RRR (29% of the total variance): 'sweets, pastries and puddings', 'low-fat dairy and meat', and 'red meat and processed meat'. Women who scored higher on the 'animal proteins' pattern were 6% less likely to have gone through a natural menopause (HR: 0.94, 95% CI 0.90 to 0.97) compared to those who scored lower. The 'red meat and processed meat' pattern predicted a 7% higher risk for a later natural menopause (HR: 0.93, 95% CI 0.87 to 1.00). No evidence of an association was observed between the other dietary patterns and incidence of being naturally menopausal.

Conclusion This is the first study demonstrating a link between dietary patterns and age at natural menopause. Both PCA and RRR are useful in deriving dietary patterns which can influence the onset of natural menopause. RRR provided a more useful insight for the association between dietary patterns and the timing of menopause in comparison to PCA. These findings will contribute to an improved understanding of the timing of natural menopause in relation to diet, which may also have implications associated with longer term health outcomes in post-menopausal women.

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