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Associations of pulse-rich diets with risk of cancer incidence and mortality: findings from the UK Biobank prospective cohort study

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Approximately 25% of deaths in the UK are caused by cancer⁽¹⁾. Studies have reported a lower risk of all site cancers, and specifically kidney, stomach, oesophagus, colorectal, oropharyngeal, and upper aerodigestive cancers in higher consumers of pulses compared to low consumers⁽²⁾. However, findings are inconsistent with others showing no association⁽³⁾. In view of the limited studies conducted to date, the objective of this data analysis was to assess the association of pulse-rich diets (beans, chickpeas, and lentils) with cancer incidence and mortality in UK adults.

This prospective cohort study of the UK Biobank included 115,011 participants (55%, n = 62,977 females) aged 40-70 years at recruitment (2006 and 2010) who had undertaken at least two complete 24-hour dietary recalls and were followed up until 2022. Participants with cancer at baseline, extreme dietary energy intakes, or pregnant were also excluded from the analysis. Pulse consumption was split as non-consumers (NC, 0g/day, n = 73,266), and three tertiles (T) according to the level of pulse intake (T1: 1-20.4g/day, n = 14,035; T2: 20.5-40.4g/day, n = 13,509; and T3: 40.5360g/day, n = 14,161). Using Cox proportional hazard models, the hazard ratios (HR) of the effect of pulse consumption on total and multi-site cancer incidence and mortality was conducted with sex, age, dietary energy, region, ethnicity, income, employment, smoking status, education, exercise level, body mass index (BMI), supplement use, alcohol intake, family history of cancer, intake of fruits and vegetables, processed meat, and dietary fibre as covariates in the fully adjusted model as appropriate for the cancer site.

The cohort had a mean \pm SD age of 55.9 \pm 7.0 years, BMI of 26.7 \pm 4.6 kg/m² and pulse intake of 13.3 \pm 20.5g/day. White people (n = 110,890, 96.4%) had the lowest mean \pm SD pulse intake compared to all other ethnicities (13.2 \pm 24.4g/day vs 17.0 \pm 27.7g/day, p < 0.001 respectively). After a mean follow-up of 12.4 years, there were 3281 cancer deaths and 17,415 incidences of cancer. There were inverse associations of pulse intake with the incidence of liver cancer (HR 0.39; 95% CI: 0.17, 0.90) and thyroid cancer (HR 0.40; 95% CI: 0.16, 0.99) in T2 compared to NC for both sexes and in NC compared with T1 for breast cancer in females (HR 0.55; 95% CI: 0.36, 0.86). No associations were observed for other cancer sites or for cancer mortality.

Compared with NC, our findings suggest that diets with an intake of pulses up to 40.4g/day are associated with lower incidence of liver, thyroid, and female breast cancer but not other cancers or mortality. The lack of association between diets containing higher pulse intake with cancer incidence and mortality was unexpected and suggestive of effects of other dietary components, studies on the dose dependent effects and types of pulse intake on cancer incidence and mortality are needed.

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References

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