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Risk of hip fracture in vegetarians and meat-eaters: results from the UK Biobank

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Hip fracture affects 8.1 million women and 6.1 million men annually(1) . Plant-based diets may adversely affect musculoskeletal health and increase risk of fractures, but prospective evidence on risk of hip fracture in vegetarians and meat-eaters is limited. We aimed to investigate the risk of hip fracture in occasional meat- eaters, pescatarians, and vegetarians compared to regular meat-eaters in the UK Biobank, and to explore the role of anthropometric and biomarker factors as potential mediators of any observed risk differences.

Middle-aged British adults were classified as regular meat-eaters (≥ 5 servings/week; n = 258,765), occasional meat-eaters (< 5 servings/week; n = 137,954), pescatarians (ate fish but not meat; n = 9557), or vegetarians (did not eat meat or fish; n = 7638) based on dietary and lifestyle information at recruitment (2006–2010). Incident hip fractures were identified by record linkage to Hospital Episode Statistics up to September 2021. Multivariable Cox regression models were used to estimate associations between each diet group and hip fracture risk, with regular meat-eaters as the reference group, over a median follow-up time of 12.5 years.

Among 413,914 women, 3503 hip fractures were observed. After adjustment for confounders, vegetarians (HR (95% CI): 1.50 (1.18, 1.91)) but not occasional meat-eaters (0.99 (0.93, 1.07)) or pescatarians (1·08 (0·86, 1·35)) had a greater risk of hip fracture than regular meat-eaters, equivalent to an adjusted absolute rate difference of 3.2 (1.2, 5.8) more hip fractures per 1000 people over 10 years in vegetarians. There was limited evidence of effect modification by body mass index (BMI) on hip fracture risk across diet groups (pinteraction = 0.08), and no clear evidence of effect modification by age or sex (p-interaction = 0.9 and 0.3, respectively). In causal mediation analyses, the lower average BMI in vegetarians compared to regular meat-eaters (adjusted means: 25.9 kg/m2 vs 27.7 kg/m2) explained 28% of the difference in hip fracture risk (95% CI: 1%, 70%). There was no clear mediation effect for fat-free mass, serum vitamin D, or serum insulin-like growth factor 1 levels.

Vegetarian men and women had a higher risk of hip fracture than regular meat-eaters, and this was partly explained by their lower BMI. However, absolute risk differences were modest, and should be weighed against the potential health benefits of vegetarian diets.

Reference

1. Wu AM, Bisignano C, Asmare WN et al. (2021) Lancet Healthy Longev 2(9), 580–59.