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What's new for the clinician– summaries of recently published papers

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INTRODUCTION

At the 74th session of the World Health Assembly held from 24 May to 1 June 2021, the World Health Organisation (WHO) approved a landmark resolution on oral health. The resolution recognized the global burden of oral diseases and their associations with other conditions, urging Member States to address shared risk factors, enhance the professional capacity of oral health professionals to deliver consistent and quality care, and to include oral health in universal health coverage (UHC) benefit packages. It also requested WHO to develop a global strategy and action plan on oral health with 2030 targets, among other follow-up actions. In support of this resolution, the FDI and International Association for Dental Research (IADR) urged Member States to adopt the proposed resolution and strengthen its implementation by:

1. Addressing orofacial clefts, access to affordable fluoridated toothpaste, and community-based fluoridation where relevant, as advised by the updated DG's report.
2. Promoting dental research to strengthen evidence on prevention, oral health disparities, oral disease associations with other NCDs such as diabetes, heart disease, stroke, kidney disease, mental and neurological disorders, chronic respiratory diseases, and cancers; and research into full alternatives to dental amalgam, being affordable and accessible.
3. Meaningfully engaging people living with oral diseases, oral health professionals, national dental associations, and other civil society organizations in oral health programmes.
4. Ensuring that future processes, such as the proposed resolution on Diabetes and the upcoming 2023–2030 NCD implementation roadmap, integrate and align with the resolution on Oral health.

In light of this acknowledgement of the link between oral health and general health, the next few series of evidence based in clinical practice columns will review the evidence of the link between diet and general health and diet and oral health.

1. Meat consumption and risk of ischemic heart disease: A systematic review and meta-analysis

There is uncertainty regarding the association between unprocessed red and processed red meat consumption and the risk of ischemic heart disease (IHD), and little is known regarding the association with poultry intake. The aim of this systematic review and meta-analysis was to quantitatively assess the associations of unprocessed red, processed meat, and poultry intake and risk of IHD in published prospective studies.

METHODOLOGY

Nine electronic databases and the reference lists of included articles, systematic reviews and meta-analyses were used as sources of potential papers for inclusion for this review. The search terms for this review included beef (including hamburger), lamb, veal, goat, pork, horse meat, mutton, venison, boar, hare, rabbit, game, sausage, ham, bacon, pastrami, deli/luncheon meat, nuggets, chicken, turkey, geese, and duck; IHD, coronary heart disease or coronary artery disease (includes angina pectoris, myocardial infarction (MI) [fatal and/or non-fatal. No language restrictions were applied.

Two authors reviewed the titles and abstracts of all articles and included studies that met the following criteria: 1) prospective cohort design, 2) peer-reviewed (except if uploaded on preprint servers), 3) available in full-text, and 4) assessed the relationship between 1(+) meat types and IHD. The meat types included were unprocessed red meat, processed meat, and poultry. Where no composite unprocessed red meat estimate was given, estimates for single meat type (e.g. beef) were used if these were distinctively separate from processed meat.

If more than one unprocessed red meat type was provided (e.g. pork and beef), both were used in separate analyses. Processed meat was defined as a composite by studies without restrictions to the definition. Poultry included either only unprocessed poultry or poultry including processed poultry, whichever was reported. The authors excluded prospective studies based on broader dietary patterns (e.g. vegetarian diets, data-derived dietary patterns, dietary

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indices) if they did not report single meat item results and studies that investigated total meat or other meat types only. Where two or more studies were based on the same cohort, the study with the largest number of cases was included. Any disagreement was resolved through discussion.

Three authors extracted the study information independently. Where multiple outcomes were reported within one study, the outcome that provided the largest case numbers was used; where separate estimates were available for men and women, these were pooled in the meta-analyses

The three authors also assessed the risk of bias using the Newcastle-Ottawa Quality Assessment Scale for cohort studies by assigning one point each for 1) study representativeness (only counting population based-cohorts), 2) using a validated tool of dietary assessment, 3) adjusting for at least age, sex, smoking, physical activity and some measure of socioeconomic status (e.g. income, occupation, education), 4) ascertaining or verifying outcome information using record linkage, and 5) having over two years of total follow-up to reduce the risk of reverse causality. Studies were considered high quality if they met at least 4 of the 5 criteria.

Fixed-effects models were used to calculate summary relative risks (RRs) and 95% confidence intervals (CIs) for dose-response meta-analyses.

RESULTS

From the initial search where more than 2170 records were identified for potential inclusion, a total of 13 cohort studies including 1,437,989 individuals and 32,630 cases were included. The studies were conducted in Asia (n = 3), the US (n = 4), Australia (n = 1), Europe (n = 4), and for one multi-country cohort in the Americas, Asia, Africa and Europe. Most studies included predominantly middle-aged or older adults at baseline. The maximum follow-up time ranged from 6–30 years. Meat intake categories varied, with unprocessed red meat intake in the lowest intake category ranging from 0–25 g/day and in the highest from 10–141 g/day; processed meat from 0–10 g/day to 9–78 g/day; and poultry from 0–12 g/day to 22–68 g/day

Unprocessed red meat intake and IHD

The summary RR of IHD for each 50 g/day intake of unprocessed red meat consumption was 1.09 (95% CI, 1.06 to 1.12), based on 16 estimates from 12 studies. Simply put, there was a 9% increased risk of developing IHD among those individuals who consumed an average of 50 g/day of unprocessed red meat compared to those that did not.
Processed meat intake and IHD

The summary RR of IHD for each 50 g/day intake of processed meat was 1.18 (95% CI 1.12 to 1.25), based on 12 estimates from ten studies. There was a 18 % increased risk of developing IHD among those individuals who consumed an average of 50 g/day of unprocessed red meat compared to those that did not.

Poultry intake and IHD

The summary RR of IHD for each 50 g/day intake of poultry was 1.02 (95% CI 0.97 to 1.07), based on 14 estimates from ten studies. Since the 95% CI crossed the line of no effect (RR=1), it can be concluded that there is no association between poultry intake at 50g/day and IHD.

CONCLUSIONS

This large meta-analysis of meat intake and IHD risk shows that unprocessed red and processed meat might be risk factors for IHD. This supports public health recommendations to reduce the consumption of unprocessed red and processed meat intake for the prevention of IHD.

Implications for practice

These results imply that oral health professionals need to consider the health benefits/risks of the different food groups when giving dietary advice to their patients to promote better oral/general health. The advice for moderation when consuming red meats (processed and unprocessed) and alternatively choosing poultry as a healthier option seems sensible.

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2. Vegetarian, vegan diets and multiple health outcomes: A systematic review with meta-analysis of observational studies

Vegetarian diet, defined as a dietary profile characterized by abstention from consuming meat and meat products, poultry, seafood and flesh from any other animal, is experiencing a considerable popularity in the general population in many parts of the world. [1] In the recent years though, due to popular culture and famous sporting icons adopting this diet, veganism is also attracting thousands of followers worldwide. The vegan diet is characterised by the total exclusion of any animal-derived substance from the daily food intake. Dino and colleagues (2017)[1] reported on a comprehensive systematic review with meta-analysis of all cross-sectional and cohort studies hitherto published in order to obtain an estimate of the association between vegetarian, vegan diets, and multiple health outcomes, including risk factors for chronic diseases, risk of all-cause mortality, incidence and mortality from cardio-cerebrovascular diseases, total cancer and specific types of cancer.

METHODOLOGY

The review question was structured using the following elements—Population of interest (P); Intervention (I); Comparisons (C); Outcome (O); and Time frame (T)—namely, the PICOT format. For this study Setting (S) was also included. A structured search strategy was developed and run through Medline, Embase, Scopus, The Cochrane Library, and Google Scholar. Additional searches were conducted by scanning references of the identified articles, reviews and meta-analyses. The search was limited to human studies. When multiple articles for a single study were present, we used the latest publication and supplemented it, if necessary, with data from the most complete or updated publication. Eligible studies included any observational study conducted in humans (i.e., cross-sectional studies, case-control, nested case-control, or case-cohort design) that reported a measure of association (such as hazard ratios or incident rate ratios for prospective studies) between vegetarian or vegan diet, assessed by questionnaires, and risk factors for chronic degenerative diseases [body mass index (BMI), total cholesterol, LDL cholesterol, HDL-cholesterol, triglycerides, blood glucose], risk of all-cause mortality, incidence and mortality from cardiocerebrovascular diseases, total cancer and specific types of cancer, confirmed by medical records or registry linkage. The decision to include studies was hierarchical and initially made on the basis of the study title, then of the study abstract, and finally of the complete study manuscript.

Eligible studies were included if they met the inclusion criteria for study design, study population (clinically healthy subjects 18 years old), exposure (vegetarian diet, defined as a diet excluding meat and meat products, poultry, seafood and flesh from any animal; vegan diet, defined as a diet that omit all the animal-derived products), reference group (omnivore diet, defined as a diet consuming all types of foods including meat and meat-products, poultry, seafood and flesh from any animal), outcome and statistics (sufficient data to allow calculation of differences between individuals consuming a vegetarian or a vegan diet and those consuming an omnivore diet).

Two reviewers independently extracted data from all the studies fulfilling the inclusion criteria and any disagreement was resolved by consensus. The methodological quality of the trials included was assessed using elements of the Newcastle-Ottawa Scale (NOS) for assessing risk of bias in observational studies. Review Manager (RevMan, version 5.3) was used to pool data for each risk factor and outcome of interest. The authors conducted pooled analyses using the generic inverse variance method with random-effects weighting. For cross-sectional studies, the weighted mean differences (WMD) was calculated between the subjects following vegetarian or vegan diet and those following an omnivore diet with 95% confidence intervals (CIs). With regard to prospective studies, pooled results were reported as relative risks (RRs) and presented with 95% CIs. $P < 0.05$ was considered statistically significant.

RESULTS

Overall, a total of 108 articles were finally included in the meta-analysis.

Cross-sectional studies

The overall analysis comprised a total number of 56,461 vegetarians and 8,421 vegans compared with 184,167 omnivorous and the mean age varied widely, ranging from 18 to 81 years old. The risk-of-bias assessment for each cross-sectional study included in the meta-analysis reported a low risk of bias only in 2 studies, whereas in the others a moderate-to high risk was present. At the overall analysis, vegetarian diet was significantly associated with lower BMI (-1.49), serum total cholesterol (-28.16 mg/dL), LDL-cholesterol (-21.27 mg/dL), HDL-cholesterol (-2.72 mg/dL), serum triglycerides (-11.39 mg/dL), and blood glucose levels (-5.08 mg/dL) with respect to omnivores. Similarly, vegan diet reported significantly lower BMI (-1.72), serum total cholesterol (-31.02 mg/dL), LDL-cholesterol (-22.87 mg/dL), and blood glucose levels (-6.38 mg/dL), but nonsignificant lower HDL-cholesterol and triglycerides with respect to omnivores.

Prospective cohort studies

The overall analysis for all the different clinical outcomes comprised a total number of 72,298 vegetarians followed for a period ranging from 4.1 to 21 years. One study included only women and 8 studies included men and women. The risk of-bias assessment for the included study reported a low risk of bias in 4 studies and a moderate risk for the remaining.

The association between vegetarian diet and all-cause mortality included 66,018 vegetarians and 8,216 deaths and was found to be nonsignificant (P = 0.24) with an RR of 0.94 (95% CI 0.86 to 1.04) and a significant heterogeneity (I 2 D 83%; P < 0.001).

For vegans and all-cause mortality, the risk ratio was 0.88 (RR 0.88, 95% CI 0.75 to 1.02; P = 0.42) and similar non-significant association was found.

No significant association (P = 0.07) was also found among vegetarians when incidence and/or mortality from cardiovascular diseases were taken as a unique outcome (RR 0.93, 95% CI 0.86 to 1.00). However, when incidence and/or mortality from ischemic heart disease were analyzed separately, vegetarian diet was found to be significantly (p < 0.001) associated with the outcome, with a reduced risk of -25% (RR 0.75, 95% CI 0.68 to 0.82), while nonsignificant (P =0.39) association for incidence and/or mortality from cerebrovascular disease (RR 0.93, 95% CI 0.78 to 1.10) was observed. With regard to incidence of total cancer, meta-analytic pooling under a random-effects model showed significant (P = 0.002) lower risk of cancer among vegetarians (RR 0.92, 95% CI 0.87 to 0.98) and vegans (RR 0.85 95% CI 0.75 to 0.95). Finally, by analyzing different localizations of cancer, nonsignificant reduced risk of incidence of breast cancer (RR 0.94, 95% CI 0.84 to 1.06), as well as mortality from colorectal (RR 0.90, 95% CI 0.76 to 1.05), breast (RR 0.94, 95% CI 0.56 to 1.58), prostate (RR 0.90, 95% CI 0.63 to 1.29) and lung (RR 0.86, 95% CI 0.62 to 1.19) cancer was reported when vegetarians were compared to omnivores.

CONCLUSIONS

The authors attempted to give some answers to common questions such as: are the vegetarian and vegan diets associated with a protection against cardiovascular and cancer disease? From the analysis of the studies available in the literature it was determined that a significant protection against ischemic heart disease and cancer is present in vegetarian subjects, but that this protection is not significant for overall mortality, cardio and cerebrovascular diseases when compared to omnivores. In addition, vegan diet seems to be associated with a lower rate of cancer incidence in general but this result must be interpreted with caution, because of the very small sample size and the low number of studies evaluating this aspect.

Implications for practice

A key function or oral health professionals is to provide dietary advice to patients. It is important that we are aware of the evidence (quality and quantity) of the health benefits of following a vegetarian or vegan diet so that our advice to our patients is not contradicted by other health professionals such as doctors or nutritionists.

REFERENCE

1. Dinu M, Abbate R, Gensin GF, Casini A, Sofi F. Vegetarian, vegan diets and multiple health outcomes: A systematic review with meta-analysis of observational studies, Critical Reviews in Food Science and Nutrition, 2017; 57: 3640-3649.

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CPD questionnaire on page 312

The Continuous Professional Development (CPD) section provides for twenty general questions and five ethics questions. The section provides members with a valuable source of CPD points whilst also achieving the objective of CPD, to assure continuing education. The importance of continuing professional development should not be underestimated, it is a career-long obligation for practicing professionals.