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Editorial

Food for Thought: A "Low-Tech" Road to Improved Primary Cardiovascular Prevention: Adherence to Dietary Guidelines

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See article by Brassard et al., pages 1665–1673 of this issue.

Cardiology is increasingly becoming a subspecialty of "high tech" interventions. We rightly marvel at our ability to jackhammer through complete coronary occlusions, percutaneously tighten a leaky valve, and freeze or fry pesky electrical circuits. But are we losing our ability to listen to patients and seek out the "low tech" information, which is undoubtedly, at least partially, at the origin of their need of "high tech" interventions.

In this issue of the *Canadian Journal of Cardiology*, Brassard et al.[1] report results from the **Prédi**cteurs **I**ndividuels, **S**ociaux et **E**nvironnementaux (PREDISE) survey, which aimed to provide dietary intake estimates and assess dietary guideline adherence among French-speaking Quebec adults. This is a primarily descriptive study of a multicentre cross-sectional survey using a Web-based approach to collect individual, social, and environmental data on factors associated with adherence to dietary recommendations. Self-reported dietary intake was estimated from the average of 3 validated Web-based 24-hour recalls. The authors recruited 1149 participants, with an average age of 42.6 ± 4.7 years with a median body mass index of 26.3 (interquartile range, 23.3-30.3). They reported that < 25% of participants met Canada's Food Guide recommendations for vegetables and fruit intake and > 75% consume more than the recommended intake of sodium and saturated fat. The authors logically conclude that there is a low adherence to current Canadian dietary guidelines. The authors claim these results "emphasize the need for more effective nutrition-focused public health policies to maximize cardiovascular disease prevention at the population level."

Although I found the article to be well written with a clear coherent message, recent commentaries about the fragility and limitations of nutritional epidemiology should prompt the prudent reader to perform a critical assessment of the study's validity.[2] Cumulative biases, including residual confounding, multiple testing, inadequate exposure classification, and selective reporting have lead to almost foods being associated with increased risk including implausibly high effect sizes, such as eating 12 hazel nuts daily prolonging life by 12 years![2]

However, the measuring tool in this study, a newly developed automated self-administered Web-based 24-hour dietary recall (R24W), has been previously validated in earlier studies suggesting improved bias control.[3] These previous R24W studies showed that participants were able to reliably report most items and portion size of items they ate. To further reduce random errors, the present study used an average of 3 R24Ws.

The study validity for the R24W questionnaire is further confirmed for sodium intake by a comparison with a study of the Canadian **P**rospective and **U**rban **R**ural **E**pidemiology (PURE) cohort,[4] which used 24-hour urine collection, considered the gold standard approach for estimating sodium intake. Those authors reported that only 28.6% of the Canadian population consumed < 2400 mg/d of sodium.[4] When it is acknowledged that Quebec participants in that study had a distribution curve for sodium consumption slightly right-shifted from the overall curve and that the present study used a 2300 and not a 2400 mg/d cut point, it can be appreciated that there is a fairly close correspondence between the estimates of the numbers of individuals meeting guideline sodium recommendations in the current study compared with estimates using the gold standard. A large epidemiologic study of patients in enrolled from 21 countries in 5 continents has also confirmed that only a small percentage of patients have a sodium intake < 2300 mg/d. Provocatively, this study reports an increased cardiovascular risk not only in those in the highest (> 5 g/d sodium) or but also in the lowest tertile.

The astute reader might also be concerned about the generalizability of the current results because the study included only those with Internet access. However, it is possible to make a qualitative estimate of any bias that this sampling frame introduced. Those without Internet access represent the economically poorest layer of our society and because of the well established association between low socioeconomic status and poor dietary habits, the study estimates of dietary adherence to guidelines are likely to be an overestimate of true population adherence rates.

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Nutritional epidemiology continues to be a highly researched scientific area but, as discussed previously, much uncertainty surrounds the inferences that can be reliably drawn even from largely observational data sets. Because guidelines are often derived from observational studies, it is not surprising that health care professionals and the general public are often skeptical about the strength of their recommendations. Consider, the recent PURE publication,[5] of a large multinational cohort study of > 135,000 individuals with almost 11,000 cardiovascular outcomes, which has shown that increased dairy consumption was associated with lower risk of mortality and major cardiovascular disease. In contrast with this evidence, the Canadian food guide recommends a maximum of 2-3 servings of milk and alternatives. The discordance between this new evidence and guidelines might be at least partially explained by an attempt to implicate a single macronutrient, saturated fatty acids, via a single cardiovascular risk marker, low-density lipoprotein cholesterol, without consideration of possible pleiotropic disease mechanisms including such futuristic avenues as the gut microbiome.

Poor diets do lead to obesity, a recognized cardiovascular risk factor, but are also importantly clustered with several intermediate risk factors including smoking, elevated blood pressure, lipids, and diabetes thereby exponentially increasing overall risk. In this regard, an intriguing hypothesis[6] is that improved outcomes can be obtained not by simply concentrating on reducing weight through caloric restriction, but by intervening on these mediator steps via micronutrients, reducing waist circumference, increasing fitness through improved nutritional quality, and other positive lifestyle changes. This hypothesis has been at least partially confirmed in a recent randomized controlled trial,[7] which showed that an energy-unrestricted Mediterranean diet supplemented with either extra-virgin olive oil or nuts resulted in a risk reduction of approximately 30%, among high-risk persons who were initially free of cardiovascular disease, compared with a control diet only on the basis of advice to reduce dietary fat.

Of course, adherence is only 1 step to consuming a heart-healthy diet. As was pointed out in a recent review,[8] other factors that influence individuals to consume a low-quality diet are myriad including a lack of awareness, knowledge, and availability. More upstream factors leading to a poor diet are socioeconomic from limited financial resources, ill-advised social and cultural norms, and excessive marketing of poor-quality or junk foods. The present study observed consistent and expected associations between diet quality, obesity, and socioeconomic status. Consequently, Virchow's famous quote "Medicine is a social science, and politics is nothing more than medicine on a large scale" again seems germane.

The authors' conclusions about the need for more effective nutrition-focused public health policies to maximize cardiovascular disease prevention at the population level are very reasonable. The ultimate goal is not merely to enhance awareness/adherence of constantly evolving food guidelines but to avoid further marginalization of the most deprived of our society by providing them with the educational and economic means to overcome existing nutritional barriers. Specific interventions, for example, enhanced accessibility to primary nutritional consultancies and increased funding for public food banks, to overcome these barriers are beyond the scope of this editorial. Clearly, an awareness of the issues is a necessary prerequisite for any meaningful advances; food for thought, in our quest to improve public health initiatives for the primary prevention of cardiovascular disease.

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