Evidence-Based Nursing Online First, published on February 7, 2011 as 10.1136/ebn1143

Systematic review with meta-analysis

Higher consumption of sugar-sweetened beverages is associated with increased risk of developing type 2 diabetes or metabolic syndrome

Jackie Sturt

10.1136/ebn1143

Health Sciences Research Institute, Warwick Medical School, University of Warwick, Coventry, UK

Correspondence to:
Jackie Sturt
Health Sciences Research Institute, Warwick Medical School, University of Warwick, Coventry CV4 7AL, UK;
jackie.sturt@warwick.ac.uk

Commentary on: **Malik VS**, Popkin BM, Bray GA, *et al.* Sugar-sweetened beverages and risk of metabolic syndrome and type 2 diabetes: a meta-analysis. *Diabetes Care* 2010;**33**:2477–83.

Sugary drink consumption associated with obesity

The consumption of sugar-sweetened beverages (SSBs) has increased worldwide in the last four decades. In the USA, there has been a twofold increase, and in developing countries such as India and China, Coca Cola reported a 14% and 18% sales increase respectively in 2007 alone. The list of sugar-sweetened drinks comprises sodas or fizzy drinks, fruit drinks and energy and vitamin water drinks and excludes 100% fruit juices not blended with sweetening agents such as sucrose, high-fructose corn syrup or fruit juice concentrates. Health experts are calling for a reduction in consumption of SSBs because of the increasing evidence of association between SSB consumption and obesity in children and adults.[1] Furthermore, association between habitual SSB consumption and metabolic syndrome and type 2 diabetes is gaining momentum.[2]

Does high SSB consumption lead to type 2 diabetes?

Malik and colleagues searched MEDLINE for English language articles from 1966 to May 2010 for prospective cohort studies of intake of SSBs. MEDLINE is not the only database relevant to this subject, and it is possible that inclusion of CINAHL searches may have revealed additional studies. The authors did identify key investigators to approach for grey literature, however. Major colloquial key words such as *soda* and *soda-pop* search terms were used in addition to appropriate dietetic terms such as SSB, although the term *soda* would not have been recognised in the UK literature, and it is not stated whether they included the search term *fizzy drink*. They focused on long-term non-experimental studies with end points of type 2 diabetes or metabolic syndrome with the extreme quartiles of SSB consumption being of primary interest. That is, those who consumed ≤1 12 oz serving a month (lowest consumption quartile), and those who consumed ≥1 or 2 12 oz servings a day (highest consumption quartile).

Over 300 000 participants' data suggest YES!

Eight studies were included looking at type 2 diabetes and three that examined the impact of SSBs on metabolic syndrome. Meta-analysis of the three metabolic syndrome study data sets was undertaken, although three studies with the degree of heterogeneity described could be considered too small to aggregate.[3] However, analysis of the eight type 2 diabetes studies, which involved more than 310 000 participants, does appear to clearly indicate an association between high and habitual SSB consumption of 1–2 12 oz servings per day and the development of type 2 diabetes in both men and women, with an excess risk of developing type 2 diabetes of 26%. The random effects analysis model used does appear to be the most appropriate given the between study heterogeneity that existed. Follow-up periods ranged between 4 and 20 years, and as participants represented the USA, Europe and Asia, it would appear to be an international metabolic response to habitual SSB consumption. Self-report food frequency questionnaires were the outcome measure used in seven of the eight type 2 diabetes studies. Self-completion questionnaires are susceptible to observer bias, but participants would be more likely to under-report and so the 26% excess risk associated with SSB consumption does have strong face validity.

Health behaviour change in SSB consumption

Knowledge is an important first step in contextualising a behavioural risk, but it stands very far from the actual solution. The research team importantly prioritised finding a yes or no answer to the research question as oppose to understanding the dose-related effects. Understanding the trajectory of change in risk of being diagnosed with type 2 diabetes associated with step changes in consumption behaviour would aid clinicians to use behavioural science to help people understand the degree of the risk and develop strategies for increasing their self-efficacy for SSB consumption reduction. Investigations of those middle two quartiles of SSB consumption behaviour are crucial to this.

Competing interests None.

References

1. **Malik VS**, Schulze MB, Hu FB. Intake of sugar-sweetened beverages and weight gain: a systematic review. *Am J Clin Nutr* 2006;**84**:274–88.
2. **Malik VS**, Popkin BM, Bray GA, *et al.* Sugar-sweetened beverages, obesity, type 2 diabetes mellitus, and cardiovascular disease risk. *Circulation* 2010;**121**:1356–64.
3. **Alam R**, Sturt J, Lall R, *et al.* An updated meta-analysis to assess the effectiveness of psychological interventions delivered by psychological specialists and generalist clinicians on glycaemic control and on psychological status. *Patient Educ Couns* 2009;**75**:25–36.

Higher consumption of sugar-sweetened beverages is associated with increased risk of developing type 2 diabetes or metabolic syndrome

Jackie Sturt

Evid Based Nurs published online February 7, 2011
doi: 10.1136/ebn1143