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Glycemic impact of non-nutritive sweeteners: a systematic review and meta-analysis of randomized controlled trials

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Abstract

Background/objectives Nonnutritive sweeteners (NNSs) are zero- or low-calorie alternatives to nutritive sweeteners, such as table sugars. A systematic review and meta-analysis of randomized controlled trials was conducted to quantitatively synthesize existing scientific evidence on the glycemic impact of NNSs.

Subjects/methods PubMed and Web of Science databases were searched. Two authors screened the titles and abstracts of candidate publications. The third author was consulted to resolve discrepancies. Twenty-nine randomized controlled trials, with a total of 741 participants, were included and their quality assessed. NNSs under examination included aspartame, saccharin, steviosides, and sucralose. The review followed the PRISMA guidelines.

Results Meta-analysis was performed to estimate and track the trajectory of blood glucose concentrations over time after NNS consumption, and to test differential effects by type of NNS and participants' age, weight, and disease status. In comparison with the baseline, NNS consumption was not found to increase blood glucose level, and its concentration gradually declined over the course of observation following NNS consumption. The glycemic impact of NNS consumption did not differ by type of NNS but to some extent varied by participants' age, body weight, and diabetic status.

Conclusions NNS consumption was not found to elevate blood glucose level. Future studies are warranted to assess the health implications of frequent and chronic NNS consumption and elucidate the underlying biological mechanisms.

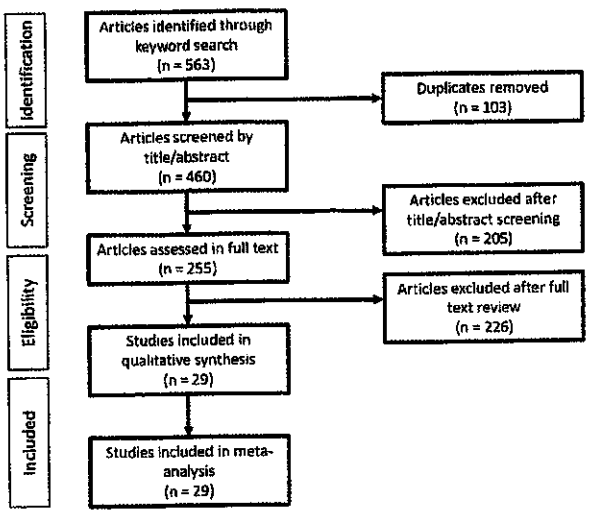

Fig. 1 Study selection flowchart