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Caffeine ingestion and fluid balance: a review



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Abstract:

Background

Caffeine and related methylxanthine compounds are recognized as having a diuretic action, and consumers are often advised to avoid beverages containing these compounds in situations where fluid balance may be compromised. The aim of this review is to evaluate the available literature concerning the effect of caffeine ingestion on fluid balance and to formulate targeted and evidence-based advice on caffeinated beverages in the context of optimum hydration. Method

A literature search was performed using the Medline database of articles published in the medical and scientific literature for the period of January 1966-March 2002. Subject headings and key words used in this search were: tea, coffee, caffeine, diuresis, fluid balance and water-electrolyte balance. A secondary search was performed using the bibliographies of publications identified in the initial search. Results

The available literature suggests that acute ingestion of caffeine in large doses (at least 250-300mg, equivalent to the amount found in 2-3 cups of coffee or 5-8 cups of tea) results in a short-term stimulation of urine output in individuals who have been deprived of caffeine for a period of days or weeks. A profound tolerance to the diuretic and other effects of caffeine develops, however, and the actions are much diminished in individuals who regularly consume tea or coffee. Doses of caffeine equivalent to the amount normally found in standard servings of tea, coffee and carbonated soft drinks appear to have no diuretic action. Conclusion

The most ecologically valid of the published studies offers no support for the suggestion that consumption of caffeine-containing beverages as part of a normal lifestyle leads to fluid loss in excess of the volume ingested or is associated with poor hydration status. Therefore, there would appear to be no clear basis for refraining from caffeine containing drinks in situations where fluid balance might be compromised.

Keywords: [body water](#); [caffeine](#); [diuresis](#); [fluid balance](#); [hydration](#)

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