Gender and body size affect the response of erythrocyte folate to folic acid treatment.

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BACKGROUND: The recommended dietary allowance (RDA) differs between men and women for some vitamins, but not for folate. The RDA for folate is derived mainly from metabolic studies in women.

OBJECTIVE: We assessed if men differ from women in their response of erythrocyte folate to folic acid supplementation.

METHODS: We used data from 2 randomized placebo-controlled trials with folic acid: a 3-y trial in which subjects ingested 800 mug/d of folic acid (294 men and 112 women) and a 12-wk trial in which 187 men and 129 women ingested 0, 50, 100, 200, 400, 600, or 800 microg/d of folic acid in a parallel design (n = 38-42 per treatment group).

RESULTS: In the 3-y trial, the erythrocyte folate concentration increased 10% (143 nmol/L, [95%CI 46, 241]) less in men than in women. In the 12-wk trial, regression analysis showed that the response of erythrocyte folate upon folic acid intake for men was 47 nmol/L lower than for women (P for beta(gender) = 0.022); for an intake of 800 microg/d folic acid, this resulted in a 5% lower response in men than in women. Differences in lean body size explained 56% of the difference in response of erythrocyte folate between men and women in the 3-y trial and 70% in the 12-wk trial.

CONCLUSION: Men need more folic acid than women to achieve the same erythrocyte folate concentration, mainly because men have a larger lean body mass. This could be an indication that the RDA for folate should be higher for men than for women, or that the RDA should be expressed per kilogram of lean body mass.

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