

## COMMENTARY

Gesch *et al* make two important contributions in the area of nutrition and antisocial behaviour. Of primary importance, they produced the first independent replication of 3 studies performed by our group in Oklahoma,[1] California,[2] and Arizona [3]. Second, this study permits generalisation of the American findings to a British population (table).

Randomized trials on the effects of vitamin-mineral supplementation on antisocial behaviour in correctional institutions and public schools

Location	Population	Sample size	Ages	Results (Difference)	P-value
England	Young adult inmates	231	18+	35%	< .001
Oklahoma [1]	Juvenile delinquents	62	12 to 17	45%	0.005
California [2]	Adult "inmates"	402	18+	38%	0.025
Arizona [3]	School children	468	6 to 12	47%	0.020

In the US, improvements in behaviour occurred within 3 days and deteriorated within 2 weeks of terminating the supplements.[1][2] Changes were noted in less than 25% of all 3 populations, but were large enough to produce the mean differences. The best 2 clinical signs that predicted dramatic change were filliform papillary edema (the papilla near the tip of the tongue are swollen and inflamed producing a 'strawberry' tongue) and angular cheilosis (cracks in the corner of both lips). The best predictive laboratory markers were low water-soluble vitamin blood nutrient concentrations, followed by low fat-soluble vitamins and low iron status. Correcting low blood nutrient concentrations (using existing reference norms) produced a 92% reduction in violent antisocial behaviour (131 acts to 11) among 16 children with only a 4% reduction among 10 controls.[1][2] At the same time, abnormal EEG patterns tended to normalise among those receiving active treatment with no change in controls.[2] In light of this historical context, Gesch's independent UK replication is important.

Smith suggests the need for a better theoretical understanding about why poor nutrition impacts brain function and behaviour.[4] For example, are the supplements improving blood flow in the brain or are they correcting frank deficiencies? Such theoretical grounding could help focus future research. The most difficult methodological issue would be whether a single or small combination of the 20 or more nutrients is the agent of change, or whether all are required. Studies with individual nutrients and various combinations would be required to unravel such questions. There is also a need to expand replication to other groups, most notably in familial settings involving child abuse and domestic violence. This could be accomplished in single-subject designs under court intervention or in clinical trials.

There are also clinical applications for mental health professionals working with violent patients. Dietary history taking followed by a comparison of daily intakes of each nutrient and recommended daily allowances should be followed by an examination of clinical signs of malnutrition in the oral cavity, lips, eyes and skin. An 'at-risk' diagnosis should result in blood vitamin assays concurrent with presumptive supplementation. If low blood nutrient status is confirmed, the client may be educated as to the types of foods that are rich in that nutrient with the suggestion that the supplement be continued as a type of insurance policy. Ironically, this has been the recommended nutritional assessment and counselling technique for physicians and nutritionists for over 20 years. It appears to lower violence as well as improve both physical and mental health.

Public policy implications are a more difficult issue. It is uncertain whether public institutions should routinely provide prisoners, probationers, parolees and schoolchildren low-dose chewable vitamin-mineral tablets at close to the recommended daily allowances. Supporters might argue that such policies would alter antisocial behaviour and therefore save many lives, while detractors might counter that such action is premature based on only 4 studies. Now is the time for reasoned policy discussions.

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## References

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