

Controlling the health disorders of iodine: translating geochemistry into health.

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Background. Iodine, in both deficiency and excess, leads to health problems that affects individuals and communities. Deficiency stunts the development of the fetus and infant, in particular brain and stature [cretinism], with lifelong results. Miscarriages and peri-natal mortality are commoner in deficient communities, which also suffer from a widespread reduction in IQ. An excessive iodine supply in the community contributes to thyrotoxicosis, with potentially fatal effects on the heart, but also on the emotions, metabolism and the digestive system.

Methods. Fieldwork, undertaken with a UK Department for International Development grant, in China and Morocco set out to define the iodine supply [by urinary iodine] and the prevalence of the iodine deficiency disorders [by serum thyroid hormones and thyroid ultrasound] in communities living in regions known historically to suffer from goitre. This was then linked with concurrent environmental iodine estimations [soil, water, vegetable] and an assessment of community iodination programmes.

Results. We found that iodination of the diet can cut the deficiency disorders dramatically, but the evidence suggests that blanket iodination, covering communities with differing levels of environmental iodine, can be inappropriate and may lead to toxicity.

Conclusions. There are global implications of this. The control of iodine deficiency, in particular, needs rethinking. The present practice is disease orientated with little account taken of the local people or environment.

Integrating the geochemical understanding of the iodine cycle with knowledge about the people and the distributions of the iodine related disorders in their community would lead to more appropriate iodination and the resulting reduction of both deficiency and toxicity.

Planning for health at local, national and international levels must take account of the current geochemical understanding of iodine.

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