

Chernobyl and the KI controversy in the United States

Jacob Robbins and Arthur B Schneider

Until the Chernobyl accident, the risk of radioactive iodine exposure from a nuclear plant accident was not established, and the safety of prophylactic, high-dose KI administered to a large population was uncertain. Now, the occurrence of thousands of thyroid cancers in young people in Belarus and Ukraine has erased any doubt that a nuclear plant accident can cause thyroid cancer,¹ and the safety of KI in children and young adults has been clearly proven by follow-up of the millions given KI in Poland.²

Plans for providing KI in the vicinity of power plants are not uniform throughout the world. In the US, disappointingly, the nuclear industry and the Nuclear Regulatory Commission only reluctantly included KI in their plans. They argued that KI only protects a single organ and so is less important than evacuation and sheltering, that a Chernobyl-like accident is unlikely in better-designed reactors, that KI gives a false sense of security, and that preventing ingestion of contaminated food and milk is sufficient. These arguments reflect important concerns, but do not negate the fact that in a crisis KI would be in high demand, would be an effective addition to food management, and would supplement incomplete sheltering and inadequate evacuation.

The Chernobyl accident shows that once radioiodines are released, their distribution is highly dependent on atmospheric conditions. Initially the wind carried the plume northwest toward Poland and studies 3 days after the accident in a region more than 250 miles (400 km) distant showed that KI administration (usually a single dose) plus restriction of milk and vegetable ingestion reduced thyroid radioiodine uptake by 70%; 40% of this reduction was attributable to KI. Radioiodine was found in the air at the time KI was given, but the distance of the Polish border from Chernobyl might

A 20-mile (32-km) KI distribution program has not yet been instituted...

J Robbins is Scientist Emeritus in the Clinical Endocrinology Branch, National Institute of Diabetes and Digestive and Kidney Diseases, NIH, Bethesda, MD, USA. AB Schneider is a Professor Emeritus of Medicine in the Section of Endocrinology and Metabolism, University of Illinois College of Medicine, Chicago, IL, USA.

Competing interests

The authors declared no competing interests.

www.nature.com/clinicalpractice
doi:10.1038/ncpendmet0779

prompt questions about whether the exposure was enough for significant risk to the thyroid. Although no increased thyroid cancer in exposed Polish children who did not receive KI has been demonstrated, a greatly increased occurrence of thyroid cancer was found in Belarus and the Bryansk Oblast in Russia (as far as 100 miles [160 km] west of Chernobyl).^{3,4} Given its safety and low cost, KI is indicated even when the cancer risk is low. For children and pregnant or lactating women, the WHO advises that KI be given when the expected radiation dose is as low as 1 cGy (1 rad) and the US FDA recommends this at 5 cGy.

Because KI must be taken just before or very soon after exposure, its availability at short notice is essential. This requires predistribution within short distances of nuclear reactors (currently an arbitrary 10 miles (16 km) in the US and 10 km in France⁵) and numerous strategically placed stockpiles at greater distances. In 2002 the US Congress passed legislation meant to increase the availability of KI to cover a 20-mile (32 km) radius around nuclear reactors; in 2004 the US National Academy of Sciences endorsed the distribution of KI. A 20-mile (32-km) KI distribution program has not yet been instituted, however, and in 2007 responsibility for it was reassigned to the President's scientific advisory office. The delay of over 5 years may reflect concern that an expanded KI distribution program would increase public resistance to increasing nuclear power generation capacity. The logistics of satisfactory KI availability programs in the US need urgent attention.

Supplementary information, in the form of a list of references cited in this article, is available on the *Nature Clinical Practice Endocrinology & Metabolism* website.