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Toxicology of repeated iodine thyroid blocking on adult's thyroid function and on the progeny's brain development

Lebsir Dalila¹, Guemri Julien¹, Manens Line¹, Grison Stephane¹, Kereselidze Dimitri¹, Phan Guillaume¹, Tack Karine¹, Benderitter Marc¹, Pech Annick², Lestaevel Philippe¹ and Souidi Maamar¹

¹Institute for Radiological Protection and Nuclear Safety, France ²Central Pharmacy of Armed Forces, France

Statement of the Problem: Thyroid cancer (TC) is the major health consequence of nuclear accident. To prevent TC incidence, a single dose of potassium iodide (KI) is recommended to block thyroid radioiodine uptake. In situation of prolonged exposure like Fukushima disaster, many doses of KI may be necessary. Whereas single dose of KI transiently blocks thyroid function the Wolff-Chaikoff effect, studies about the effects of repeated KI administration are scarce. Thyroid hormones (THs) play an obligatory role in many fundamental processes underlying brain development and maturation, the repeated KI administration could modify (THs) level which may impact body functioning.



Purpose: To evaluate the impact of repeated administration of KI 1 mg/kg in adult rat especially thyroid function and then in more sensitive model the fetus with a particular focus on their central nervous system (CNS) development.

Methodology & Theoretical Orientation: Adult male rats were subjected to either KI or saline solution over 8 days. Clinical biochemistry, pituitary and thyroid hormones level, anti-thyroid antibodies level and thyroid genes expression were analyzed 30 days after stopping the treatment. The male progeny were subjected to KI indirectly through the treatment of their mothers since (GD9) over 8 days and 30 days after the weaning, we evaluated the same parameters as for the adults, we also assessed behavior and CNS genes expression.

Findings: We didn't report any significant effect of repeated KI intake in adult. On the other hand we obtained a significant decrease of TSH and FT4 in treated progeny, also the treatment significantly altered CNS genes expression and motor behavior of progeny.

Conclusion & Significance: The data of adult may contribute to the ongoing developments of KI guidelines and marketing authorization. Contrariwise toxic effect of repeated KI intake on immature brain requires more research.

References

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Biography

Lebsir Dalila is currently pursuing her PhD at the Institute of Radioprotection and Nuclear Safety and completed her Master's degree in Experimental Pharmacology at the University of Jijel, Algeria.

dalila.lebsir@irsn.fr