Abstract


Vitamin E ameliorates iodine-induced cytotoxicity in thyroid.


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BACKGROUND: Acute and excessive iodine supplementation leads to iodine-induced thyroid cytotoxicity. Excessive oxidative stress has been suggested to be one of the underlying mechanisms in the development of thyroid cytotoxicity.

AIM: The aim of this study was to investigate whether vitamin E (VE), an important antioxidant, could ameliorate iodine-induced thyroid cytotoxicity.

METHODS: A goiter was induced in rats by feeding a low-iodine (LI) diet for 12 weeks. Involution of hyperplasia was obtained by administering a twofold physiological dose of iodine in feeding water with/without the supplementation of 25-, 50-, or 100-fold physiological dose of VE in the LI diet for 4 weeks.

RESULTS: In iodine-supplemented rats, thyroid epithelial cell ultrastructure injuries remained and were more severe. Relative weights of iodine-induced involuting glands were significantly reduced compared with the goiter, but still higher than control. Immunohistochemistry indicated that the expression of 4-hydroxynonenal, 8-hydroxyguanine, peroxiredoxin 5, and CD68 in thyroid increased (P<0.01), whereas thioredoxin reductase 1 decreased (P<0.01). VE supplementation attenuated thyroid cytotoxicity induced by iodine. A 50-fold VE dose was optimal in attenuating twofold iodine-induced thyroid cytotoxicity. However, VE supplementation did not reduce the weight or relative weight of the iodine-induced involuting gland.

CONCLUSIONS: These results show that excess iodine leads to thyroid damage and VE supplementation can partly ameliorate iodine-induced thyroid cytotoxicity.

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