Iodine supplementation activates folliculogenesis in rabbit ovary

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Abstract

The aim of this study was to assess the biological effect of the product Jodis Concentrate (JC) on the rabbit ovaries by evaluating the folliculogenesis and expression of oocyte-specific growth differentiation factor 9 (GDF9).

The experiment was conducted with 30 female two month old New Zealand rabbits that were the F1 offspring born to mothers differently treated with Jodis concentrate. The control group (n=10), consisted of F1 offspring born to mothers without iodine treatment, and was not supplemented with JC. The first experimental group (n=10), consisted of F1 offspring born to mothers treated with JC during pregnancy and the suckling period, and was supplemented with JC daily at a dose of 2 ml/L drinking. The second experimental group (n=10), consisted of F1 offspring born to mothers without iodine treatment, and was also supplemented daily with the same dose of JC - 2 ml/L drinking. All groups were fed with total mixed ration for growing rabbits. The trial lasted 48 days. The ovaries were weighed and prepared for histological examination. The GDF9 protein expression in the ovary was determined by immunohistochemical analysis. The addition of JC to the drinking water of female rabbits led to more active development of the ovarian follicles from primordial to tertiary stage in both experimental groups. More intensive GDF9 protein expression in the oocytes and cumulus cells of rabbits, supplemented with JC was observed.

Key words: ovary, growing rabbits, growth-differentiation factor 9, iodine supplement

Introduction

Iodine is recognized as an essential constituent of the thyroid hormones in mammals. Normally it is provided in the diet as iodized salt. Minerals in drinking water are more readily absorbed than food, because water does not usually contain chelating agents, which might prevent absorption of the elements (Porter et al. 1988). Triiodothyronine (T3) and thyroxine (T4) have a pronounced physiological effect in the control of respiration and energy metabolism as well as in the biogenesis of the mitochondria. Their production is important in conditions such as disease, starvation or hibernation that lead to altered metabolic status (Hussein and Azab