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MEDICAL SCIENCES AND PUBLIC HEALTH

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STUDY OF THE THERAPEUTIC EFFECTS OF PLACENTA AND SPLEEN CRYOEXTRACTS IN AN AUTOIMMUNE THYROIDITIS MODEL: CHANGES IN HORMONAL BALANCE

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Background. Autoimmune thyroiditis (AIT) is a chronic inflammatory disorder of the thyroid gland driven by an autoimmune response, leading to impaired thyroid function. This condition typically results in lowered levels of key thyroid hormones, including triiodothyronine (T3) and thyroxine (T4), contributing to a range of symptoms such as fatigue, depression, metabolic imbalances, and disruptions in body temperature regulation. Given the complex nature of thyroid dysfunction, which involves multiple pathophysiological mechanisms, there is an ongoing need to explore novel therapeutic strategies aimed at restoring normal hormonal balance [1, 2]. One such promising approach is the use of cryoextracts, particularly those derived from the placenta (CEP) and spleen (CES), which are believed to have regenerative effects and may offer potential in correcting thyroid dysfunction in autoimmune conditions like AIT.

Objective. The aim of this study was to investigate the effects of CEP and CES on the levels of thyroid hormones in a rat model of AIT.

Methods. Autoimmune thyroiditis was induced in rats using a thyroid antigen mixture composed of Freund's complete adjuvant and an antigen solution derived from the homogenized tissue of allogeneic thyroid glands in a 1:1 ratio [3, 4]. This

model effectively mimics the key pathological features of autoimmune thyroiditis, making it a reliable tool for studying thyroid dysfunction. A total of 42 male rats, each weighing between 200-220 grams, were randomly assigned to six experimental groups. Blood samples were collected on the 28th day of the experiment to assess the impact of cryoextracts on thyroid hormone levels. Hormonal analysis was performed using enzyme-linked immunosorbent assay (ELISA) kits, which provided accurate and sensitive measurements of triiodothyronine (T3) and thyroxine (T4) levels.

Results. The study found that in the group treated with CEP, the free T3 level decreased by 48.5% ($p < 0.001$), with a value of 4.0 ± 0.19 (95% CI: 3.6–4.4) pmol/L. In the CES-treated group, the free T3 level was 5.0 ± 0.15 (95% CI: 4.8–5.3) pmol/L, showing a 34.9% decrease ($p < 0.001$) compared to the control group (AIT without treatment). Furthermore, the CEP group exhibited a 57.2% increase ($p = 0.03$) in the ratio of total T3 to free T3, relative to the control group. CES also led to a 32.2% increase ($p = 0.007$) in this ratio, though the effect was less pronounced compared to CEP and L-thyroxine treatment.

Regarding T4 levels, the CEP-treated rats had a T4 level of 78.4 ± 2.0 (95% CI: 74.5–82.3) nmol/L, indicating a moderate correction in T4 levels, though some thyroid dysfunction remained. The free T4 level in the CEP group was 16.7 ± 1.3 (95% CI: 14.2–19.3) pmol/L, which indicated partial normalization, though deviations from normal levels persisted. In the CES group, the free T4 level was 19.9 ± 0.5 (95% CI: 18.9–20.9) pmol/L, showing a less significant reduction in this parameter compared to the group treated with L-thyroxine.

Conclusions. The results of this study suggest that both cryoextracts – CEP and CES have an impact on thyroid hormone levels in rats with autoimmune thyroiditis. CEP administration resulted in a significant reduction in free T3 levels and improved the ratio of total T3 to free T3, indicating its potential to help restore thyroid function in the context of autoimmune inflammation. CES also improved T3 levels, but to a lesser extent than CEP. As for T4 levels, both cryoextracts showed moderate effects, with CEP contributing to partial normalization of free T4 levels, though complete normalization was not achieved. These findings suggest that cryoextracts of placenta and spleen may be promising therapeutic agents for autoimmune thyroiditis, but further studies are needed to better understand their mechanisms of action and determine optimal dosages for clinical use.

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SECTION 22.

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