Effect of Persistent Hyperestrogenemic state in hyperthyroid males on hypothalmo-pitutiary function

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Background

Hyperthyroidism is associated with decreased libido, impotence and gynaecomastia due to raised levels of oestradiol suggesting a hyperestrogenemic environment. In adult rodents sexual dimorphism of hypothalamo-pituitary axis is complete and cannot be influenced by any epigenetic influence. Therefore, under no environmental and epigenetic influence can the sexual dimorphism of the pituitary gland be abolished in these animals. To find out whether such sexual dimorphism of hypothalamo-pituitary axis exists in humans too, we studied the relationship of the peripheral gonadal steroid with the circulating gonadotropins, markers of hypothalamo-pituitary axis function in hyperestrogenic, hyperthyroid males. We chose a disease model, as experimental hyperestrogenism cannot otherwise be induced in healthy human male subjects.

General Objectives

We decided to investigate hyperthyroid male subjects, since hyperthyroidism represents a natural hyperestrogenic state in human males, which provides an opportunity to study its effect on pituitary and establish gender-related differences in hypothalamo-pituitary activity. We hypothesised that hyperthyroidism abolishes the endocrine dimorphism in male, and possibly unmasks a positive feedback effect of oestradiol, similar to the one observed during mid-cycle in females.

Specific Objectives

hyperthyroid group (268.56 ± 24.60 mg/dl versus 132.22 ± 48.42 mg/dl , and 198.56 ± 23.71 mg/dl versus 77.40 ± 35.91 mg/dl respectively). Mean levels of T and E2 were approximately two times higher in hyperthyroid subjects (group II) in comparison with euthyroid subjects (group I). DHEAS levels were similar in both groups ruling out any adrenal involvement. Mean serum LH level was 2.6 folds higher in group II in comparison with group I. Mean serum levels of FSH were higher in group II, it was marginally nonsigniûcant.

Conclusion

On the basis of the elevated E2 and T levels and other observations, we hypothesise that endocrinological dimorphism in human male and female is not rigid; a sustained rise in serum oestradiol probably induces a positive feedback action on pituitary leading to elevated gonadotrophin levels, unlike lower animals.