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# Current Views on Oestriol

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*Edited by*

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## 27. Interaction of TSH and "TSI" with thyroid membranes

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*Questions:* Differences in the effect of TSH and thyroid stimulating immunoglobulins on the thyroid gland have been demonstrated using the McKenzie bioassay and the stimulation of cAMP in thyroid tissue. The subject of this investigation was to evaluate whether similar properties can be shown in the radioreceptorassay (RRA) on thyroid membranes.

*Methods:* Human thyroids were prepared as described by *Schleusener et al.* [1] in buffer A (50 mM NaCl, 10 mM phosphate pH 6.5). Bovine TSH was labelled with lactoperoxidase and membrane purified according to the method of *Smith et al.* [2]. Immunoglobulin preparation: Serum was precipitated twice with buffer A containing 25 % PEG. The pellet was suspended in buffer A and chromatographed on DEAE-cellulose columns. The eluate was concentrated by ultrafiltration. Using simultaneous chromatography more than 50 samples could be prepared per day. The recovery of IgG was approximately 60%. Contamination with IgA was less than 10%. RRA was performed as reported previously by others [1]. If not otherwise stated preincubation of the thyroid membranes with TSH or IgG was for 60 min. 0.8 mg IgG were added per assay tube. Results were expressed in terms of percentage of control binding. The mean values obtained from normals and patients with hyperfunctioning autonomous adenomas (control group)  $\pm$  twofold standard deviation was considered to be the normal range.

*Results:* In untreated Graves' disease we found TSH displacing activity (TDA; N=28;  $88.2 \pm 13.5\%$ , mean  $\pm$  SD) which was statistically different ( $p < 0.0005$ ) from the control group (N=13;  $105.8 \pm 6.3\%$ , mean  $\pm$  SD). In 61% (N=17) TDA was judged to be positive. The dilution of IgG with high titres of TDA resulted in curves neither parallel to bovine TSH nor to human TSH. Preincubation of thyroid membranes with IgG over 60 min followed by incubation with TSH-tracer (60 min) gave enhanced displacing activity in comparison to

determination of the same IgG without preincubation. Preincubation over 180 min effected a further increase. This effect was obvious in about 50% of IgG from patients with Graves' disease but neither in the control group (Fig. 1) nor with bovine TSH.

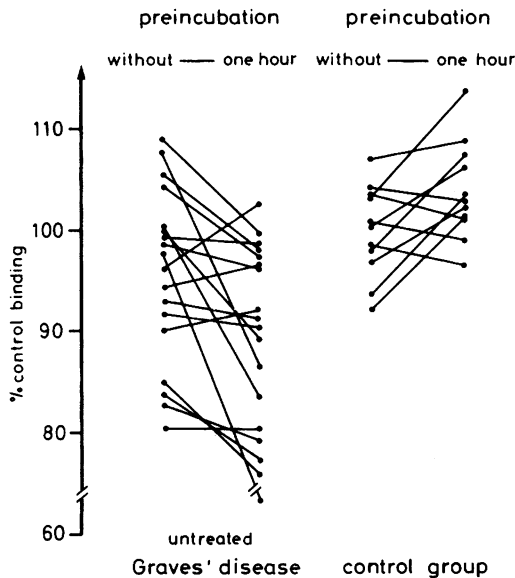


Fig. 1. Influence of preincubation on TDA values

Kinetic studies using RRA showed that the binding of bTSH reached equilibrium after about 30 min, but in contrast some Graves' disease IgGs had delayed kinetics.

*Conclusions:* 1. Preincubation of thyroid plasma membranes with immunoglobulins is useful to obtain a sensitive radioreceptorassay for TDA. 2. The different slopes of TSH and TDA dilution curves cause problems in quantification of TDA. 3. The differences in kinetic properties indicate a different kind of interaction of TSH and IgG with the thyroid gland as already demonstrated by the LATS-bioassay and the stimulation of cyclic AMP in thyroid tissue.

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