

each other to derive the error of fluctuation of the former.

In a separate procedure, each of the known values was corrected by the indicated value and the standard serum value; and the correlation between this corrected value and the TBI was obtained.

Result:

The standard deviation of variability of the Triosorb value and the TBI value were  $\pm 0.35$  and  $\pm 0.03$  alike, our experiment demonstrated.

Also, the purity of the Triosorb solution per se proved to remain unchanged even at the end of the 3rd week of assay.

The variation in the indicated value of the sponge-uptake is so remarkable as to give a standard deviation of  $\pm 2.48$ , according to our sponge uptake correction method.

The coefficient of correlation of the TBI value and the Triosorb value, according to the standard serum correction method, was  $-0.8$ .  
Summary:

In our experiment, it is demonstrated that the purity of the Triosorb kit and the variability of the kits per se offer no essential problem except that a considerable degree of variability is seen in the sponge-uptake value indicated.

Accordingly, different correction procedures are nowadays employed in major clinical laboratories of hospitals or biochemical institutes.

It is desirable, therefore, that the producer of these kits should place emphasis on eliminating the variability of the Triosorb kits.

### **Comparative Study between TBI Method (Mallinckrort Company) and T<sub>3</sub> Method (Triosorb Test) in the Field of Obstetrics and Gynecology**

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1. Clinical Application of <sup>131</sup>I-Triiodothyronine Resin Sponge Uptake Test (Triosorb test) in the field of Obstetrics Gynecology was already reported by us 1966 (*Acta Radiologica Japonica* 25, 5, 346-358). In this Literature, the mean value of T<sub>3</sub> test of the serum with the 94 normal pregnant women shows

significantly low.

2. Comparative Study between TBI method and F3 method was performed with the same serum of the 89 pregnant women. The value of TBI method are not only stable but significantly no difference to the serum of normal non-pregnant women.

### **Studies on the Methods of Separation of Protein-Bound ACTH and Free ACTH in Radioimmunoassay**

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Mathematical analysis of the dynamic equilibrium between a hormone and its binding protein suggests that the standard curve

of radioimmunoassay of the hormone is a hyperbola. From this point of view, only hydrodynamic paper electrophoresis (PEP)

gave hyperbola type standard curve and other methods including dextran coated charcoal adsorption (CA), Fuller's earth adsorption and Veronal buffer paper chromatography gave sigmoid curves.

To elucidate the discrepancies between the results determined PEP and CA, the following experiments were performed; 1) reproducibility of B/F ratio determined by CA, 2) influence of the concentration of antisera and charcoal solution on B/F ratio and 3) optimal concentration of charcoal solution.

Reproducibility of B/F ratio determined by CA was not thought to be a major cause of the discrepancies.

Determination of % free values by combining various amounts of binding protein and ACTH revealed the fact that excess of charcoal adsorbed not only free ACTH but also

some part of immunoglobulin-bound ACTH and, to the contrary, with small amount of charcoal, some part of free ACTH remained unadsorbed.

When standard curves were depicted using aliquots containing 0, 5, 10 and 25  $\mu$ U of ACTH by PEP and CA, the B/F ratio of CA-standard curve at 0  $\mu$ U was lower than that of PEP-standard curve and the B/F ratios of CA-standard curve at 5, 10 and 25  $\mu$ U were higher than those of PEP-standard curve. The amount of charcoal adopted in this experiment was too much for 0  $\mu$ U aliquot, eventually adsorbing some part of protein-bound ACTH, and on the other hand, it was too small for 5, 10 and 25  $\mu$ U aliquot allowing some part of free ACTH unadsorbed. This is the major cause of the fact that the standard curve of CA is sigmoid.

## Study of $^{131}\text{I}$ Diethylstilbestrol Disodium Diphosphate

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Diethyl stilbestrol disodium diphosphate (Honvan), which has been in wide use for cancer of prostate is said to change to active form (stilbestrol) by acid phosphatase in the prostate.

Tubis et al. suggested the probability of scintiscanning of the prostate gland by  $^{131}\text{I}$  Honvan. Yet there has been no literature on this subject.

This paper deals with the results of animal experiment and clinical studies with this drug. 55  $\mu\text{Ci}$  of  $^{131}\text{I}$  Honvan for each rat was administered by tail vein. Specific activity of  $^{131}\text{I}$  Honvan was 67  $\mu\text{Ci}$  per mg. Each group of this experiment consisted of 3 male rats weighing 110~150 gm. Radioactivities each organ (prostate, liver, kidney, spleen, heart,

lung, intestine, adrenal and testicle) were determined in different time intervals (5, 15, 30, 60 min., 3, 6, 12, 24 hr., 2, 3, 5, 7 day) and the Relative Specific Activity (R.S.A.) of each organ was computed. The highest concentration was observed in the liver followed by the kidney, and a relatively long retention was recognized in the liver. The R.S.A. in the prostate was demonstrated to be lower than expected.

In clinical studies of 6 patients (3 cancers of the prostate, 1 prostatitis, 1 chronic cystitis and 1 tumor of the bladder) 500  $\mu\text{Ci}$  of  $^{131}\text{I}$  Honvan was administered for these cases intravenously. The uptake by each organ was the same as described in the rats, and the uptake by metastatic lesion of prostatic can-