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 To: John J. Mc Phaul, Col, USAF MC
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 Subject : Final Report Research Protocol

Measurement of Thyroid Hormone and Thyroid Stimulation Hormone in Pregnancy and Early Life.

This project was 95 % completed and its completion awaits the delivery of five pregnant patients. The steps in the project were as follows:

a. Collection of blood specimens from three groups of patients :

1. normals: Individual specimens were collected from 80 women in various stages of gestation.
2. normals: 8 women were followed serially through their pregnancy and delivery with monthly examinations and blood specimen samplings.
3. patients on thyroid hormone: 12 patients already taking thyroid hormone for varying reasons were placed on 0.3 mgm/day Synthroid and examined monthly and at delivery.

b. A radioimmunoassay for measuring purified bovine- TSH was developed which was more sensitive than any assay previously reported by a factor of 10. This assay/ not show cross reactivity with HCG, HGH, LH, FSH or placental lactogen did

and a 10 % incomplete reaction with human TSH which was completely blocked with 5 units h- TSH. Normal patients in various stages of pregnancy showed undetectable levels of TSH by this assay. An attempt was made to purify Human Chorionic Thyrotrophin from normal placentas but the final product was not concentrated enough to allow demonstration of cross reactivity in the h- TSH assay, although it was measureable in the assay. *qualitative*

c. The levels of human thyrotrophin were measured in all patients.

Results: As expected patients on synthroid showed undetectable blood levels of h- TSH distinctly different from normal pregnant women on no medication. (the normal h-TSH levels are 3.5 uU/ml., S.D. 1.5 uU). However, the infants of mothers who are taking Synthroid have detectable h-TSH levels at birth and these are identical to those infants from mothers on no medication demonstrating that Synthroid was unable to effectively pass the placental barrier. One patient studied was hyperthyroid during her pregnancy and was treated with propylthiouracil to control the hyperthyroidism and synthroid to supply her infant with thyroid hormone. Propylthiouracil readily crossed the placental membrane but synthroid does not. As a consequence the infant's thyroid was blocked with PTU and he was not supplied with thyroid hormone. He/hypothyroid at birth with a h-TSH levels of 66 uU/ml. (6-12 X normal) ~~was~~ *was* cretinoid with a goiter. This patient clearly demonstrates the hazzard of combination drug treatment in a pregnant hyperthyroid patients.

Further studies could be done to show the effects of triiodothyronine.

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