CHRONIC LYMPHOCYTIC THYROIDITIS (CLT) IN THYROXINE (T4) TREATED CHILDREN. Rebecca T. Kirkland, Alfred Tenore, Vanitha Vaidya, John S. Parks, Robert D. Utiger and Alfred M. Bongiovanni. Univ.of Pa. Dept. of Pediat. The Children's Hospital of Philadelphia.

Progression of CLT in T4 treated children has been poorly documented. The response of endogenous T4, T3 and TSH to withdrawal after 2 to 9 yrs of therapy in 6 children, 7-18 yrs, was studied with weekly levels for 4-20 wks. At Dx. of CLT 5 had hypothyroid values. Results indicated 3 patterns of response: 1) clinical and lab evidence of hypothyroidism in 6 wks, 2) increased TSH with normal T4 followed by return of goiter 8 wks off therapy, 3) clinical & chemical euthyroidism in 3 with no return of goiter 12-20 wks off therapy. This group demonstrated a reduction in agglutinating antibody (Ab) titers from initial levels. Two had hypothyroid lab data at dx. of CLT. Normal TSH, T4 & T3 occurred 3 wks after discontinuing therapy. A reduction in Ab titers with normal TSH accompanied euthyroidism. Hypothyroidism coincided with unchanged Ab. In contrast to adults treated for 10 yrs, with deterioration in thyroid function noted 6 wks off therapy (Papapetrou et al, Lancet,Nov.72), these studies indicated that the child may recover function after a period of replacement.

EFFECTS OF SERUM FROM GROWTH HORMONE DEFICIENT PATIENTS ON THE IN VITRO GROWTH OF HUMAN SKIN FIBROBLASTS. Margaret H. MacGillivray, Claudia Hastings, Judith A. Brown and E.J. Brandt. SUNYAB, Children's Hosp., Dept. of Ped., Buffalo, N.Y.

In this communication, data are presented on the morphological changes which occurred when human skin fibroblasts were grown in medium containing serum from hypopituitary patients prior to and during treatment with human GH. Skin fibroblasts obtained from normal and GH deficient children were established in monolayer culture using F10 with 10% fetal calf serum (v/v). When these cells were subcultured for 2 passages in F10 with 10% untreated hypopituitary serum, the fibroblasts, during the second passage, exhibited strikingly abnormal cellular morphologies and disruption of monolayer growth. The cells became rounded, detached from the growing surface and floated free in the medium. The floating fibroblasts, whether derived from the control subject or GH deficient patients, re-established normal monolayer confluency when replated into medium containing normal serum or serum from hypopituitary patients during GH treatment. Morphological changes were recorded using a Unitron Inverted Photomicroscope.

This human fibroblast system provides an additional in vitro method for studying the growth promoting properties of sera from children with various forms of growth failure.

A LONGITUDINAL STUDY OF PUBERTY IN BOYS. Peter A. Lee, A. Rees Midgley, Jr., Robert B. Jaffe, Claude J. Migeon. Clin. Invest. Ctr., Naval Regional Medical Center, Oakland, Ca.; Dept. Path. & Dept. of Ob-Gyn., Univ. of Mich., Ann Arbor; Dept. of Ped., Johns Hopkins Univ. and Hosp., Baltimore, Md.

A prospective study, designed to correlate serial measurements of tropic and end organ hormone levels with the physical changes of puberty, was carried out in 46 boys with physical examinations and blood samples every 6 months for 4 years. Serum levels of LH, FSH, prolactin, testosterone (T), androstenedione, dehydroepiandrosterone (DHA), DHA sulfate, progesterone (P), 17 OH-P, estrone, and estradiol were determined and correlated with genital and pubic hair staging criteria, appearance of axillary hair, facial hair, voice change, acne, pubertal gynecomastia, weight gain, and height increase.

Significant correlations were: (1) parallel increases of LH and T throughout puberty after an initial rise of LH; (2) FSH increases during early puberty; and (3) androstenedione, DHA, and DHAS increase throughout. Prolactin levels did not change. Concentrations of 17-OH-P increased while P levels rose minimally. The 80% who developed acne had significantly higher T levels than stage-matched controls. Subareolar breast hyperplasia occurred in 68% concomitant with a rise of T occurring with minimal increases of estrogen. The onset of facial hair, axillary hair, voice change, and increased weight and height are more closely correlated with increasing T levels than changes in other hormone levels. (Supported in part by NIH-HD-05318)

GLUCOCORTICOID INHIBITION OF GAGS BIOSYNTHESIS: POSSIBLE SITE OF ACTION, M.Loretta McNatt, Barbara S. Wingfield, Edwin R. Hughes, and M. Joycelyn Elders, Univ. or Ark. Med. Ctr., Little Rock, Arkansas

Glucocorticoid hormones inhibit the biosynthesis of glycosaminoglycans (GAGS) which are essential for normal skeletal growth. Previous studies have shown that these hormones alter both somatomedin, which stimulates GAGS biosynthesis, and the cartilage cell directly. We have further studied the effect of cortisol on GAGS biosynthesis in embryonic chick cartilage. When cortisol was administered to 9 day old embryos 24 hours prior to injecting radioactive precursors, $^{35}SO_4$ uptake into GAGS was decreased 70%, ^{14}C-proline into OH-proline 14%, ^{14}C-serine into protein 15% and ^{3}H-thymidine into DNA 17%, suggesting cortisol specifically inhibited GAGS biosynthesis without comparable inhibition of DNA or protein biosynthesis. Assays of the glycosyltransferases responsible for the formation of the protein-polysaccharide linkage region in cartilage from cortisol treated embryos showed xylosyltransferase activity decreased by 50% in both long and short term incubations, while the activities of other glycosyltransferases were unchanged. Addition of exogenous xylose acceptor stimulated the activity several fold. In vitro addition of cortisol to the enzyme assays was without effect.

These data suggest the site of action of cortisol is to decrease the endogenous acceptor protein in growing cartilage or the activity of the enzyme, xylosyl transferase.

BLOOD PRESSURE AND PUBERTY. Sol Londe, Ann J. Johanson, Norton S. Kronemer and David Goldring. Washington University Medical School, Department of Pediatrics, St. Louis Children's Hospital, St. Louis, Missouri and University of Virginia School of Medicine, Department of Pediatrics, Charlottesville, Virginia.

The possible relation of the blood pressure (B.P.) to sexual maturation and the incidence of hypertension were determined in a healthy group of 418 boys and girls, 10 to 14 years of age. B.P. in each age group and in each sex was correlated with weight, height, pubic hair growth in boys, breast development in girls, onset and duration of menarche, serum follicular stimulating hormone (FSH), and serum luteinizing hormone (LH). With the exception of significant correlation of systolic pressure with weight in each age group of boys, systolic and diastolic pressures were not significantly related to any of the above variables in either sex. Therefore, the rise in B.P. is not related to sexual maturation. However, there were significant correlations of the stage of pubic hair growth in the boys and of breast development in the girls with the serum levels of FSH and LH. Five (9.6%) of 55 black children and 10 (2.8%) of 363 white children had B.P. above the 90th percentile. This significant difference possibly suggests that the higher incidence of hypertension in the black adult population may begin in childhood.

IMMUNOELECTROPHORETIC STUDIES OF RAT SOMATOMEDIN. Vaddanahally T. Maddaiah, Platon J. Collipp, Viswanathan Balachandar, Jagan N. Pahuja, and Shang Y. Chen. Dept. of Ped., Nassau County Med. Ctr. and SUNY Stony Brook Health Sciences Ctr., East Meadow, New York.

Serum was collected from hypophysectomized rat (HyR) 30 min. after an I.V. injection of hGH. The serum was used to prepare an antiserum (AS) in a rabbit. AS was adsorbed with lyophilized HyR serum (5 mg/ml) and centrifuged to obtain adsorbed antiserum (AAS). Immunoelectrophoresis (pH 9.5) using AS produced a number of lines with normal, HyR serum and Hy + hormone-treated serum but no line with hGH or insulin. AAS did not react with HyR serum but produced a single identical line (at beta globulin) with normal or Hy + GH treated serum. This precipitin line which was also present when whole AS was used may correspond to somatomedin produced in response to hGH. A similar and identical precipitin line was obtained with HyR + bGH treated serum but not with normal human serum. These results suggest that (1) hGH and bGH produce immunologically similar somatomedin(s) in the rat, (2) human somatomedin is immunologically different from rat somatomedin. This laboratory has already shown differences in the kinetics of bGH and hGH uptake by human liver slices.