ADOLESCENT MEDICINE

1 FAMILIES OF ADOLESCENTS WITH INFLAMMATORY BOWEL DISEASE: A DEMOGRAPHIC ANALYSIS. Harvey Aiges, Joseph Portnoy, Mervin Silverberg, Fredric Daum, Dept. Ped. North Shore Univ. Hosp., Manhasset, N.Y., Cornell Univ. Medical Col., NY, NY

Previous epidemiologic data suggest there are demographic characteristics of families which place certain individuals at higher risk for inflammatory bowel disease (IBD). To define these features in an adolescent population, parents of 79 patients with IBD (44 with ulcerative colitis(UC) 35 with Crohn's disease (CD)) answered questionnaires about the family constellation, and socioeconomic and medical status. These patients of whom 66% were male and 5% were non-white, were compared with 64 age and sex matched controls. No positive correlation was apparent with the parents' educational level or socioeconomic status, residential location (urban vs. suburban), or with the age rank of the patient among his or her siblings. Family history of gastrointestinal disease other than IBD was similar in the two groups, as was the incidence of intestinal carcinoma. However 20% of patients with IBD had a relative(s) with either UC or CD, compared to only 3% of controls ($p<.05$). Of the 79 patients with IBD, 62% were Jewish, compared to a Jewish population of only 33% in the control group ($p<.001$). These data suggest that Jewish adolescents, and in particular those with relatives with IBD, are at higher risk for developing either UC or CD. There is no evidence that place of residence, parental education, socioeconomic status, family rank or familial occurrence of other forms of GI disease contribute to an increased risk of IBD.

2 ESTROGEN TREATMENT OF PATIENTS WITH GONADAL DYSGENESIS. R. Alexander, F.A. Conte, S.L. Kaplan & M.M. Grumbach. Dept. Pediat., Univ. California San Francisco, Ca.

Commonly, estrogen therapy in patients with XO gonadal dysgenesis has been deferred until 15 yrs or later; it has been inferred that treatment with estrogen at an earlier age leads to rapid skeletal maturation and a lower adult height. In order to examine this hypothesis, we studied the effect of "low dose" early conjugated estrogen therapy on peak height velocity, bone age, and height. Seventeen patients (Group I), 11 with a 45,X karyotype and 6 with X chromosome mosaicism were given 0.3mg of conjugated estrogens daily starting at a mean age of 13.4 yrs. In comparison, 5 patients (Group II) were treated with 1.25mg of conjugated estrogens at a mean age of 15.5 yrs. In addition, growth was studied in 3 patients (Group III) with karyotypic evidence of a 45,X cell line, short stature and normal gonadal function at puberty.

The mean height velocity in Group I prior to therapy was 2.7cm/yr and post-initial estrogen therapy was 5.2 cm/yr ($p=.0002$); the corresponding velocities for Group II were 2.4 and 4.4 cm/yr, respectively ($p>0.5$). The mean last measured height in Group I was 141.6 cm (135.4-145.8). The final height in Group II was 143.3 cm (136.9-150), and in Group III 135.8 cm (133.5-139). There was no significant difference between these 3 groups ($p>0.1$). These data suggest that low dose early estrogen therapy promotes secondary sexual development and stimulates a growth spurt without inordinate skeletal maturation or a reduction in final height. Thus, we recommend "low dose" estrogen treatment of patients with gonadal dysgenesis early in adolescence as it mitigates the undesirable psychologic effects of a prolonged delay in sexual maturation.

3 GROWTH, SKELETAL MATURATION AND PUBERTY IN SICKLE CELL DISEASE. S. Castells, E.G. Kassner, N. Muthukrishnan, Dept. of Pediatrics, and Radiology, SUNY, Downstate Medical Center, Brooklyn, New York

We have previously shown that severe growth retardation in sickle cell disease is frequently associated with primary gonadal hypofunction and/or hGH deficiency. The present study was undertaken to determine the prevalence of growth retardation, retarded skeletal maturation and delayed puberty in an ambulatory clinic population: single determinations of weight age, height age, skeletal age and pubertal development (when appropriate) were made in 105 boys and girls with homozygous sickle cell disease (age range 5-17 yr). Weight age was retarded >2 SD in 10% and height age was retarded >2 SD in 20% (compared to standards for North American Negro children of similar socioeconomic groups); skeletal age was retarded >2 SD in 30% (compared to standards of Gruelich and Pyle). Skeletal maturation was retarded in 72% of the girls ($p<0.005$) and 50% of the boys ($p<0.01$) with retarded height age; 56% (9/16) of the adolescents had delayed puberty which was associated with retarded bone age in 9/9, retarded height age in 7/9 and retarded weight age in 7/9. Of the 7/16 adolescents with normal pubertal development, 5/7 had normal height age and 6/7 had normal weight age and skeletal maturation.

We conclude that a significant proportion of children with sickle cell disease have retarded growth, skeletal maturation, and pubertal development.

4 EFFECT OF ISOMETRIC AND DYNAMIC EXERCISE STRESS ON HYPERTENSIVE ADOLESCENTS. David E. Fixler, W. Pennock Laird, Victoria Fitzgerald, Susan L. Wilson, Ruth Vance. University of Texas Health Science Center, Department of Pediatrics, Dallas, Texas.

Isometric (ISO) and dynamic (DYN) exercise stress tests were performed on 91 hypertensive and 42 normotensive control subjects 14-17 years old. The hypertensives had resting systolic or diastolic pressures persistently $\geq$ 95th percentile. Blood pressure and Frank VCG were recorded during ISO handgrip (25% of maximum effort for 4 minutes) and bicycle ergometry until the subject was exhausted. At peak DYN exercise, heart rates averaged 191±12 (SD) bpm, and oxygen consumption 34±10 cc/min/kg, indicating near-maximal performance was achieved in most subjects. In the hypertensives, blood pressures (mm Hg) averaged 133±11/77±9 at rest, 148±13/92±12 during ISO stress, and 186±21/68±21 during peak DYN stress. In controls, pressures averaged 110±7/62±12 at rest, 129±11/81±8 during ISO stress, and 166±18/63±14 during peak DYN stress. During DYN stress, 34% of the hypertensives and 5% of the controls had systolic pressures $\geq$200, however, only 1 hypertensive exceeded 220. During ISO stress, 8% of the hypertensives and none of the controls had diastolic pressures $\geq$110; only 1 hypertensive exceeded 120. No adolescent developed cardiovascular symptoms, arrhythmias, or ST segment displacement greater than 1 mm. In view of these findings, we feel hypertensive adolescents should not be restricted in their physical activities unless abnormal cardiovascular changes have been demonstrated during exercise stress testing.

5 SERUM 25-HYDROXYVITAMIN D (25OHD) LEVELS IN CHILDREN AND ADOLESCENTS WITH INFLAMMATORY BOWEL DISEASE (IBD). A.R. Fleischman, F. Daum, G. Dinari, H. Aiges, J.F. Rosen, (Spon. by M.I. Cohen), Albert Einstein Coll.Med., Montefiore Hosp. and Med. Ctr. and Cornell Univ. Med. Coll., North Shore Univ. Hosp., Dept. Ped., New York.

Patients with IBD have abnormalities in bone growth and mineralization. Malabsorption and drug treatment may affect calcium and vitamin D homeostasis. 53 patients with IBD were evaluated for abnormalities in mineral metabolism. Diagnosis, extent of involvement, and activity of disease were determined by clinical, xray, endoscopic, and biopsy data. 17 had ulcerative colitis (UC); 36 had regional enteritis (RE) with disease confined to the colon in only four. All patients had normal serum levels of total calcium, inorganic phosphorus, alkaline phosphatase, and transaminases. Serum 25OHD level in ng/ml (mean ± 1SEM) for all patients with UC was 24.8 ± 1.2 (normal 15-35). The levels of 25OHD in UC patients with more severe disease and/or steroid treatment did not differ from those in remission. In contrast, patients with RE of moderate activity had a mean serum 25OHD level (14.4 ± 2.6) which was significantly different from RE patients in remission (25.0 ± 1.7, $p<0.01$) or with mild disease (23.9 ± 3.0, $p<0.01$). RE patients being treated with steroids had a mean level of 25OHD (18.6 ± 3.1) significantly lower than patients being treated with azulfadine alone (25.3 ± 2.1, $p<0.05$).

These data indicate that IBD of the colon does not affect vitamin D homeostasis; whereas significant small bowel involvement is associated with low serum 25OHD levels.

6 TESTOSTERONE (T) THERAPY FOR BOYS WITH CONSTITUTIONAL DELAY OF PUBERTY (CD). James P. Gutai, Daniel C. Postellon, Alan G. Kenien, and Thomas P. Foley, Jr. University of Pittsburgh School of Medicine, Children's Hospital of Pittsburgh, Dept. of Pediatrics, Pittsburgh, Pa.

Six boys with CD ranging in age from 14 5/12 to 16 2/12 yrs. were evaluated with measurements of 24 hr. integrated concentrations (IC) of LH, T, and androstenedione (Δ), the LH and FSH response to LH-RH, and growth hormone (GH) concentration following arginine-insulin (AITT). Each boy was treated with 3 monthly injections of 200 mg T enanthate and the same studies were repeated 2 months after the last injection of T.

The mean growth rate was 3.75 cm/5 mo. and there was no significant increase in bone age. All boys had a progression in sexual development to Tanner Stage II or III with appropriate increase in testicular volume. Following T therapy, all boys had significant increase ($p < .01$) in the IC of LH, testosterone and Δ, especially the nocturnal IC LH. There was no significant difference in the IC GH. After T therapy, all boys had significantly increased concentrations of LH and FSH following LH-RH ($p < .01$). There was no significant difference in GH concentrations during AITT following T therapy.

In the 8 months following T therapy, 5 of 6 boys have continued their pubertal maturation and increased statural growth with appropriate skeletal maturation. One boy has not had the expected pubertal progression. Further longitudinal studies are needed but small doses of T may be safe and beneficial in the treatment of CD.