913 LOW-DOSE INTRAVENOUS INSULIN THERAPY FOR DIABETIC KETOACIDOSIS IN CHILDREN. Thomas E. Veeser, Michael H. Glines, Leo G. Niederman, and James A. Monteleone. (Intr. by Arthur E. McElfresh) Cardinal Glennon Mem. Hosp. for Children and St. Louis Univ. Sch. of Med., Dept. of Ped., St. Louis, Missouri.

Recent studies in adults have shown the efficiency and safety of continuous low-dose intravenous insulin in the treatment of diabetic ketoacidosis. Little data has been reported in pediatric patients.

Fourteen consecutive children presented in diabetic ketoacidosis. Six were newly diagnosed diabetics. The average admission blood glucose concentration was 806 mg/dl and the mean admission capillary blood pH was 7.13. All patients were given intravenous fluids and continuous low-dose intravenous insulin at a dose of 0.06 units/kg/hr. Fresh insulin solutions were prepared every four hours. Human serum albumin and sodium bicarbonate were not used. There were two critical times in the management of each patient; the first when the blood glucose concentration declined to 300 mg/dl. At this time the I.V. fluids were changed to a glucose containing solution. The average time needed to obtain this blood glucose concentration was 5.7 hr. The second critical time was when the capillary blood pH reached 7.35. At this time intravenous insulin was discontinued. The average duration of intravenous insulin therapy was 9.8 hr. The accumulated dose of intravenous insulin was 0.6 u/kg. The patient was then switched to subcutaneous insulin, .25-.5 u/kgm every 4 hours. No complications were observed. This method was found to be safe and effective.

MORPHOGENESIS

914 ASSOCIATION OF CONGENITAL HEART DISEASE AND ORO-FACIAL ANOMALIES, N. Beligere, W. Bentson, and S. Pruzansky, Univ. of Illinois Center for Craniofacial Anomalies and Dept of Ped. (Introduced by I. M. Rosenthal)

Frequent occurence of electrocardiographic abnormalities in children with cleft lip and palate has been reported. The incidence of congenital heart disease in patients with oro-facial anomalies has been studied. Data Bank Records of 838 consecutive patients referred to Center for Craniofacial Anomalies Clinic were analyzed for the incidence of congenital heart disease. Diagnosis of congenital heart disease was made in 71 (8.5%) patients, a much higher frequency than that found in the general population. The 71 patients included 30 with cleft lip and palate alone, 12 with facial clefts associated with other syndromes 12 craniofacial syndromes without clefts, and 17 with congenital palato-pharyngeal incompetence. Age at diagnosis of the congenital heart disease ranged from birth to 15 years. There were 29 males, 42 females (2 with Turner Syndrome (XO)). Congenital heart disease was confirmed by cardiac catheterization in 53, 6 were diagnosed at autopsy. Cardiovascular surgery was performed in 33. The most common cardiac malformations were: isolated ventricular septal defects in 22 (31%), Tetrology of Fallot in 8 (11%), patent ductus arteriosus in 8 (11%), atrial septal defect in 6 (8%), and coarctation of aorta in 7 (10%), a combination of ventricular septal with an atrial septal defect or patent ductus arteriosus or coarctation of aorta in 7 (10%) and other malformations (13). No transposition of great vessel was found. The data indicates a high frequency of congenital cardio-vascular defects in patients with craniofacial anomalies.

915 RING CHROMOSOME NINE: VARIABLE PHENOTYPIC EXPRESSION. Bocian, Maureen E., Mohandas, Thuluvancheri K., and Kaback, Michael, M. UCLA School of Medicine, Harbor General Hospital, Division of Medical Genetics, Torrance, Calif.

Ring chromosome abnormalities are rare in comparison with other cytogenetic anomalies. They have been described in all groups except group F, mainly in the D group and in the X chromosome. It has been proposed that patients with ring chromosome aberrations involving the same chromosome should have similar phenotypes, and attempts have been made to establish the existence of definite ring syndromes.

We have studied a nine-year-old female patient who presented with coarse facial features, microcephaly, mental retardation, hirsuitism, and tapering fingers. Quinacrine-banded karyotypes derived from peripheral blood lymphocytes revealed a 46,XX,r(9)(p24→q34) pattern. Many of the facial and somatic features of our patients are distinctly different from those of other reported patients with ring-9, of which only five cases have been described. There is also little similarity to cases of 9p-, and we are unable to find reports of cases of 9q-.

These studies support the theory, suggested by others, of variable phenotypic expression of ring chromosomes. In patients with ring chromosomes showing deletions at similar regions, phenotypic variability is the probable result of a combination of factors, including mosaicism (due to the tendency of ring chromosomes to missegregate during mitosis), variable ring structure (simple and polycentric rings, presumably containing duplications and deficiencies), and resulting instability of the ring chromosome.

916 THE COFFIN-SIRIS (CS) SYNDROME. John C. Carey, Bryan D. Hall (Spon. by Charles J.Epstein) Department of Pediatrics, University of California, San Francisco.

In 1970, a distinct pattern of malformation involving severe mental retardation, a characteristic facial appearance, sparse scalp hair with eyebrow and eyelash hypertrichosis, and absent fifth fingernails was described in 3 unrelated girls. Only 2 additional cases have been reported, suggesting that the syndrome is rare. All reported cases have been sporadic events and no mode of inheritance or etiologic factor has been determined. We have evaluated 5 additional individuals with the CS syndrome. Two of our cases were siblings, a boy, whom we examined,and his deceased sister who, by photographs, clearly had the disorder. Neither of the unrelated parents had any manifestation of the syndrome, suggesting that the CS syndrome is inherited in an autosomal recessive fashion. A compilation of all the known cases permits a further delineation of the full spectrum of the syndrome and of the frequency of certain features. Mental retardation, nail hypoplasia and hypotonia occurred in all reported cases. The craniofacial features are very consistent: scalp alopecia (87.5%),microcephaly (80%),eyebrow and eyelash hypertrichosis (70%), and prominent lips (80%). A short philtrum, not previously mentioned as a facial feature, occurred in 50% of the cases. Other clinical features include postnatal growth deficiency (90%), scoliosis (40%) and congenital heart disease (30%). In view of our series of new cases the extreme rarity of the CS syndrome may be overemphasized. It is quite feasible that this syndrome is often confused with the fetal hydantoin and the Cornelia de Lange syndromes.

917 EFFECT OF LUNG BUD EXCISION ON CARDIOPULMONARY DEVELOPMENT IN THE CHICK. Edward B. Clark, D. Richard Martini, Glenn C. Rosenquist, Dept. Ped. U. Nebr. Omaha

Previous experiments have not assessed the role of pulmonary development in cardiovascular morphogenesis. We studied this relationship by excising the left lung bud of chick embryos prior to completion of intracardiac septation. White leghorn eggs were incubated to Hamilton-Hamburger stages 28-29. Embryos were exposed by opening the shell and membranes. The left thoracic wall was incised, lung bud amputated, and embryos reincubated. After fixation in 10% formol in chick Ringer's, the lungs and pulmonary vessels were microdissected, measured and compared using ratios of lung volume (L_l/L_r) and diameters of pulmonary arteries (A_l/A_r) and veins (V_l/V_r). Intracardiac abnormalities were evaluated after removing the free wall of right and left ventricles. The 65 stage-matched control embryos included 30 with sham thoracic incisions. Of the 85 surviving embryos undergoing lung bud excision, 16 had diminished left lung volumes ($L_l/L_r \leq .75$), 17 had small pulmonary arteries ($A_l/A_r \leq .86$), all had small pulmonary veins ($V_l/V_r \leq .82$) which correlated with their small lung volume ratios and 13 (72%) had 1 or more ventricular septal defects (VSDs). Supracristal VSD was noted in 11 (61%) and membranous VSD in 2 (11%). Two control embryos had membranous VSD (3%). We conclude that since lung bud excision can alter cardiac as well as pulmonary morphology, it is important to evaluate cardiopulmonary morphogenesis if basic mechanisms underlying clinical anomalies of heart and lung are to be understood.

918 THE TELECANTHUS-HYPOSPADIAS SYNDROME, J.F. Cordero and L.B. Holmes, Genetics Unit, Mass. General Hospital, Boston, MA.

The telecanthus-hypospadias syndrome is an X-linked dominant disorder in which affected males have a wide medial canthus (telecanthus) and hypospadias. Other malformations, such as cleft lip and palate, heart anomalies, imperforate or ectopic anus, may also be present. Many affected males are mentally retarded. Carrier females show only telecanthus.

We have evaluated two families in which the affected males have a severe expression of the disorder. In Family N. the affected infant had telecanthus, coronal hypospadias, cleft lip and palate, laryngotracheoesophageal cleft and ectopic anus. His mother had marked telecanthus and anosmia. This infant died at six months of age. In Family S. the affected infant had telecanthus bilateral cleft lip and palate and perineal hypospadias. He has normal development at six months of age. His mother has telecanthus, but does not have anosmia.

As these two patients demonstrate, the telecanthus hypospadias syndrome can present as a severe multiple malformation syndrome. Fortunately many males are more mildly affected. Since the female carrier has a 25% chance in each pregnancy of having an affected son, early recognition and counselling is very important.