919

FETAL & NEONATAL DISORDERS RELATED TO MATERNAL SMOKING. Richard Naeye, Pennsylvania State Univ., College of Medicine, Department of Pathology, Hershey, Pa.

Data from a large prospective study of pregnancy was used to analyze the interaction of maternal smoking with other environmental and genetic variables on the frequency of specific disorders fatal to fetuses and neonates. Cigarette smoking was found to have an independent association with increased perinatal mortality due to several disorders. In the first half of gestation, perinatal mortality due to abruptio placentae was 211% more frequent in smokers than in nonsmokers ($P<.02$). After midgestation perinatal mortality rates due to abruptio placentae were 53% greater ($P<.01$), Rh erythroblastosis fetalis 81% greater ($P<.01$), and congenital anomalies 43% greater ($P<.02$) in offspring of smokers than of nonsmokers.

46,865 placentas were available in which maternal smoking histories had been recorded. Abnormalities in these placentas provide plausible explanations for most of the excess fetal and neonatal mortality associated with cigarette smoking. The placentas of the cigarette smokers had a number of structural abnormalities characteristic of reduced maternal perfusion, including obliterative endarteritis and cytotrophoblastic hyperplasia in villi and necrosis of the decidua basalis at the margin of the placenta. Structural abnormalities were absent in the arteries of the decidua. Nicotine temporarily reduces uterine blood flow and thus provides a plausible explanation for the underperfusion. Increased carboxyhemoglobin in maternal blood may also play a role in the fetal and neonatal deaths.

920

GAS LIQUID CHROMATOGRAPHY OF KERATAN SULFATE IN THE KNIEST SYNDROME. Richard Nyako, Reuben Matalon, David L. Rimoin and Ira M.Rosenthal.Dept.of Peds. Univ. of Ill. Chicago, Ill. and Univ. of Calif, Torrance, Calif.

The Kniest syndrome is an autosomal dominant skeletal dysplasia characterized by dwarfism, dysmorphic facies, short extremities and joint swelling. Increased urinary excretion of keratan sulfate (KS) in this syndrome has recently been discovered. To identify further the KS in the Kniest syndrome, analysis of the purified KS was carried out using gas liquid chromatography (GLC). Mucopolysaccharides from urine of 4 patients with Kniest syndrome were isolated and KS was purified using Dowex-1 ion exchange chromatography. Keratan sulfate fractions were methanolyzed at 80° for 18 h. Amino sugars were N-acetylated with trifluoroacetic anhydride, and following silylation the material was analyzed by GLC. The Kniest KS was compared to Morquio KS and also to standard KS isolated from corneas and rib cartilage. The results indicate that the KS from Kniest and Morquio syndrome are identical. Equimolar amounts of galactose and N-acetylglucosamine were found, fucose, mannose, N-acetylgalactosamine and sialic acid, which are found in KS, were also present. The chromatograms of standard skeletal KS correspond to KS from these 2 syndromes. Urinary mucopolysaccharides from normal individuals show different chromatograms as do mucopolysaccharides from urine of a patient with Sanfilippo syndrome. These results indicate that GLC can be used to characterize KS in urine of patients with the Kniest syndrome. GLC may be useful for screening of skeletal dysplasias for keratan sulfaturia.

921

RENAL ABNORMALITIES IN FETAL ALCOHOL SYNDROME. Qutub H. Qazi, Akiko Masakawa, Doris H. Milman, Barbara McGann, Albina Chua, and Suraiya Alvi, Depts. of Pediatrics and Child Psychiatry, Downstate Med. Ctr., Bklyn.,N.Y.

Six of 32 patients with fetal alcohol syndrome were found to have developmental abnormalities of the kidneys. In only one patient investigation for renal pathology was made in the absence of clinical indication. In the other 5 cases the clinical indications were: palpable mass in the upper quadrants (2), pyelonephritis (1), painless hematuria (1), and renal failure (1). Renal anomalies included horse-shoe kidney (1), bilateral hypoplastic kidneys (1),unilateral hypoplastic kidney(3),and malrotated large dysplastic kidneys (1). Although the renal pathology was not of the same type, it is of interest that four patients had either unilateral or bilateral hypoplasia.

Abnormalities of renal development have not hitherto been considered a feature of the spectrum of anomalies characteristic of the fetal alcohol syndrome. The exact incidence of renal anomalies in fetal alcohol syndrome is unknown. If the renal investigations are undertaken only on clinical indication, then it should be borne in mind that anomalies such as simple malrotation and unilteral aplasia usually are well-tolerated and may not become clinically manifest till later in life. Although we have not studied all of our patients for renal anomalies, and even if such evaluations turn out to be normal, results so far indicate a 20% incidence of congenital renal abnormalities in fetal alcohol syndrome.

922

MAJOR MALFORMATIONS AMONG AUTOPSIED TWINS. Beth A. Smith, Shirley G. Driscoll, and Lewis B. Holmes, Massachusetts General Hospital, Children's Service, and Boston Hospital for Women, Department of Pathology, Boston.

The increased frequency of malformations among monozygous (MZ) twins has been attributed in part to the occurrence of the Duhamel spectrum of malformations, which ranges from sirenomelia to the VATER association and its component parts (Smith, D. W., Bartlett, C., and Harrah, L.M., in Birth Defects Original Article Series, Vol. XII, No. 5, p. 53-63, 1976). Among 2715 newborns autopsied at the Boston Hospital for Women from 1965 to 1977, including 146 twins from 97 twin pairs, malformations were more common among MZ than dizygous (DZ) twins: 23.7% to 13.6%. However, the greater frequency was due to conjoined twins, acardiac fetus, and anencephaly, all of which have been attributed to the twinning process.

None of the 58 MZ twins had the Duhamel pattern of malformations. However, 10 of 292 (3.4%) singleton controls and 4 of 88 (4.5%) DZ twins had the Duhamel anomalad. None of these 4 twin pairs was concordant.

Most (86%) MZ non-conjoined twin pairs were discordant for all malformations, except for ventricular septal defect. Zygosity was determined by examination of placentas; only monochorionic twins were considered monozygous.

923

EAR MUSCLES AND AURICULAR ANOMALIES. David W. Smith and Hiro Takashima, Univ. of Wash. School of Medicine, Dept. of Pediatrics, Dysmorphology Unit, Seattle.

Our studies of the auricular muscles in relation to auricular form in early development, utilizing both normal and abnormal examples, indicate that these muscles exert a major role in the form and positioning of the cartilagenous pinna. Defects in the development or function of specific ear muscles may give rise to particular deformations of the auricle. For example, defect of the posterior auricular muscle, which normally draws the ear toward the calvarium, gives rise to a protruding auricle. Defect of the superior auricular muscle, which attaches from the superior auricular cartilage to the temporal region, may result in an overlapped and low-set appearing ear--the so-called "lop" ear. Finally, defect of the intrinsic musculature of the concha may result in a lack of the usual folds such as the anthelix and give rise to a so-called "simple" ear.

Thus many defects of ear form constitute signs of neural and/or muscular aberration with secondary alteration in the form of the auricle, rather than being signs of a primary problem in the development of the cartilagenous external auricle itself.

924

CYTOGENETIC AND CLINICAL DEFINITION OF TRISOMY 8: BASED ON OBSERVATIONS IN PARTIAL TRISOMY 8(q13→qter). Mirja S. Somer, Ranjit K. Sachdev, Lotte Strauss, Sophie Paciuc, Lillian Y. Hsu. Mt. Sinai Sch. Med., Mt. Sinai Hosp., Dept. of Peds., Dept. of Path., New York, N.Y. 10029.

Trisomy 8 syndrome is a well documented clinical entity, consisting of mental retardation, micrognathia, cardiac and renal anomalies, skeletal defects and deep plantar creases. The few reported cases of partial trisomy 8p and 8q(distal part) did not exhibit the latter pathognomonic sign. We studied a neonate with major features of trisomy 8 syndrome, caused by partial trisomy 8(q13→qter), born after 28 weeks to a 26-year-old primipara with polyhydramnios. The autopsy revealed: hydrocephaly; large head with prominent glabella and flat occiput; prominent nose; webbing of the neck; low-set ears; microstoma; choanal atresia; micrognathia; wide-spaced nipples; shield-like chest; proximally placed thumbs; abnormal palmar creases; prominent foot pads; flexion contractures of toes and bilateral deep longitudinal plantar furrows. She also had cardio-pulmonary, intestinal and genito-urinary anomalies. Karyotyping of cultured lymphocytes with Q and G-banding revealed trisomy of the distal part of the long arm of No.8 in all 50 cells: 46,XX,t(6;8)(6pter→6q25::8q13→8qter). The mother showed a balanced reciprocal translocation 46,XX,t(6;8)(q25;q13). Comparison of this case with previous reports of trisomy 8 indicates that plantar furrows are of diagnostic significance in the newborn, and that the extra chromosomal material of 8q13→8qter is responsible for the major features of trisomy 8 syndrome.