hrs. Base deficits were significantly smaller for the first 3 hrs in the Group A and for the first 24 hrs for group C. The PaO_2 and $PaCO_2$ values were not significantly different between early and late Rx groups. The incidence of RDS between groups was similar. The degree of severity of RDS was significantly greater in the late treatment groups from 12–96 hrs of age. A higher mortality rate was observed in infants weighing between 1001–2250 gms with late Rx. This study suggests that early correction of neonatal acidemia favorably influences the course of RDS, and that it may reduce the mortality of infants between 1001 and 2250 gms.

DEVELOPMENTAL BIOLOGY

Cartilage ultrastructure in the chondrodystrophies. D. L. RIMOIN, R. SILBERBERG, R. L. KAUFMAN, and R. ROSENTHAL (Intr. by J. W. St. Geme). *Harbor Gen. Hosp., UCLA Sch. Med., Torrance, Calif., and Washington Univ. Sch. Med., St. Louis, Mo.*

The chondrodystrophies are a heterogeneous group of disorders which have been classified on the basis of clinical, radiographic and genetic criteria. Histopathological studies of costochondral junction and iliac crest biopsies have allowed for the further classification of these disorders on the basis of the type of derangement in endochondral ossification. Electron microscopic studies of resting cartilage from these biopsy specimens demonstrate that the chondrodystrophies may be further characterized on the basis of ultrastructural abnormalities in the chondrocytes or intercellular matrix.

For example in achondroplasia, a disease associated with normal endochondral ossification, no ultrastructural abnormalities are present in either the chondrocyte or the matrix. In the mucopolysaccharidoses, the matrix is ultrastructurally normal, but the chondrocytes are filled with large cytoplasmic vacuoles of possible lysosomal origin. These vacuoles are uniform in appearance in the Hurler syndrome whereas in the Sanfilippo syndrome, two distinct populations of vacuoles can be identified. These ultrastructural observations provide a further clue as to the specific pathogentic mechanisms operative in the bone dysplasias.

Subcellular studies of the abdominal musculature in the prune belly syndrome. D. T. MININBERG, K. OKADA, R. PERSUTTI, and F. MONTOYA (Intr. by M. Lending). *New York Med. Coll., N. Y., N. Y.*

Light microscopy and electron microscopy were used to study the abdominal musculature in two infants with the prune belly syndrome. The electron micrographs demonstrated derangement in the coherence of the Z lines and myofibrils. This evidence supports the theory of developmental arrest at a 10 week level. We believe this to be the first time these electron microscopic studies have been made.

"Skin age" as a predictor of gestational age. A study of within-litter and between-litter variability in fetal rabbits. MARY E. AVERY, WILLIAM L. TAEUSCH, and N. S. WANG. *McGill Univ., Montreal, Que., Canada*

Recent studies in fetal rabbits led to the hypothesis that organ systems may mature at different rates among littermates, and raised the question of which organs were coupled in maturation, and presumably responsive to the same regulators. The number of epiphyseal centers and body weight were closely correlated and could vary 100% between littermates. Lung distensibility and stability (lung age) was predicted by gestational age better than by body weight. (Kotas, Avery, Pediat. 47: 1971). "Skin age" was assessed by histologic criteria in 70 rabbits from 14 litters delivered between 22 days gestation and term (30 days). Significant morphologic changes were evident from 24 to 30 days. "Skin age" was remarkably constant between littermates regardless of their weight, and in this sense it resembled lung age. In rabbits, at least, the skin is a predictor of maturity.

Evaluation of human gestational age by albumin, IgG globulin, and alpha-1-fetoprotein measurements. M. A. HYVARINEN, P. ZELTZER, E. R. STIEHM, and W. OH. *UCLA Sch. of Med., Harbor Gen Hosp., Torrance, Calif.*

Serum albumin (Alb) and IgG globulin levels in the developing fetus increase with maturity because of an increasing placental passage from the maternal circulation to the fetus. In contrast, levels of alpha-1-fetoprotein (AFP) decrease with maturity from a maximum serum level at 20 weeks of gestation (mean level > 140.0 mg%) to trace levels (mean 5 mg%) at 40 weeks gestation. These observations permit an estimation of gestational age by measuring levels of cord blood IgG, Alb, and AFP, and when paired maternal IgG and Alb levels are available, by calculating fetal/maternal IgG and Alb ratios. Cord sera (and the matched maternal sera) from 55 infants (23 preterm, 32 term) on whom gestational age had been estimated by maternal history and physical examination (Dubowitz criteria, J. Ped. 77:1, 1970) were studied. Gestational age was correlated ($p < .001$) directly with cord levels of IgG ($r = 0.81$) and Alb ($r = 0.76$) and inversely with AFP ($r = -0.79$). Birth weight was also correlated ($p < .001$) with cord IgG ($r = 0.79$), Alb ($r = 0.73$) and AFP ($r = -0.76$). Using a fetal/maternal IgG and Alb ratio did not result in an improved correlation. Although AFP was detected in all cord sera, AFP was not detected in the maternal circulation, nor in 14 of 15 amniotic fluid samples. Cord IgG and albumin levels best reflect gestational duration while cord AFP levels reflect fetal maturity.

Early fetal expression of genes for lysosomal enzymes. C. RONALD SCOTT, SANDRA H. CLARK, and JOHN S. O'BRIEN. *Univ. of Wash., Seattle, and Univ. of Calif., San Diego, Calif.* (Intr. by R. J. Wedgwood.)

Deficiency of specific lysosomal enzymes have been increasingly implicated in childhood storage diseases and the activity of these enzymes in cultured amniotic fluid cells has been used as an indicator of fetal genotype. To establish the time of expression of the genes for lysosomal enzymes during early human development, the activity and electrophoretic mobility of selected lysosomal enzymes were determined in fetal liver between 40 and 156 days' gestation and compared to infant and adult values. Only fetal liver obtained from therapeutic abortions performed by hysterotomy and dated by crown-rump measurements was selected. β-Glucosidase, β-glucuronidase, N-acetyl-glucosaminidase, α-glucosidase and β-galactosidase were assayed using their respective p-nitrophenol substrates. Activity of each enzyme was present in the earliest specimens and the specific activity remained constant between the 5th and 22nd week of gestation and were similar to those measured in infant and adult livers. Starch-gel electrophoresis was performed on those two enzymes, β-galactosidase and N-acetyl-glucosaminidase, known to have more than a single molecular form; there was no difference in their electrophoretic patterns during development.

This study establishes that for the five lysosomal enzymes