199 ARGININE VASOPRESSIN (AVP) IN FETAL LAMBS & RESPONSE TO BLOOD LOSS. W.H. Drummond, A.M. Rudolph, L.C.Keil & M.A. Heymann. U. of Calif., S.F., Dept. Peds, Physiol. & Ob-Gyn & NASA-Ames Research Center, Moffett Field, Ca.

The fetus appears to be capable of homeostatic regulation of its fluid environment in utero. Possible hormonal modulation mechanisms influencing cardiovascular homeostasis include AVP, which in adult animals is released from the posterior pituitary in response to hyperosmolar stimuli or volume depletion. Fetal AVP production was studied in chronically prepared unstressed fetuses and in acutely hemorrhaged fetuses from 0.4 of gestation to term. Serum levels of AVP were measured by specific radioimmunoassay. Assay cross reactivity with fetal arginine vasotocin and angiotension I was negligible. In chronically catheterized fetuses, basal AVP levels rose from 0 pg/ml at gestation age (GA) 112d to 2.4 pg/ml (5mU/ml) at GA 140d. Epidural anesthesia to the ewe and acute catheterization of the fetus was associated with mean fetal levels of 14.9 pg/ml. In these fetuses, sequential hemorrhage of 5 to 20% of total blood volume resulted in an increase of serum AVP. Mean AVP levels for 4 fetuses 130-148 GA were 48.1 pg/ml after 5% bleeding, 200.1 pg/ml after 10%, 106 pg/ml after 15% and 151 pg/ml after 20%. A very early gestation fetus (GA 59) had a higher basal level after anesthesia and exteriorization: 56.8 pg/ml. This increased only to 69.1 pg/ml after 10% hemorrhage. That such a large release of this membrane active hormone is present early in gestation when the kidneys are extremely immature, suggests that AVP may act to control water metabolism at membrane surfaces other than renal in the fetal placental unit. Supported by USPHS Grant HL 06285.

200 EXPRESSIVE APHASIA IN CONGENITAL RUBELLA SYNDROME. Lytt I. Gardner and Phillip I. Nieburg. Dept. of Peds., SUNY, Upstate Med. Ctr., Syracuse, N.Y.

Language disorders in children with congenital rubella syndrome (CRS) have usually been associated with autism, deafness or mental retardation, or to some combination of these. The present report concerns a child with CRS and expressive aphasia not attributable to the three named causes.

This now 12 year old girl was born in Sept. 1964 to a mother who was exposed to and had symptoms consistent with rubella near the time of conception. Pregnancy lasted 42 weeks; birth wt. was 2380 gm (older sibs were 3600 and 4500 gm). No abnormalities were noted then or later. She could drink fluids without difficulty; she choked frequently on solids. There was drooling and "snorting" throughout childhood. Development was age-appropriate except for speech. She said "mama" at age 16 mos. but never progressed further. At age 4 a neurologist suggested an isolated bulbar palsy as the cause of the speech disorder. EEG was normal. Hearing is entirely normal. She is in an age-appropriate grade in public school, communicating with the aid of the sign language of the deaf, which has been taught to her by volunteers. She is aphasic with severe motor involvement of the lips and tongue. Performance is good on non-verbal developmental tests.

In the evaluation of language disorders in children with CRS isolated neuromuscular disease such as shown by this patient should be considered.

201 FERRITIN SYNTHESIS IN HUMAN EMBRYONIC AND FETAL TISSUES. Jonathan D. Gitlin, Joan I. Gitlin and David Gitlin. University of Pittsburgh School of Medicine, Children's Hospital of Pittsburgh, Department of Pediatrics, Pittsburgh, Pennsylvania.

Ferritin synthesis by various tissues of the human conceptus was examined in the present study using tissue cultures. Normal embryonic and fetal tissues were obtained from 21 spontaneously or therapeutically aborted conceptuses of 29 days to 21 weeks of gestation. The tissues were cultured in the presence of ^{14}C-amino acids and the culture fluids were examined for synthesized radioactive ferritin by means of immunodiffusion and autoradiography. Ferritin synthesis was detected in the earliest embryo studied, 29 days of gestation; this embryo was too small to permit culture of individual tissues and all tissues were cultured together. Ferritin synthesis by the liver and yolk sac was clearly established at the earliest stages in which these organs were cultured separately, 4.5 and 5.5 weeks of gestation, respectively. Synthesis of ferritin by bone marrow was detectable in some embryos at 8.5 weeks and was established in this tissue and in the spleen by 11 weeks. The chronological development of ferritin synthesis from liver and yolk sac to bone marrow and then spleen approximates the ontogenetic development of hematopoiesis. Ferritin synthesis was noted in the stomach and duodenum at 8.5 weeks, but was not well established at these sites until 21 weeks, suggesting possible induction of ferritin synthesis in the latter organs through fetal swallowing of amniotic fluid containing transferrin iron.

202 DEVELOPMENTAL CHANGES IN THE PROPERTIES OF LIVER GLUCURONYLTRANSFERASE IN RATS. Ruth Goldstein, David Zakim, David Vessey and M. Michael Thaler. University of California, Moffitt and San Francisco VA Hospitals, Departments of Pediatrics and Medicine, San Francisco.

The molecular basis for postnatal changes in glucuronyltransferase (GT) activity is not understood. The mechanisms underlying these changes were studied in fetal (F), newborn (N), and adult (A) rats using p-nitrophenol (PNP) as acceptor substrate. When assayed at 2 to 4 mM UDPGA, GT activity in F and N was greater than in A. Kinetic analysis revealed that the apparent K_m for UDPGA at 0.4 mM PNP was 4 to 6 mM for F and N, and 13 to 16 mM for A. When assayed at saturating concentrations of UDPGA, GT activities in F, N and A were equivalent. Hence, the differences in activity of F, N and A at 2 to 4 mM UDPGA are due to differences in affinity of GT for UDPGA. UDP-N-acetylglucosamine (UDPNAG) is known to increase the affinity of GT for UDPGA in mature liver. UDPNAG increased GT activity 3 to 4-fold in A in the presence of 1 mM UDPGA, but had no effect in F or N. However, an activating effect of UDPNAG on GT was observed in N when the concentration of UDPGA was reduced to 0.1 mM, i.e., far below the apparent K_m. These data indicate that developmental changes in synthesis of PNP-glucuronide reflect the activities of different functional forms of GT. Small amounts of the A form of GT are present at 5 days post partum, and complete development of the A form is achieved by 20 days after birth.

203 ELEVATED CORD BLOOD FREE ERYTHROCYTE PORPHYRIN (FEP) - A SIGN OF "MASKED" IRON DEFICIENCY? Michael A. Gottuso, Barbara F. Oski and Frank A. Oski. SUNY, Upstate Medical Center, Syracuse, N.Y.

Elevations of FEP are recognized to be a sign of both lead poisoning and iron deficiency. Cord blood FEP values were previously observed to be higher than those found in normal children and adults. The mean cord blood FEP was 94 µgm/100 ml RBC's as contrasted with a value of 50 + 20 in the older population. In infants with elevated cord blood FEP values, blood leads were less than 15 µg/dl. In a further attempt to explain marked variations in cord blood FEP values, infants with high and low FEP levels had determinations of serum iron and iron binding capacity performed. Twenty infants with FEP values of less than 55 µg/100 ml RBC's had a mean serum iron of 177 µg/dl and a mean transferrin saturation of 72%. In contrast, 10 infants with FEP values in excess of 125 µg/100 ml RBC's had a mean serum iron of 127 µg/dl and a transferrin saturation of 42%. Both values were significantly lower ($p < .005$) in the infants with elevated FEPs. Although these levels of serum iron and percent transferrin saturation are not normally regarded as evidence of iron deficiency in older infants and children they may in fact reflect suboptimal iron stores during a period of intense erythropoiesis. Cord blood FEP determinations could provide a simple means of detecting the infant at risk for the development of early iron deficiency.

204 ALTERED ENZYME PROFILES IN OBESITY. M.R.C. Greenwood, M.P. Cleary, D.Blase & J.A.Brasel Inst. Human Nutrition & Dept. Pediatrics & Genetics, Coll. Physicians & Surgeons, N.Y.,N.Y. 10032

Early-onset obesity is a life long chronic disease, generally refractory to therapy, characterized both in man and rodents by hyperplasia and hypertrophy of adipocytes. A means of early diagnosis would be clinically very useful. Enzymatic changes have already been noted in the genetically obese rat(fa/fa) vs its lean littermate(Fa/-). Elevated DNA polymerase and total thymidine kinase(TK) activities were noted until 26wks of age in fa/fa, but reached normal adult levels by 28d in Fa/-. In recent work TK has been separated by gel electrophoresis into its proliferative and nonproliferative variant forms. The proliferative:nonproliferative ratio is greater in fa/fa vs Fa/- at 5 weeks. When hypertrophy is assessed by measuring lipoprotein lipase (LPL) activity, LPL per fat cell is elevated in fa/fa rats at 5,10&14 wk of age. Further examination of the enzyme preparation indicates that the Vmax is 10-fold greater in epididymal and retroperitoneal pads at 5&10wk in fa/fa rats. Further study will be necessary to establish the importance of these changes in the genesis of obesity. However since both TK and LPL can be measured in 20-40mg of adipose tissue, they may be useful tools in assessing the onset of obesity in needle biopsies from at-risk infants and children.