1237 PHENYLALANINE METABOLITES IN TREATED PHENYLKETONURIC CHILDREN. Kimberlee Michals and Reuben Matalon, University of Illinois at Chicago, Departments of Nutrition and Medical Dietetics and Pediatrics.

The levels of the organic acids of phenylalanine: phenylacetate, phenylpyruvate and phenyllactate, and the biogenic amine, phenylethylamine (PEA) are increased in untreated phenylketonurics. There is no data regarding these neurotoxic substances in treated patients with phenylketonuria (PKU). Nineteen children with PKU, ages 2-10 years were examined for these metabolites. All children were on treatment with blood phenylalanine levels ranging from 2.4-22.2mg/dl. Phenylalanine metabolites were assayed in freshly collected urine samples. The organic acids of phenylalanine were determined by gas chromatography/mass spectrometry and PEA was determined following precolumn derivitization with dansyl chloride and isolation by high performance liquid chromatography. Phenylalanine metabolites were detected in some patients with blood phenylalanine levels below 6mg/dl. When blood levels of phenylalanine were 12-22.2mg/dl the mean excretion of phenylacetate was 237.9, phenylpyruvate was 829.7, and phenyllactate 2294.2mg/gm creatinine. These compounds are usually not detected in normal urine. Levels of PEA were 2.6 - 53.8ng/mg creatinine (normal 0.06-0.13). The increased levels of phenylalanine metabolites in PKU patients is of concern with regards to acceptable levels of blood phenylalanine in the treatment of PKU. Since loss of academic achievement in treated PKU children has been noted, lowering the levels of these metabolites may be of importance in the follow-up of children with PKU.

†1238 BONE MINERAL CONTENT (BMC) OF INFANTS OF DIABETIC MOTHERS (IDMs). Francis Mimouni, William Brazerol, Jean Steichen, Reginald C. Tsang. U. of Cincinnati.

Infants of diabetic mothers have a higher incidence of neonatal hypocalcemia and hypomagnesemia. Decreased BMC has been reported in diabetic patients, with bone mineralization of IDM has not been systematically evaluated. The present study was done to test the hypothesis that decreased neonatal BMC in IDMs is correlated with poor control of diabetes during pregnancy & with the development of neonatal hypocalcemia. 54 fullterm IDMs & 55 normal fullterm controls, infants of non-diabetic mothers were prospectively studied. Mothers of IDMs were classified prospectively in 3 groups: group 1-strict control of diabetes from the first trimester; group 2-customary control from the first trimester; group 1 & 2 were randomized; group 3-late entry (after first trimester) in the study. Maternal BMC was measured prior to delivery. Infant serum calcium was measured at age 24 & 72 hours, & infant BMC at age 3 days. Multiple regression analysis shows that: 1) infant's BMC is not correlated with maternal BMC, neonatal hypoglycemia, neonatal hypocalcemia & infant weight percentile; 2) IDMs from group 2 & 3 had significantly lower BMC than IDMs from group I ($p<0.02$); 3) IDMs from group 1 & controls had similar BMC. It appears that decreased BMC is observed in IDMs & may be prevented by strict control of diabetes during pregnancy. Decreased BMC in IDMs does not seem to play a role in the pathogenesis of neonatal hypocalcemia. We speculate that decreased BMC in IDMs might be in the diabetic pregnancy inappropriate calcium supply through the placenta.

1239 DETECTION OF GESTATIONAL DIABETES IN THE FIRST TRIMESTER:ABNORMALITIES IN CELL MEMBRANE STRUCTURE AND FUNCTION. Naomi D.Neufeld, Lucille Corbo, and Sherry Brunnerman. UCLA School of Medicine, Cedars-Sinai Medical Center, Department of Pediatrics, Los Angeles

Detection of gestational diabetes (GD) is currently limited to the last trimester, whereas the associated fetal abnormalities occur early in pregnancy due to disturbances in maternal metabolism. We have studied 39 pregnant subjects with varying degrees of carbohydrate tolerance at intervals during pregnancy. Heparinized blood samples (10-15cc) were obtained from all subjects after an overnight fast, for studies of $^{[125]}$I-insulin binding, membrane phospholipid (PL) and membrane fluidity determinations using fluorescence polarization (FP).

GROUP	$^{[125]}$I-INSULIN %bound/10^6cells	FP @25°C	PL/PROT (ug/mg)
NORMAL (27)	5.1+1.2	0.314+.010	0.25+.03
GD (12)	1.9+.25**	0.375+.001*	0.12+.01*

**P<0.02, *P<0.005 vs NORMAL

The data suggest that a defect in insulin binding and insulin action is present in women with GD, associated with disturbances in both membrane structure and biophysical behavior. This defect, similar to that seen in obese, Type II diabetic subjects is detectable before 12 weeks' gestation. Early detection of GD, permitting the institution of appropriate measures of metabolic control in these subjects, should result in marked reduction of perinatal morbidity.

1240 PLATELET MONOAMINE OXIDASE (MAO) ACTIVITY IN REYE'S SYNDROME (RS). Stephen L. Newman, Bajhat A. Faraj, Daniel B. Caplan, Michael Kutner, Farrouk M. Ali, Julie A. Lindahl (Spon. by Maurice D. Kogut). Wright State Univ. School of Med., Dept. of Ped. and Emory Univ. School of Med., Depts. of Radiology, Ped., and Biometry; Dayton and Atlanta.

In patients with RS we have shown that MAO activity was significantly reduced in liver and tyramine, dopamine, norepinephrine, epinephrine, and octopamine were increased in plasma, urine, and cerebrospinal fluid. The purpose of the present study was to determine whether generalized MAO dysfunction is a metabolic abnormality associated with RS.

Platelet and liver MAO activities were evaluated by radioenzymatic technique in RS and control patients. Platelet MAO activity was significantly decreased ($p<0.025$) in RS patients ($n=13$) [3.3 ± 2.4 nmoles of [^{3}H]4-hydroxy-phenylacetic acid formed x (mg protein)$^{-1}$ x hr^{-1}] when compared to control patients without liver disease ($n=8$) [9.8 ± 2.5 nmoles] and in non-RS liver disease patients ($n=9$) [9.1 ± 2.0 nmoles]. Following recovery platelet MAO levels in RS patients were not significantly different from controls. In contrast, there were no significant differences between hepatic MAO activities in RS patients and those without liver disease or non-RS liver disease. Conclusion: 1) reduced platelet MAO activity is a specific abnormality in RS and represents generalized mitochondrial dysfunction; 2) the pattern of MAO activities in platelet and liver may differentiate RS from other hepatopathologic states; 3) the disturbance of MAO activity may be responsible for hypercatecholaminemia and neurologic dysfunction in RS patients.

1241 ALPHA-MANNOSIDOSIS: LACK OF CORRESPONDENCE BETWEEN ENZYME ACTIVITY AND COGNITIVE DEVELOPMENT. Robert Noll, Roshni Kulkarni, and Michael Netzloff. Mich. State Univ., Dept. of Pediatrics/Human Development, E. Lansing.

Three brothers with hepatomegaly and delayed motor and language development were assessed both biochemically and cognitively. The diagnosis of α-mannosidosis was confirmed by leukocyte enzyme assays for mannosidase which was severely deficient in all three, ranging from 0.6 to 1.2% of normal; thus we anticipated the patients would be profoundly retarded as is true in all other reported cases.

The oldest brother received intelligence testing at 44, 54 and 70 months; the middle brother was tested at 37, 40 and 51 months; and the youngest brother was evaluated at 24 months. Results of the assessments using the Stanford-Binet, McCarthy, Bayley and WPPSI, showed borderline to mild mental retardation (I.Q. range: 60 to 75). During follow-up evaluations, none of the patients demonstrated any significant changes in test scores. Profile analysis of McCarthy and WPPSI subtest scores showed no distinct areas of strength or weakness.

These patients showed mild, uniform, non-progressive intellectual deficits, despite the severe enzyme deficiency. They do not show the expected correspondence between biochemical and intellectual findings and surprisingly, they show no signs of progressive deterioration of intelligence. This lack of correspondence may have resulted from enzyme activity in other tissues that is greater than that reported in leukocytes or because the duration of follow-up testing was too short. These data demonstrate the need for systematic intellectual evaluation of patients with storage disease.

1242 INCREASED INSULIN IN NEWBORN INFANTS OF DIABETIC MOTHERS (IDM): EVIDENCE FOR FUNCTIONAL MATURATION RATHER THAN SIMPLE INCREASE IN ISLET NUMBER. Edward S. Ogata, Norbert Freinkel, Boyd Metzger, John Boehm, Richard Phelps. Northwestern Univ. Med. School, Depts of Peds, OB-Gyn, Med, Cntr Endo Metab Nutr, Chicago, IL

We and others have demonstrated that cord C-peptide/glucose (C-P/G) is often ↑ in IDM. This ↑ static response to ambient glucose at birth could be due to (a) ↑ islet number with normal sluggish neonatal function/islet; (b) normal islet number with adult-like functional maturation islet; or (c) both. We assessed these possibilities by determining insulin secretion during i.v. glucose tolerance tests in 45 term, healthy, newborn IDM (Classes A-D). Absolute values for plasma C-peptide (C-P) and 2 min C-P increments above basal were used as indices of acute secretory response, i.e. "first phase stimulated insulin secretion" and integrated ↑ in C-P during 30 min following glucose as indices of "first plus second phase stimulated secretion". Absolute 2 min C-P values and 2 min C-P increments above basal correlated with cord C-P/G ($r = .672$ and $.693$; $p < .001$). The 30 min integrated C-P ↑ also correlated with cord C-P/G ($r = .683$; $p < .001$). Moreover, the acute first phase and integrated first and second phases correlated with rates of glucose disappearance, K_t ($r = .579$ and $.698$, $p < .001$). The data provide the first demonstration that heightened insulin in relation to ambient glucose in newborn IDM reflects true functional maturation of exocytosis and that this adult-like responsiveness may determine the heightened glucose turnover in newborn IDM.