1182 INTRACRANIAL (IC) HYPERINSULINISM DECREASES WHILE SYSTEMIC HYPERINSULINEMIA (SI) AND ALLOXAN (AL) INDUCED MATERNAL DIABETES (MD) DO NOT ALTER FETAL (F) BRAIN (B) INSULIN (I) RECEPTORS (R) S.Devaskar, N. Holkamp, N.Marino, F.Solomon, and U.Devaskar (Spons.W.J.Keenan) Dept. of Peds., St. Louis University, St. Louis, Missouri

The local effect of I on B IR is unknown; adult B IR are not modulated by plasma I levels. The effect of IC I vs. SI on 27d. F rabbit B plasma membrane (PM) IR were separated by the injection of 2U NPH I IC (ICI) or IM (IMI) in utero; (saline to controls, ICS or IMS). On 28d. (term~31d) ^{125}I-I binding (IB), IR no.x10^{10}mg prot:$^{-1}$and affinity (Kex10^{8}=0.73±0.04) were determined and IB to a systemic organ, heart(H) was examined. 30d. F of AL-MD (D), AL treated non-diabetic(ND) and controls(C) were also studied Extracted BI content in ICI was ~x800 the IMI and ICS, protein and DNA being constant. Plasma glucose ↓ in ICI and IMI* and ↑ in D*.

GROUPS(n)	ICI(6)	ICS(5)	IMI(5)	IMS(5)	D(5)	ND(5)	C(6)
PlasmaI X±	892.0*	22.0	288.0*	14.0	65.0*	17.0	26.0
(μU/ml) SE.	180.0	1.0	51.0	2.0	14.0	2.0	4.0
B-IB/	4.9*	11.1	10.5	12.2	10.6	8.6	11.7
200μg BPM	0.6	1.0	1.2	0.5	1.3	0.8	0.6
B-IR No.	109.0*	175.0	199.0	190.0	173.0	138.0	175.0
	17.0	15.0	4.0	9.0	14.0	17.0	12.0
Heart IB/	1.6*	3.6	2.3*	3.6	4.8*	-	3.6
100μg	0.1	0.2	0.1	0.4	0.7		0.7

*(p<.02 vs. control)

^{125}I-I IC or IM injections (n=4) revealed the ↓ in ICI B IR to be not due to prior binding with IC NPH I; a B to blood access of I with no blood to B entry. We conclude:SI and IC I ↑ plasma I and alter H IB, but IC alone downregulates B IR.

1183 UNCOOKED CORNSTARCH (UCS): A DIETARY SOURCE OF CONTINUOUS GLUCOSE FOR PATIENTS WITH TYPE I GLYCOGENOSIS (GSD-1): I. ACUTE STUDIES. Ruth A. Flowers, Joseph I. Wolfsdorf, John F. Crigler,Jr., Department of Pediatrics, Harvard Medical School, Department of Medicine, Children's Hospital, Boston, MA.

Metabolic and hormonal responses following UCS (1gm/kg in 120ml water) were compared with those following an equal amount of dextrose (D) in 9 patients (age 4-15yrs) with GSD-1 to determine its effectiveness in supplying their glucose requirements. The 9 patients had received 1-3hr daytime D feedings and a continuous overnight intragastric dextrose infusion (COD) for 1-9.4yrs. Blood glucose (BG), pH, CO_2, lactate (L), lipids and uric acid (UA) prior to the UCS load were normal in 4 subjects. 5 had normal BG but somewhat elevated L, lipids and UA.

Following UCS, maximum BG level was 80±4mg/dl at 108±32min. and BG remained >50mg/dl for 215±37min (all M±SEM). Peak serum insulin (IRI) was 13±3μU/ml and occurred after 128±43min. Basal blood L was 5.4±1.1mM/L and at 3hr was 7.3±1.0mM/L, p<0.05. After D, peak BG (143±7mg/dl) and IRI (61±13μU/ml) occurred at ≈1hr. BG remained >50mg/dl for 135±8min. Blood L decreased significantly from 5.3±1.1(t=-1min) to 3.3±0.5mM/L (t=150min), p<0.05. There was a significant inverse correlation (r=-0.81, p<0.001) between L and mean BG (-1→180min) after both UCS and D. Blood L remained unchanged or decreased only when the mean BG exceeded 70mg/dl.

These data suggest that UCS acts as an intestinal reservoir of glucose and, therefore, may provide the continuous source of glucose required to correct metabolic abnormalities in children with GSD-1.

1184 IMPROVED METABOLIC CONTROL-A CAUSE OF DIABETIC NEUROPATHY. John A. Duncan, Maria A. Gieron, John I. Malone, University of South Florida, Tampa.

Two adolescents, both 17 years, began intensified therapy to improve glycemic control (HbA_{1c} 17.0%, 9.0%). Physical examinations were normal. Baseline neurophysiologic studies (Biothesiometry and NCV) demonstrated mild sensory nerve dysfunction, not due to heavy metal toxicity or vitamin deficiency. Intensified conventional diabetes therapy improved their diabetes control. Hb A_{1c} values were <8.5% at 8 weeks after beginning therapy. Four to six weeks after beginning therapy, each patient developed distal, symmetrical polyneuropathy characterized by pain and/or numbness of extremities. Despite improved metabolic control, repeat neurophysiologic studies were unchanged. A 15-year-old female presented with right facial paresis and pedal dysesthesias. Her glycemic control was similarly improved(Table). Six weeks later she reported severe leg pain and worsening of existing symptoms without neurophysiologic change. In all three patients, symptoms completely subsided in 3 to 4 months without improvement in neurophysiologic tests.

Improved metabolic control may exacerbate silent or overt neuropathy in young diabetics. Resolution of symptoms in response to treatment protocols may not indicate improved nerve function.

HbAlc	Pt 1	Pt 2	Pt 3
Presentation	17.0%	9.0	8.5
8 wks	7.0%	8.5	5.1
16 wks	8.4%	6.1	8.7

†1185 ROLE OF GAMMA-GLUTAMYL TRANSPEPTIDASE (GGT) IN AMINO ACID TRANSPORT. J.W. FOREMAN, B. HSU, S. CORCORAN, K. GINKINGER, S. SEGAL. U. of PA. School of Medicine, Children's Hosp. Dept. of Peds., Phila., PA 19104.

GGT, which is concentrated on the renal proximal tubule brush-border membrane, is postulated to be important for the renal reabsorption of amino acids. Acivicin (AT-125) is a potent inhibitor of GGT allowing examination of this hypothesis. AT-125 inhibition of GGT activity in brushborder membrane vesicles (BBMV) from adult rats was both temperature and time dependent. After 20 min. of incubation at 37°C, 0.25 mM AT-125 inhibited 98% of GGT activity in BBMV. This inhibition was not reversed with repeated washing consistent with an affinity site inhibitor. AT-125 had no effect on another BBMV enzyme, alkaline phosphatase. AT-125 (20 mg/kg body weight) given to adult rats prior to BBMV isolation inhibited GGT activity by 90%. Cystine and glutamine uptake by AT-125 treated BBMV was unaffected, despite the fact that these amino acids are excellent substrates for GGT. AT-125 also had no effect on the BBMV uptake of proline, glycine, methionine, leucine and lysine. Cystine uptake by isolated renal cortical tubules prepared from rats treated with AT-125 was also unaffected, indicating that GGT inhibition had no effect on whole cell amino acid transport. These data suggest that GGT plays little or no role in renal amino acid transport.

1186 INSULIN RESISTANCE (IR) IN TURNER SYNDROME (TS): DETECTION BY DIMINISHED IN VITRO RESPONSE OF ERYTHROCYTE PROGENITOR CELLS (EPC) TO INSULIN. Mitchell E. Geffner, Solomon A. Kaplan, Noelle Bersch, Barbara M. Lippe, David W. Golde. UCLA School of Medicine, UCLA Medical Center, Departments of Pediatrics and Medicine, Los Angeles.

In 6 untreated patients with TS [mean age (MA)=18.3±2.29 yr, mean body mass index (MBMI)=21.5±0.75 kg/m^2], mean plasma glucose during an OGTT was significantly higher at 120 min (p<0.05) than in 6 female controls [MA=27.2±1.54 yr, MBMI=20.9±0.78 kg/m^2 (p=NS vs TS)]. This occurred despite a higher mean insulin concentration at 120 min and a higher mean integrated insulin response in TS (both p<0.05 vs controls). To document the presence of presumed IR, we measured insulin sensitivity in vitro by the EPC assay. EPC showed a mean proliferative response of only 60.0±11.6% above baseline in TS vs 95.0±4.65% for normal females (p<0.01). We have previously reported a much greater reduction in EPC response (26.7±9.11% above baseline)in obese hyperinsulinemic subjects with more severe insulin resistance. In an attempt to localize the site of IR in TS patients, insulin receptor binding of peripheral monocytes was examined. Binding in TS was heterogeneous with 4 subjects manifesting normal binding while the other 2 had diminished binding sites. Binding did not correlate with in vitro insulin sensitivity.

In summary, abnormal disposal of oral glucose occurs in TS. This appears to be due to IR as shown by the sensitive in vitro EPC assay system in which diminished EPC proliferation occurred in response to added insulin.

1187 EFFECT OF DIETARY SODIUM DEPRIVATION DURING PREGNANCY. Barbara A. Glista, Jeffrey Levine, and Burton P. Fine. (Spon. by O. Robert Levine), UMDNJ-New Jersey Medical School, University Hospital, Department of Pediatrics, Newark, NJ.

Sodium is an essential nutrient for growth. The effects of its deficiency during gestation remain controversial. Some studies have shown fetal growth retardation while others have shown no effect. This study investigated the effects of graded sodium restricted diets on maternal and fetal growth. Thirty-four three day pregnant,S-D rats were randomized into four different sodium intake groups. The total sodium dose during the experiment was: 7000ueq(Control),5000ueq(E_1), 3000ueq(E_2), 1000ueq(E3). On day 20 of gestation the pregnancies were terminated. There was no difference in litter sizes. Analysis of covariance for litter weight to litter size for the four groups showed no difference in fetal growth.

	Mat. Minus Fetal Wt.Gain	Mat. Bone Na (ueq/gm)
C	35±3.3	247±1.4
E_1	29±5.5	236±2.4
E_2	6.9±4.6	228±4.6
E_3	-10.8±4.0	212±3.6
ANOV	P < .001	P < .001

The maternal minus fetal weight gain was linear to total sodium ingested Y=17.3+008X, p<.001, r=0.83, as was maternal bone sodium concentration Y=210+.0053X, p<.001, r=0.79. There were no differences in fetal concentrations of N, Na, K, Cl, Ca or fat. We conclude that graded sodium deficient diets during gestation cause a proportionate loss of maternal weight and bone sodium but cause no significant fetal growth retardation.