LATIN-AMERICAN SOCIETY FOR PEDIATRIC RESEARCH

Abstracts for the 27th Annual Meeting November 5-8, 1989—San Bernardino, Paraguay

President

Carlos Caballero
Paraguay

President-Elect

Ary L. Cardoso
Brazil

Secretary-Treasurer

Julio Espinoza
Chile

1

NEUROPEPTIDE Y (NPY) PARTICIPATES IN THE CARDIOVASCULAR REGULATION IN THE NEWBORN LAMB. J.Carrasco, E.Sanhueza, C.Gaete, R.Riquelme, V.H.Parraguez, A.Daniels, A.J.Llanos. Depto.Ciencias Preclínicas. Med.Oriente, Universidad de Chile; Welcome Research Laboratory. Div. of Med. Biochem., North Carolina, USA.

NPY, a 36 amino acid peptide, is one of the most active vasoconstrictor agents in the systemic and pulmonary circulation. NPY plasma concentration in adults increases during stress. Human newborns have high plasma NPY concentrations, but it is unknown whether it participates as mediator of the cardiovascular response to stress in the neonatal period. We measured cardiac output (radioactive microspheres) and aortic and pulmonary artery blood pressures and calculated systemic and pulmonary vascular resistances in 6 newborn lambs (22.8±2.9 days) before and during NPY administration, placing catheters in the pulmonary artery, descending aorta, left ventricle and inferior vena cava. A bolus of 4 nM/kg of NPY followed by an infusion of 0.2 nM/min x kg for 30 min was given 1 or 2 days after surgery after a basal period of 20 min. Aortic and pulmonary blood pressures were registered continuously and cardiac output was measured at 0 min, 15 and 30 min during NPY infusion. The results were ($\bar{x}$ ±SEM; *p<0.05, Friedman test):

	Basal	NPY
Systemic arterial pressure (mmHg)	84.9 ± 4.9	90.5 ± 5.0*
Pulmonary arterial pressure (mmHg)	10.9 ± 1.3	13.5 ± 1.0*
Cardiac output (% of basal)	100	75
Systemic vascular resistance (% of basal)	100	143
Pulmonary vascular resistance (% of basal)	100	165

NPY increased systemic and pulmonary vascular resistance. These changes along with the possible decrease of coronary blood flow could explain the fall in cardiac output. This will result in a decrease in pulmonary and systemic perfusion. These results suggest that NPY could be a mediator in the blood flow redistribution observed during stress. If its action become exaggerated, failure of some of the compensatory cardiorespiratory mechanisms during stress in the neonatal period can occur causing the death of the newborn.

2

GLUTAMINE INCREASES SODIUM ABSORPTION IN WHO-ORS PERFUSED INTESTINE OF NORMAL AND DIARRHEIC RATS. M.Torres Agüero, R.Vicich, E.Camuega, A.O'Donnell. CESNI. Hospital de Pediatría J.P.Garranhan, Buenos Aires, Argentina.

Aiming at improving WHO-ORS's water and sodium absorption, "super ORS's" have been assayed clinically without distinct advantages. Glutamine (gln) is the main energy substrate for the enterocyte (it's metabolism produces 50% of the enterocyte's CO₂ productions) and is actively absorbed by a Na⁺ dependent carrier similar to that of Na⁺/glucose. During fasting, glutamine reaches the enterocyte via the blood flow. Stress, acidosis, and decreased splanchnic irrigation, during severe diarrhea decreases the plasma concentration of glutamine. We hypothesized that addition of glutamine to WHO-ORS may enhance Na absorption during diarrhea, by providing a substrate for the epithelium and for other ATP-dependent carriers. We perfused 20 - 30 cm of intestine, immediately distal to the ligation of a Treitz of 34 Wistar rats, 28 days after weaning. In 17 diarrhea was induced with sodium citrate and phenolphthalein; 17 acted as controls. Perfusates were WHO-ORS (Na 90 mM, glucose 11 mM, K 20 mM, Cl 80 mM and NaHCO₃ 30 mM/l) and WHO-ORS plus glutamine (30 mM/l). PEG 4000 was used as a marker of water absorption.

	Normal rats		Diarrheic rats	
	WHO-ORS	WHO-ORS/gln	WHO-ORS	WHO-ORS/gln
n	8	8	9	9
Sodium	44 ± 24*	153 ± 41*	36 ± 31*	98 ± 38*
Water	71 ± 33*	134 ± 33*	22 ± 27*	64 ± 37*
Potassium	30 ± 8 *	58 ± 19*	22 ± 11	30 ± 7 +
Bicarbonate	157 ± 58	131 ± 41	148 ± 105	105 ± 67
Glucose	180 ± 82	205 ± 54	123 ± 79	183 ± 70
Glutamine	—	93 ± 17	—	73 ± 34

* p<0.05 WHO-ORS vs WHO-ORS/gln + p<0.05 Normal vs Diarr.

Diarrhea affects net Na and water absorption. Glutamine significantly increases (300%) Na absorption in normal and in diarrheic animals.

3

VALIDATION OF A STATISTICAL PREDICTOR OF MORBIDITY IN CHILDREN OF THE LOW SOCIOECONOMIC STRATUM OF SANTIAGO. M.Araya, J.Espinoza, O.Brunser, I.Pacheco. INTA, University of Chile, Santiago, Chile.

Statistical "predictor" can be used in health problems to identify high risk groups. We previously defined a predictor to detect children at risk of developing high morbidity rates, specially persistent diarrhea. To validate this predictor questionnaires were applied to 720 families living in the same area where the instrument was obtained and who had an infant. Sixty one cases who fulfilled the requirements were identified (Group 1) and followed up for two months by means of weekly home visits. Data obtained were compared with those from an unselected sample with similar characteristics, living in the same area, surveyed for a previous study (Group 2). Expressed per 100 children per month the total number of episodes of illnesses, of diarrhea and of respiratory infectious were 158, 30.6 and 122.4 in Group 1 and 39.6 and 31.6 in Group 2, respectively (p<0.01, p<0.01, p<0.01). Children in Group 1 had symptoms during 50.1% of the observation period compared to 13.6% for Group 2. These preliminary results show that the predictor selected a group of infants with high morbidity rates. The ongoing investigation must await its completion to evaluate the predictor with regards to persistent diarrhea.

Partially financed by FONDECYT 89-0922.

4

EFFECT OF FORMULA CARBOHYDRATE (CHO) CONCENTRATION ON TOLERANCE AND NUTRIENT ABSORPTION IN INFANTS WITH SEVERE, CHRONIC DIARRHEA. C.Lifschitz, F.Carranza, A.Cordano. Child Nutr Res Ctr, Baylor Coll Med, Houston, Texas; Inst da Criança, S Paulo, Brazil and Bristol Myers, Evansville, IN.

The role that the amount of dietary CHO has on formula tolerance and macronutrient absorption in 12 malnourished, lactose- and soy-intolerance infants <1 yr of age, admitted for severe, chronic diarrhea to Cotocho Hospital, S.Paulo, Brazil, was investigated. Infants underwent 2 successive 72-hr metabolic balances in a crossover design, during which they received in random order one of 2 formulas which had almost identical composition except for CHO and fat content. Breath samples were collected during each dietary period for H₂ determination. Fecal fat, osmolality, nitrogen, and energy were determined. Results were analyzed by paired t test. There were no significant differences between the two feeding periods in weight gain, fecal nitrogen, peak breath H₂ levels, and fecal osmolality. Tolerance to the low CHO formula was better than to the high CHO formula, as indicated by a significantly lower stool output ($\bar{x}$ ± SE 387 ± 66 g vs 764 ± 128, respectively, p<0.05), higher fecal pH (p<0.05), and less fecal CHO (p<0.05). Macronutrient absorption was also better with the low CHO formula as indicated by the significantly lower amount of total fecal calories from lower CHO excretion (p<0.05) and better absorption of fat (p<0.001). A significant correlation existed between CHO-derived energy in feces and stool output (p<0.05). CHO content in formula has an overriding effect on tolerance and macronutrient absorption in infants with severe, chronic diarrhea.