

- 5 CORTICAL AND MEDULAR ADRENAL GLAND RESPONSE TO HYPOXEMIA (H) IN FETAL LLAMA. Riquelme, R.; Baravides, C.; Espinoza, M.; Cabello, G.; Lara, H.; Serón-Ferre, M.; Llanos, A. Depto. Preclínica, Div. Ciencias Médicas Oriente, Fac. Med., Depto. Bioquímica Y Biología Molecular Fac. Cs. Químicas y Farm., U. de Chile. Depto. Cs. Fisiológicas, Fac. Cs. Biológicas, U. Católica de Chile.

The cardiovascular response to H in fetal llama (Lama glama) is characterized by an intense vasoconstriction of the carotids, kidneys and gut. In fetal sheep this response is partially mediated by catecholamines and arginine-vasopressin. A simultaneous increase in plasma ACTH and cortisol (F) is also observed. Since the llama has evolved at 4000 meters above the sea level in a low O<sub>2</sub> environment, we investigated whether noradrenaline (NA) and F plasma concentrations increase after an acute episode of H at sea level in fetal llama. Catheters were placed into fetal and maternal femoral arteries and veins in 5 pregnant llamas in the last third of gestation, 7 days after their arrival to Santiago (586 m) from Parícuta (4600 m). Hypoxemia was induced by making the mother breathe a mixture of N<sub>2</sub> and air (fetal % Sat Hb decreased from 46.6±5.7 to 28.6 ± 1.7%). Plasma concentrations of F (RIA) and NA (fluorimetry) were measured in basal and H (10min) conditions. NA increased from 2.3±1.4 to 42.2±14.0 ng/ml (mean ± SEM) during H. Basal F was 23.8 ± 24.9 ± 9.9 ng/ml during H. The results show a medullar but not a cortical response to an acute H in the fetal llama in the last third of gestation. The medulla responded with a 1800% increase in NA plasma concentrations during H. This result could explain the intense vasoconstriction observed during H in the fetal llama. The failure of F to increase during H could be due to an insufficient fetal H, immature F synthetic pathway, refractoriness of the fetal adrenal cortex to ACTH or the presence of a factor inhibiting the ACTH trophic action on the fetal adrenal gland.

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- 6 THERMOGENIC EFFECT OF FEEDING IN NORMAL NEONATES. Cardoso, A.L.; Saraiva, P.A.P. Hospital das Clínicas da Fac. de Med. Universidade de São Paulo, Brasil.

The basal metabolism and the specific dynamic action (SDA) of milk were determined in a group of 34 normal neonates, appropriate for gestational age, in a closed-circuit metabolism chamber. The determinations of VO<sub>2</sub>, VCO<sub>2</sub>, RQ and REE (resting energy expenditure) were obtained at various 30 min periods through the feeding intervals (180 min) the initial one at 30 minutes before feeding (BF) and thenceforth for 150 minutes post feeding (PF). Results were expressed in Kg body weight and body surface area. The values obtained at BF were considered baseline. BF and PF values of VCO<sub>2</sub>/m<sup>2</sup> were different (p < 0.05). SDA assessed by VO<sub>2</sub>, VCO<sub>2</sub> and REE all together discriminated BF and 0/30 min PF, regardless of the referential values. In the neonates who received breast milk it was not possible to detect SDA.

- 7 DENDRITIC DEVELOPMENT IN THE NEOCORTEX OF EARLY MALNOURISHED INFANTS. Cordeiro, M.E.; Trejo, M.; Garcia, E.; Benveniste, S.; Prado, R.; Colombo, M. Dept. of Basic Sciences, Dept. of Pediatrics, South Division, Dept. of Anatomy, Faculty of Medicine and Institute of Nutrition and Food Technology, University of Chile.

It has been demonstrated that the most vulnerable period for the central nervous system is that of the 'brain growth spurt'. In man, this process occurs mainly during the first 24 months after birth. Within this period the brain can be affected by different noxas, among them, protein and calorie malnutrition (PCM). In this work we have studied the dendritic basilar arborization reached by pyramidal cells of the Vth cortical layer of the motor cortex of mild, moderate and severe PCM infants and in well-nourished, using the Golgi-Cox method and morphometry. The merasemic children (mild, moderate and severe) showed a significant reduction of the basal dendritic arborization; severe PCM being the most affected of all. It is postulated that PCM during the first months of life induces a reduced branching pattern of the basal dendrites, that could be one of the underlying causes of an abnormal cerebral function.

- 8 PHENOBARBITAL: RELATIONSHIP WITH NUTRITIONAL STATUS AND BIOCHEMICAL PARAMETERS. Salazar, T.; Novoa, F.; Peñaloza, L.; Capurro, M.T.; Troncoso, L. Centro de Investigaciones Materno Infantil, Hospital Paula Jaraquemada, Fac. de Medicina, Universidad de Chile, Chile.

The literature shows that most of the antiepileptic drugs may produce adverse effects on treated patients. Previously we have demonstrated that plasmatic albumin (A) levels, phosphate (P) levels and alkaline phosphatase (AP) activity in children with phenobarbital (PB) treatment were significantly different compared to the control group (p < 0.005, p < 0.005 y p < 0.001, respectively). The purpose of this investigation is to study the use of PB in a group of patients and correlate the total and free fractions of this drug with their nutritional status and biochemical parameters. Our results show that in the wellnourished patients receiving PB, levels of serum A are reduced in 24,1% of them (x̄ = 3,9g/dl ± 0.34), and the levels of plasmatic P were also reduced in 20,7% of them (x̄ = 4,4mg/dl ± 0.56). Moreover, in the same group, AP activity increased in 44,8% (x̄ = 510 U/L ± 134), and the glutamic oxaloacetic transaminase (GOT) activity increased in 32,1% (x̄ = 19,6 U/L ± 4.3) of the patients. In those with severe malnutrition, the % of them that showed low levels of plasmatic A increased to 42,8% (x̄ = 3,7 ± 0.56) and the P levels to 46,2% (x̄ = 3,9 ± 0.79). A significant difference of P levels was found between both groups (p < 0.005), but the levels of GOT and A were not different. These results indicate that the free fraction of PB does not vary with changes in the nutritional status and strongly suggest that, besides the monitoring of the drug, the necessity of measuring some biochemical parameters for a better clinical control of the patient.

- 9 BODY COMPOSITION AND NUTRITIONAL STATUS OF CHILEAN MALE ADOLESCENTS ACCORDING TO SEXUAL DEVELOPMENT. Barrera, G.; Gattas, V.; Riumalló, J. INTA, U. de Chile, Chile.

Body composition and nutritional status were determined in a sample of 147 male adolescents. The sample was stratified by degree of maturation of external genitalia (GMGE) following Tanner procedures. Biochemical indicators were obtained for the study of nutritional status. Most subjects belonged to medium or low-medium socioeconomic level. Maximal growth rate both in Ht and Wt was observed between GMGE 2 and 3 on the basis of a tissue containing 96% of LBM and 4% of fat. Between GMGE 1 and 2 growth rate is only 1/5 of that observed between GMGE 2 and 3. Tissue composition was 71% LBM and 29% fat. Between GMGE 3 and 5 growth is also slower with 80% LBM and 20% fat. Deficit in the W/A ratio was observed in 47% of the subjects in the whole sample and in 54% of those subjects in GMGE=5. The W/H ratio was below 90% of the NCHS standard in 7% of the subjects. A W/H ratio over 110% was found in 34% of subjects with GMGE=1. 9% of those with GMGE=5 had a W/H below 90%. Deficit in the H/A ratio was found in 32% of the subjects. Biochemical indicators of nutritional status were within normal limits, in all groups. Hemoglobin and Hematocrit levels increased significantly with each GMGE. Positive and significant correlation (p < 0.001) with R values greater than 0.8 were found between body fatness, tricipital skinfold and % arm fat, as well as R values ranging between 0.6 and 0.7, between 0.6 and 0.7, between % body fat and W/A, W/H and W/H<sup>2</sup>. The different index of body fatness were significantly correlated with triglyceride levels while height and LBM correlate significantly with hemoglobin level.

- 10 MAXIMAL PHYSICAL CAPACITY (VO<sub>2</sub>Max) IN CHILEAN MALE ADOLESCENT ACCORDING TO SEXUAL MATURATION (GMGE), BODY COMPOSITION, NUTRITIONAL SITUATION AND PHYSICAL ACTIVITY LEVEL. Riumalló, J.A.; Barrera, G.; Gattas, V. INTA Universidad de Chile, Chile.

A continuous treadmill test with four consecutive work loads was employed to estimate VO<sub>2</sub>Max. in a sample of 147 male adolescents of medium to low socioeconomic level. The sample was stratified according to the degree of maturation of external genitalia (GMGE) according Tanner's Standards. VO<sub>2</sub>Max. (l/min) increased progressively and significantly from 1.6±0.3 l/min for subjects with GMGE=1 to 2.8±0.5 l/min for those with GMGE=5. Average VO<sub>2</sub>Max was 46±7 ml/kg/min and 55±8 ml/Kg LBM/min respectively, without variations with GMGE. Positive correlations (R > 0.8; p < 0.001) were found between VO<sub>2</sub>Max (l/min) and Wt, Ht, Wt/H<sup>2</sup>; LBM and leg circumference. Also positive and significant correlations with R values between 0.7 and 0.8 were found for thigh circumference, lean arm area. Correlations also significant with R values between 0.3 and 0.6 were found for total energy expenditure, plasma copper and hemoglobin levels, mean corpuscular volume and for dietary intake of B vitamins and iron. VO<sub>2</sub>Max in ml/kg LBM/min ranges between 30 and 80 ml; although subjects in first quartile for this parameter do not differ at all in body size and composition with those in the fourth quartile. The only difference between the two groups was the cardiac rate during the three last work loads in the treadmill test which were significantly higher for subjects in the first quartile for VO<sub>2</sub>Max (ml/kg LBM/min). This can be attributed to genetic endowment or a higher physical activity level, although the latter (obtained from daily record of activities) did not correlate with VO<sub>2</sub>Max.