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1 LACK OF RESPONSE OF BRAIN AND ADRENAL BLOOD FLOW TO HYPOXEMIA IN THE FETAL LLAMA. R.Riquelme, C.Gaete, F.Garay, J.Carrasco, M.Espinoza, G.Cabello,M.Serón Ferré, JT.Parer, JA.Llanos. Dep.Pre.Fac.Medic.Dep.Bioq-B.Mol, Fac.Cs.Quim-Farm., U.de Chile, Dep.Biol, U.Tarapacá, Dep.Cs.Fisiol. UC. de Ch, Ob&Gyn, U. Calif, USA.

The fetus of sheep a species that evolved in lowlands, responds to hypoxemia (H) by maintaining cardiac output and umbilical-blood flow, increasing heart, brain and adrenal blood flow and decreasing it to other organs. The response to H of the fetus of the llama, that has evolved in high altitudes, is not fully understood. We postulate that the systemic responses to H in the fetal llama are less marked and that the main adaptation occurs at the cellular and tissue levels. Our aim was to compare cardiac output and its distribution at 0 min (B) and after 20 min of fetal H (22-27% Sathb and 3-6 ml02/dl in descending aorta) in 8 fetal sheep and 8 fetal llamas at 0.8 gestation. The results ($\bar{x}$ + SEM) were:

		Fetal Llama		Fetal Sheep	
		Basal	Hypoxemia	Basal	Hypoxemia
Cardiac output	(ml/minxkg)	145±31	116±22	461±20 ▲	443±16 •
Umbilical flow	(ml/minxkg)	57±9	49±9	199±10 ▲	221±6 •
Heart	(ml/minx100g)	92±19	258±38*	185±15 ▲	823±42*•
Brain	"	54±12	58±15	158±11 ▲	296±27*•
Adrenals	"	392±113	352±71	217±17	740±10*•
Gut	"	14±5	7±2	45±4 ▲	26±4 *•
Kidneys	"	94±24	14±6*	166±12 ▲	88±14*•
Carcass	"	6±2	3±0.8	22±2 ▲	11±1 *•

*$p<0.05$ B vs H; ▲$p<0.05$ B Llama vs B Sheep; •$p<0.05$ H llama vs H Sheep

Under basal and hypoxemic conditions fetal llamas have lower blood flows than fetal sheep. Moreover, there is no change in brain and adrenal blood flows during hypoxemia. These results suggest that one of the main adaptations to hypoxemia in fetal llamas is an increase in cellular oxygen extraction. Grant Fondecyt 89-1080.

2 HYPOTHALAMIC-PITUITARY DYSFUNCTION IN PREPUBERTAL PATIENTS AFTER RENAL TRANSPLANTATION. J. Ferraris, P. Fainstein-Day, RA.Gutman, E.Granillo, J,Ramírez, S. Ruiz, Pasqualini T. Pediatría, Hospital Italiano, Buenos Aires, Argentina.

Linear growth failure is frequent after renal transplantation (Tx). The hypothalamic-pitiutary-somatotrophic and thyrotropic axis was evaluated in 16 prepubertal children (9 boys) aged 8.8-17.3 years ($\bar{x}$= 12.0), 1.1 to 6.5 years ($\bar{x}$= 3.5) post-Tx. Immunosuppressive treatment included azathioprine, ciclosporine A and methylprednisone 0.2mg/kg/day. Serum creatinine was 0.7-2.0 mg/dl ($\bar{x}$= 1.3); it was ≤1.0mg/dl in 7. Height standard deviation score (SDS) was -2.8 ± 0.3 ($\bar{x}$ ± SE), growth velocity was 2.0 ± 0.3 cm/year. Mean nocturnal growth hormone ($\bar{x}$GH) was 3.8 ± 0.8ng/ml; in 3 patients it was <1ng/ml. GH response to arginine and clonidine was 8ng/ml in 5 of 16 and in 7 of 12 patients, respectively; 2 patients had deficient responses in both tests. IGF-1 levels ($\bar{x}$= 1.5 ± 0.1 U/ml) were above the mean normal value in all patients. Correlation between $\bar{x}$GH and height was r: 0.5, $p<0.02$. Mean total T3 (1.7 ± 0.2ng/dl) and total T4 (9.9 ± 0.5ug/dl) were normal. Free T4 levels ($\bar{x}$= 1.1 ± 0.1ng/dl) were low in 3 of 8 patients. In 13 patients mean basal TSH value was normal (3.7 ± 0.3uU/ml) with deficient TSH response to TRH -IN 7 and delayed TSH response in 3. Height was low after Tx, even when renal function was normal. The alterations in GH and thyroid hormone secretion suggest hypothalamic-pituitary dysfunction. High or normal IGF-1 levels suggest IGF-1 resistance.

3 IDIOPATIC FETAL GROWTH RETARDATION AND PREECLAMPSIA: A COMMON MECHANISM? S.P.Salas, P.Rosso, y F.González. Centro de Investigaciones Médicas, Universidad Católica, y Hospital Sótero del Río, Santiago, Chile.

It has been postulated that both idiopatic fetal growth retardation (FGR) and FGR associated with pre-eclampsia (PE) share common pathophysiologic alterations (Wallenburg, 1988). The aim of this study was to investigate the cause of FGR in both diseases. We determined plasma volume (PV), plasma renin activity (PRA), aldosterone (ALDO), estradiol (E2) and progesterone (Prog) levels in 30 normotensive (NT) and 12 PE (Am College Obstet Gynecol Criteria) nulliparous women with FGR between 32-38 wks of gestation. Mean blood pressure (NT=82±1.4; PE=107±2.4 mmHg; $p<0.001$) and maternal weight (NT= 63±1.2; PE= 69±2.5 kg; $p<0.02$) were higher in PE group; no differences were observed in heart rate, hematocrit and creatinine clearance. PV was similar and significantly lower in both groups when compared with PV levels of control pregnant women (NT=2976±76; PE=2795±111ml). PE group had lower PRA (NT=10.6±1.4; PE=5.5±1.3 ng/ml/h; $p<0.05$); however, no differences were observed in Aldo (NT=414±46.7; PE=318±92 pg/ml). Prog was significantly higher in PE group NT=159±10.5; PE=243±33 ng/ml; $p<0.01$), whereas Aldo/Prog ratio was lower NT=2.9±0.4; PE=1.4±0.3; $p<0.03$). E2 levels were similar in both groups NT=19.7±1.8; PE=17.5±2.2 ng/ml). Gestational age at delivery was higher in NT mothers NT=38±0.3; PE=36±0.6 sem; $p<0.01$; this may explain the observed differences in newborn weight NT=2477±66; PE=2089±152 g;$p<0.01$). Newborn of PE mothers had significantly lower ponderal index (NT=2.4±0.05; PE=2.2±0.04; $p<0.03$). These data indicate that could be the reduction in maternal plasma the inmediate cause of both idiopatic FGR and of FGR associated to PE volume. However, the differences observed in PRA, Prog and Aldo/Prog ratio between both groups suggest that the mechanisms of inadequate plasma volume expansion may be different. Partially supported by FONDECYT 91-0734.

4 ONTOGENY OF THE RED CELL CHARACTERISTICS IN THE LLAMA FETUS. E.Sanhueza, M.E.Lathrop, C.Rabasa, C.Gaete, R.Riquelme, M.Zagolín, A.J.Llanos. Universidad de Chile: Fac.Medicina, Depto.Cs.Preclínicas; Fac.de Cs.Quim. y Farmacéuticas, Depto.Bioquímica y Biología Molecular. Chile.

Although the species has evolved at high altitudes, adult llamas have low hematocrits (small red cells plus a high number of erythrocytes). Hemaglobin concentrations, are similar to species that have evolved in lowlands. Preliminary data obtained from llama fetuses show a P50 lower than the human. Since there is no information regarding red cells characteristics during intrauterine life in llamas we studied red blood cell counts per mm , hematocrit, hemoglobin concentration, mean corpuscular volume (MCV), mean corpuscular hemoglobin (MCH) and mean corpuscular hemoglobin concentration (MCHC) in arterial samples of 25 pregnant llamas and their fetuses (purchased in Parinacota, 4400m above sea level), in the last half of gestation.

The results were: $\bar{X}$ ± SEM, $p<0.05$ (*:vs I, #:II vs III and &: Mother vs $\bar{X}$ of fetuses, ANOVA and Newman Keuls test).

	Fetuses I	Fetuses II	Fetuses III	Mothers
n	9	11	5	25
Fetal weight (kg)	1.96 ± 0.22	4.34 ± 0.30*	7.11 ± 0.43*#	
Erythrocytes ($10^6/mm^3$)	12.7 ± 0.7	14.6 ± 0.6 *	18.1 ± 0.6 *#	12.4 ± 0.5&
Hematocrit (%)	31.8 ± 1.8	30.0 ± 0.9	30.8 ± 1.4	27.1 ± 0.8&
Hemoglobin (g/dl)	14.8 ± 0.9	14.2 ± 0.6	14.6 ± 0.8	12.3 ± 0.4&
MCV (fl)	24.0 ± 0.9	20.9 ± 0.9 *	17.1 ± 1.0 *#	21.3 ± 0.4
MHC (ug)	11.3 ± 0.5	9.9 ± 0.4 *	8.1 ± 0.6 *#	10.1 ± 0.3
MCHC (g/dl)	47.7 ± 2.6	47.5 ± 1.6	47.7 ± 2.6	46.4 ± 1.3

These red blood cell characteristics (high numbers of small sizes, high hemoglobin concentrations) may allow optimal blood flow and increased oxygen availability and extraction by the tissues in hypoxia. (Grant Fondecyt # 89-1080 - Chile).