1369 BARBITURATE ANAESTHESIA REDUCES THE INCIDENCE OF INTRAVENTRICULAR HEMORRHAGE (IVH) IN THE BEAGLE PUPPY. David M. Coulter, Timothy R. LaPine, W. Manford Gooch, III, Dept of Peds, Univ of Utah, Primary Children's Medical Center, Salt Lake City, Utah

We induced IVH in beagle puppies with a hypotensive, hypovolemic insult followed by rapid volume replacement. We withdrew sufficient blood to drop mean arterial pressure by 50%, waited 5 minutes, and then rapidly re-infused the blood. We used two different anaesthetic regimens: local anaesthesia for cutdowns followed by general anaesthesia with methohexitol or local anaesthesia followed by pancuronium. We performed gross and histologic examination of the fixed brains. Both groups of pups experienced identical BP responses to tracheostomy, hemorrhage, and re-infusion of blood. However, the incidence of grossly visible IVH differed significantly.

Anaesthetic	# of animals	IVH	
Barbiturate	40	0	
Local	30	7	p<.01

In this model hemorrhage is probably caused during reinfusion of blood by the rapid rise in BP to levels above baseline. The risk may be increased by tissue hypoxia during the hypotensive insult. Barbiturates reduce O_2 consumption. It may be this effect that prevented IVH in the treated animals. Researchers planning to investigate the pathophysiology of IVH should be warned that the choice of anaesthetic/analgesic medications dramatically affects the incidence of IVH in the beagle puppy.

(Spon. by G. Chan)
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1370 LYSIS OF AORTIC THROMBUS WITH STREPTOKINASE M.Curtis-Cohen, H.Chawla, M. Keller, Depts. of Pediatrics and Radiology, Hahnemann University, Philadelphia, Pa. (Spon. by B. Falkner).

D.W. was a 2.6kg term male with perinatal asphyxia due to an initial hemoglobin of 2.5gm/dl. An umbilical arterial catheter(UAC) was placed. At age 5 days the left leg was pale and pulseless. An aortic ultrasound showed the UAC tip lcm above the bifurcation with a saddle thrombus in the lumen. Contrast material injected through the UAC demonstrated total occlusion of the left common iliac and partial occlusion of the right. In attempt to lyse the thrombus, 2500u of Streptokinase was infused through the UAC over 1 hour followed by 1000u per hr. After 12 hours there was some clinical improvement and after 18 hrs. a repeat aortogram showed patency of both common iliac arteries. The UAC was pulled and Streptokinase discontinued. 240u of intravenous heparin was given every 4 hrs. for 24 hrs., then changed to continuous low dose infusion. No bleeding complications occurred. Follow up aortic ultrasound showed a small amount of clot at the bifurcation. 6 days later both legs had palpable pulses and equal perfusion. Digital subtraction angiography revealed normal branching of the aortic bifurcation, and symmetric runoff into the ileo-femoral system with no abnormal collaterals.

Streptokinase infusion appeared to hasten thrombus dissolution in this infant.

●1371 NEONATAL LUNG DEFENSES AFTER SURFACTANT THERAPY. John B. D'Ambola and Michael P. Sherman (Spon. by Cynthia T. Barrett) UCLA Medical Center, Department of Pediatrics, Los Angeles.

Artificial surfactant has been used to treat Hyaline Membrane Disease (HMD), but its effect on phagocytic function in the neonatal lung is poorly defined. A mixture of 70% phosphatidylcholine/30% phosphatidylglycerol w/w was diluted in sterile phosphate-buffered saline (PBS) and sonicated. Either 4 mg/Kg of this mixture or an equal volume (100 µl) of PBS was instilled into the surgically exposed trachea of less than 12 hr old rabbits. One hr after instillation, in vivo bacterial clearance was studied by exposing the groups to a Streptococcus agalactiae type Ia (GBS) aerosol and the numbers of viable GBS compared in the left lung at 0 and 4 hrs after infection. Results follow:

Treatment	GBS at 0 Hr (n)*	GBS at 4 Hr (n)	% Clearance
Surfactant	331±46 (22)	268±32 (22)	19.0
PBS	303±43 (21)	166±34 (23)	45.3
NONE	643±58 (28)	292±46 (27)	54.6

*-mean±SEM x 10^{-4}CFU/left lung (n = # animals tested)

Intrapulmonary killing of GBS was significantly lower in surfactant vs control ($p<0.05$). Additional litters were divided and treated with either surfactant or PBS, and alveolar macrophages (AM) recovered 1 hr later by lavage. Phagocytosis was ascertained using FITC-labeled GBS opsonized in newborn rabbit serum (50 GBS:AM) by a fluorescence quenching method. The percentage of phagocytic AM ($\bar{x}$ = 91.4 vs 93.0) and GBS/phagocytic AM ($\bar{x}$ = 16.9 vs 18.6) were similar in surfactant vs PBS animals. Surfactant therapy may impair bacterial killing by newborn AM.

1372 CARDIO-RESPIRATORY DEPRESSION AND PLASMA BETA ENDORPHIN LEVELS IN LOW BIRTH WEIGHT INFANTS DURING THE FIRST DAY OF LIFE. Shmuel Davidson, Irit Gil-Ad, Hana Rogovin, Zvi Laron and Salomon H. Reisner (Spon. by Carmi Margolin) Tel-Aviv University Sackler School of Medicine, Neonatal Department and the Institute of Pediatric Endocrinology Beilinson Medical Center, Tel-Aviv, Israel.

29 premature infants(PI)were studied to determine whether neonatal asphyxia, apnea and low blood pressure in the first day of life are associated with elevated plasma B Endorphin(B-EP) concentrations.13 non-asphyxiated full-term infants(FTI) served as controls. Plasma B-EP concentrations were determined at 0.5-2 (B-EP1), 4-6(B-EP2) and 18-24(B-EP3) hours of life using a radio-immunoassay method. Results(mean±SEM) were expressed in pmol/L. PI with moderate or severe asphyxia(19) had higher B-EP1(32.1±6.7vs. 16.4±7.4, p=0.05) and significantly higher B-EP2 plasma levels(50.4±10.0vs. 22.9±9.2, $p<0.04$) compared to the 10 non-asphyxiated PI. A significant elevation in B-EP1(39.4±9.9vs. 17.7.±4.4, $p<0.04$) and B-EP2(59.3±13.8vs. 27.1±7.1, $p<0.04$) concentrations was observed in PI with low blood pressure(12) who required the administration of volume expanders. No differences were observed in PI with and without apnea. Comparing the PI and the FTI groups, no differences were found between B-EP1 and B-EP3. Although a significant elevation in B-EP2 concentration was found in PI(40.2±7.5vs. 12.7±1.8, $p<0.025$),in PI without asphyxia and with normal blood pressure there was no difference from the FTI. It may be speculated that the increased endogenous release of B-EP in PI with asphyxia and low blood pressure is causally related.

1373 THEOPHYLLINE TREATMENT DOES NOT INCREASE THE RISK OF NECROTIZING ENTEROCOLITIS IN PRETERM INFANTS. Jonathan M. Davis, Soraya Abbasi, Lois Johnson, Mary Grous, Chari Otis. Univ. of Pa. Sch. of Med., Pennsylvania Hosp., Section on Newborn Pediatrics, Philadelphia.

Anecdotal case reports and animal studies (using intraperitoneal theophylline [T] at high doses) have suggested that T therapy may damage gut mucosa and increase the risk of NEC. Therefore, in order to investigate the role of T in the pathogenesis of NEC, 275 infants <1500g were prospectively studied over a three year period. 135 infants (49%) received T (maintaining a serum concentration of 8-12 mg/l) for treatment of apnea of prematurity, bronchopulmonary dysplasia or to assist in weaning from mechanical ventilation. The overall incidence of NEC was 10% (28 cases). The table below demonstrates that 12/135 (9%) of infants treated with T and 16/140 (11%) of untreated infants developed NEC.

	T	No T	Total
NEC	12	16	28
No NEC	123	124	247
	135	140	275

The mean ± SD age of onset of NEC was 18±17 days in T treated infants and 19±13 days in untreated infants. Only 3% (4/135) of T treated infants developed NEC within 1 week of starting therapy. Chi square analysis revealed no differences between the 2 groups (P>.1). Multifactorial analysis of risk factors among the 28 infants with NEC revealed no differences between treatment groups. The data suggest that treatment of premature infants with T does not increase their risk for developing NEC.

=1374 CARBON MONOXIDE EFFECT ON BRAIN OXIDATIVE METABOLISM IN NEWBORN PIGLETS. Maria Delivoria-Papadopoulos, L. Craig Wagerle, Jan M. Goplerud, Donald P. Younkin, John Maris, Britton Chance. Univ. of PA., Depts. of Physiol, Neurol., Biochem and Biophysics, Phila., PA.

The effect of carbon monoxide on brain oxidative metabolism was studied in 5 anesthetized newborn piglets during mechanical ventilation, at normoxic and normocarbic steady-state. Surface coil 31-Phosphorus (31-P) spectra (ATP, phosphocreatine (PCr), inorganic phosphoate (Pi), phosphomonoesters, and phosphodiesters), measured by NMR, were obtained every 4 min over a period of 2 hrs with a gradual increase of blood carboxyhemoglobin [COHb] . Measurements of blood gases, acid-base, and regional CBF were obtained at baseline, 30-40%, 50-60%, and 70-80% of blood [COHb] level, respectively. PCr/Pi decreased in all piglets from a mean of 1.65 to 0.5 in a linear relationship as a function of the gradual increase in [COHb] from 6.3 to 80.3%. CBF increased from 78 ml/min/100g to 172 to 220 parallel to increasing levels of [COHb] in all piglets. Oxygen delivery remained relatively unchanged from 466 umol/min/100g to 416 to 391, and decreased at [COHb] of 70-80% to 287 umol/min/100g. In contrast to previous data in our laboratory where PCr/Pi abruptly decreased when oxygen content reached 4%, PCr/Pi in the present studies remained relatively high for comparable decreased O_2 content due to hypercarboxyhemoglobinemia, because blood flow remained relatively high in the presence of decreased oxygen content, whereas in hypoxic hypoxia flow was decreased at extreme hypoxemia. These data suggest that cerebral perfusion is better maintained in carbon monoxide than hypoxic hypoxia, possibly reflecting altered responsivity of brain vessels or adrenergic mechanisms capable of altering CBF as seen in hypoxic hypoxia.