1541 CONJUGATED HYPERBILIRUBINEMIA (CH): A PREDICTOR OF PERINATAL MORTALITY & POOR NEUROLOGIC OUTCOME.

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Thirty-six of 1236 high-risk newborns transported to NSUH between 1/73 and 12/82 developed CH (direct bilirubin >2.0 mg/dl or >50% of total); 36 transports matched for sex, race, gest. age ± 2 wk, weight ± 200 gm, birthdate ± 1 yr, served as controls. All charts were reviewed to determine association between CH and various factors.

	# Study Pts	# Controls	P-Value*
Perinatal Asphyxia	6	5	NS
Shock	14	2	<0.05
C.H.F.	7	2	NS
Hemolytic Disorders	15	1	<0.01
Multiple T_X (>4 T_X)	18	4	<0.02
Exchange T_X	13	3	<0.05
T.P.N.	8	8	NS
Infections	13	5	NS
Mortality	19	3	<0.01
Poor Neuro. Outcome	9/17	1/33	<0.02

*Chi square with Yates correction

These results indicate that CH is significantly associated with shock, hemolytic disorders, multiple T_X, exchange T_X, higher mortality and subsequent poor neurologic outcome. T.P.N. was not significantly associated with CH. The outlook for survival and normal development for the neonate with CH is poorer than has been previously recognized.

†1542 IN VIVO EFFECT OF FREE FATTY ACIDS (FFA) ON BILIRUBIN (BR) BINDING.

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In healthy adults a wide range (0.28 to 5.34mMol/L) of plasma FFA levels were generated by the fat meal-heparin regimen (Schalch DS, Kipnis DM, J.Clin.Invest.44:2010,1965). In each experiment 4-5 blood samples were collected, albumin (Alb) and FFA concentrations were measured and BR binding assessed using: (a) BR titration of sera using Sephadex (S) Column Chromatography (Valaes T, Hyte M, Pediatrics 59:881,1977); (b) the Undiluted Peroxidase (P) method (Ahlfors CE, Clin.Chem.27:692,1981); and (c) the automated Bilirubin Hematofluorometer (HMF) (Wells R et al Clin.Chem.28:432,1982). With S a significant negative correlation was found between the BR/Alb (molar ratio) at the BR titration point ("BR binding capacity") and the FFA/Alb ($Y=0.883-0.088 \cdot X$, $r=-0.90$, $p<0.001$, $n=38$). Similarly, after "spicing" the sera to BR/Alb of 0.367±0.029(SD) the Apparent Unbound BR (nMol/L) by the P method was significantly related to the FFA/Alb ($Y=13.5+41.66 \cdot X$, $r=0.957$, $p<0.001$, $n=28$). The BR/Alb at BR binding capacity by HMF was only weakly related to FFA/Alb ($Y=0.711-0.009 \cdot X$, $r=-0.353$, $p<0.05$, $n=34$). However, "spicing" of the blood samples to BR/Alb of 0.54±0.054(SD) improved the correlation ($Y=0.929-0.041 \cdot X$, $r=-0.835$, $p<0.001$, $n=12$). The reasons for this effect of "spicing" are not clear.

Previous conclusions of no effect up to FFA/Alb of 4, derived from studies with Alb solutions and in vitro additions of FFA, should be revised.

†1543 CRITICAL SERUM CA FOR CARDIAC FUNCTION: ECHOCARDIOGRAPHIC CORRELATIONS, STUDIES IN IONIZED CA (iCa), EFFECT OF THERAPY IN PROFOUND EARLY NEONATAL HYPOCALCEMIA (HC).

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Traditionally, in infants, serum Ca < 7.0 mg/dl is considered to impair cardiac function, while in adults cardiac function is unimpaired with iCa of 2.4 mg/dl. In VLBW infants, we studied the thesis that decline in serum Ca to 6.0 mg/dl: 1) would not impair cardiac function, 2) iCa would be > 3.0 mg/dl, and 3) evaluated effect of Ca infusion on cardiac function. 13 normokalemic, normonatremic AGA infants, birth wt 998 ± 198 gms (mean ±s.d.) gestation < 32 wks were studied. When serum Ca< 6.0 mg/dl, 18 mg/kg of Ca as 10% Ca gluconate was infused over 10 min. Serum Ca, iCa, Mg, P, EKG and M mode echo were obtained on entry (10 ± 2 h), when HC (46 ±9 h), immediately post Ca, and +8 hrs post Ca. In all infants, serum Ca declined to <7.0 and in 7 to < 6.0 mg/dl, Mg and P did not change. In profound HC (mean ±s.e.):

* (p <0.025)	Baseline	Pre Ca	Post Ca	+ 8 Hrs
Serum Ca mg/dl	7.9±0.7	5.1±0.2*	9.2±0.7	7.1±0.3
Serum iCa mg/dl	4.9±0.3	3.8±0.2*	6.8±0.4	4.2±0.2
Heart rate/min	152±4	155±5	157±3	161±3
Systolic BP mmHg	44±3	49±3	51±4	47±4
LVSTI	.30±.02	.31±.02	.27±.02	.31±.01
RVSTI	.35±.02	.30±.03	.29±.03	.29±.02
Fiber shortening %	33±1.5	35.4±2	34.4±1.8	35±2
VcF circ/s	2.15±0.16	2.15±0.16	2.2 ±0.19	2.39±0.32

In VLBW infants, serum Ca low as 5.0 mg/dl 1) does not impair cardiac function, 2) iCa is > 3.0 mg/dl, 3) Ca inf. does not alter cardiac function.

1544 NEONATAL RISKS OF A GROUP OF SGA INFANTS.

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A preceeding study demonstrated an important difference between Lubchenco's intrauterine growth curve, and a curve designed by us from normal chilean newborns. A significant increase in the number of SGA infants resulted from the use of our curve.

The purpose of this study is to determine, if this additional group of SGA infants, has higher neonatal risks than the AGA infants. Both curves were applied to 9537 consecutive live births older than 35 weeks of gestation occurred in our Hospital between Jan.1/78 and Dec.31/82. Data obtained from the comparison of the two curves were as follows:

	LGA	AGA	SGA
Lubchenco	17%	80%	2% (192)
Our curve	9,5%	79,5%	11% (1024)

Mortality, hospitalization and low Apgar score(<4) of the additional 842(9%) SGA infants were determined and compared to those of AGA infants. Results (%, x^2 test) in table below:

	N	Neo.Mort.	Hospit.	Apg.1min.<4	Apg.5min.<4
AGA	7551	0,17%	10,3%	2,4%	0,15%
SGA	842	0,70%	14,6%	3,9%	0,47%
p		<.003	<.001	<.01	<.05

From these results we conclude, that the additional group of SGA infants identified with our curve, has a significant higher risk of mortality and morbidity, stressing the clinical importance of using this curve to diagnose SGA newborns in Chile.

●1545 EXOGENOUS SURFACTANT THERAPY IN INFANTS WITH RDS: COMPARISON OF EARLY VS LATE TREATMENT.

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We report successful treatment of RDS with exogenous surfactant (TA). We studied the clinical course of three groups of infants with RDS. Control Grp. (C,n10) did not receive TA, early Grp. (E,n 10) received TA at a $\bar{x}$ age of 3½ hrs. Late Grp. (L,n10) received surfactant at $\bar{x}$=8½ hrs. of age. TA surfactant dispersed in saline was given via endotracheal tube. Results of sequential MAP and a/APO_2 are shown below. There were no differences in B.Wt. and GA between

		Before	1 hr. after	12 hrs. after	72 hrs. after
E(10)	a/APO_2	0.29±0.11	0.58±0.12	0.63±0.16	0.72±0.7
	MAP	10.0±2.3	6.3±1.2	4.32±0.5	4.1±0.7
L(10)	a/APO_2	0.26±0.09	0.51±0.13	0.62±0.13	0.54±0.15
	MAP	11.6±1.3	8.5±1.9	5.5±1.2	5.4±2.0
C(10)	a/APO_2	0.19±0.09	0.19±0.10	0.19±0.11	0.46±0.15
	MAP	11.7±2.6	11.1±2.6	10.3±3.0	6.0±1.3

the Grps. Before treatment MAP and a/APO_2 were the same in all Grps. Following therapy, MAP dropped significantly both in E & L Grps. ($p<.01$) by 1 hr. It decreased steadily in Grp. E. The differences between Grps. E and L were also significant ($p<.01$). Similarly, a/APO_2 improved significantly ($p<.01$) in both Grps. E and L 1 hr. following treatment. Chest x-rays cleared rapidly in E & L Grps., but not in Grp. C. However, treated Grp. had high incidence of silent PDA. There were no deaths in any group. We conclude that: a) TA treatment rapidly improves the course of RDS; b) E treatment rapidly decreases MAP than Grp. L; and c) both E & L treatment are equally beneficial.

1546 A CONTROLLED STUDY OF SURFACTANT TA IN PRETERM BABOONS WITH HMD.

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We studied the effects of exogenous surfactant (S-TA, Fujiwara) on the course of HMD in baboons delivered at 76% of term, 100 mg/kg of S-TA in saline was instilled via the E-T tube in 5 animals (Group S) at 2.0 hrs. of age; 3 animals were controls. Blood gases, lung compliance (CL) and mean airway pressure (MAP) were measured for 16 hrs. (Table: $\bar{x}$±SD, *p<0.02, **p<0.01). Variables

Time (age)		1 hr.	2.5 hrs.	8 hrs.	16 hrs.
CL	C Group	0.18±0.05	0.20±0.05*	0.16±0.07**	0.13±0.04*
	S Group	0.14±0.05	0.34±0.05	0.30±0.04	0.31±0.07
a/APO_2	C Group	0.20±0.09	0.25±0.07*	0.16±0.02**	0.23±0.05*
	S Group	0.19±0.11	0.45±0.15	0.44±0.17	0.45±0.17
FiO_2	C Group	1.0±0	0.93±0.05	0.93±0.06**	0.90±0.07**
	S Group	1.0±0	0.84±0.14	0.46±0.12	0.41±0.16
MAP	C Group	15.0±0.64	14.9±0.70	16.2±1.36*	18.4±3.77**
	S Group	14.7±1.22	13.3±1.76	12.0±3.30	11.7±1.89

were identical before therapy. Pre-treatment values of CL 0.14, a/APO_2 0.19 increased in S. Grp. within 30 minutes ($p<.001$), to improve and were increased to 0.34 and 0.45, respectively at 16 hrs.; in C Group they were 0.13 and 0.23 at 16 hrs. ($p<0.02$). Pulmonary pressure volume curves obtained at autopsy showed: in S Group at 5, 10 and 30 cms of H_2O distending pressure 12, 15 and 20 ml volumes were achieved (deflation) but in C Group they were only 1.2, 2.5 and 5.7 mls. ($p<0.001$). Our results suggest S-TA significantly improves CL, blood gases, and x-ray changes of HMD.