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MEZLOCILLIN (MEZ) VS. CONVENTIONAL COMBINATION ANTI-MICROBIAL THERAPY FOR PREMATURE INFANTS ADMITTED TO AN INTENSIVE CARE NURSERY (ICN). Frederick H. Wirth,

Thomas Rubio, Raymond D. Adelman, Edward H. Karotkin, Joseph Schulman. Departments of Pediatrics, Eastern Virginia Medical School, Children's Hospital of The King's Daughters, Norfolk, Virginia, University of California at Davis.

The combination of ampicillin with an aminoglycoside is the conventional antimicrobial therapy for premature infants admitted to an ICN. If MEZ alone is at least as effective as the combined use of ampicillin and amikacin (AMI), it should be preferentially used because it is cheaper and less toxic. Criteria for proven or suspect infections, and for the clinical response to therapy were used to evaluate each infant's response to the selected therapy. This evaluation was done without the knowledge of which antibiotic was used. One-half of 172 premature infants studied were randomly selected to be treated with MEZ. The efficacy of therapy for proven or suspect infections as well as the incidences of apnea, hypotension, and nephrotoxicity in this group were compared to the other group of 86 patients who received the conventional combination therapy. There were no differences between the two patient groups in their birth weights (1.39 kilo vs. 1.42 kilo), gestational ages (30 wks vs. 31 wks), nor in the incidences of apnea or hypotension. The clinical response in patients with suspect (42 patients) or proven (30 patients) infections were no different between the two therapies. AMI therapy was more nephrotoxic as demonstrated by a diminished postnatal rise in creatinine clearance in the patients receiving this drug. (42% vs. 23% rise in creatinine clearance) These data support the use of MEZ in premature infants with the diagnosis of infection.

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MEDIUM-CHAIN TRIGLYCERIDES IN FORMULAS AND PLASMA KETONE BODIES IN PRETERM INFANTS. Paul Y.K. Wu, John Edmond, Nancy Auestad, Savitri Rambhatla. Univ. of So. Cal. Sch. Med., Div. of Neonatology, Dept. of Peds., and UCLA Sch. Med., Dept. of Biol. Chem. Los Angeles, California.

The developing brain and CNS preferentially use ketone bodies, 3-hydroxybutyrate (3HB) and acetoacetate (ACAC) for sterol and lipid biosynthesis. Medium-chain triglycerides (MCT) have been added to formulas to improve fatty acid absorption. Because MCT is ketogenic, MCT may benefit preterm infants beyond the point of enhanced fat absorption. We measured the plasma conc. of 3HB and ACAC in 23 infants, (GA=33±0.8W). At the time of entrance to the study, the infants were receiving 110 cal/kg/24 h. Two studies were performed. Study I (11 infants): The infants were fed sequentially with 3 isocaloric (20 cal/30 ml) formulas (i) PM 60/40 (PM), (ii) Similac Special Care Formula (SCF), (iii) Similac 20 (SIM). In SCF over 50% of the fat consists of MCT while PM and SIM contain about 25%. Mean (+SE) plasma conc. of 3HB was 0.06±0.01, 0.14±0.03, and 0.05±0.01 mM when fed PM, SCF and SIM respectively. Study II (12 infants): The infants were fed SCF and SIM (or reversed). Plasma conc. of 3HB was 0.14±0.03 and 0.06±0.01 mM and ACAC was 0.05±0.01 and 0.03±0.01 mM, on SCF and SIM feeding respectively. SCF promotes a mild ketosis in preterm infants similar to that reported in breast fed term infants. Since ketone-body uptake by the brain has been shown to be directly proportional to plasma level, the differences in plasma 3HB and ACAC while on different MCT containing formulas could be important by providing the principal lipid precursors during the crucial period of myelination.

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INDOMETHACIN (I) THERAPY IN PREMATURE INFANTS WITH PDA - DETERMINATION OF THERAPEUTIC PLASMA LEVELS. T. F. Yeh, B. Achanti, R. Jain, H. Patel, R.S. Pildes.

Cook County Hosp., Dept. of Ped., Univ. of Ill., Chicago, Ill. To determine the therapeutic plasma levels of I, 38 infants (mean±S.D., B.W. 1.2±0.4 kg, G.A. 32±2 wks, Postn. A. 10.2±2.2 days) with sign. PDA were given 0.1 mg/kg or 0.3 mg/kg I as 1st dose followed by 0.2 and 0.3 mg/kg or 0.3 mg/kg at 24 hrs interval for 3 doses unless PDA closed. Plasma samples for I assay and Echo LA/AO ratios were obtained at 0.5, 1, 2, 4, 6, 12, 24, 36, 48, 60 and 72 hrs after 1st dose. Closure of ductus was assessed at 24 hrs after dosing. Side effects evaluated included 1) U/O 2) hyponatremia (<130 mEq/L) 3) hyperkalemia (>6.5 mEq/L) 4) NEC.

The mean $t_{1/2}$ was 21.6 hrs, AUC 0.3 L/kg, clearance 9.2 ml/kg/hr. Sign. correlation ($P<0.05$) was seen between $t_{1/2}$, clearance and postn. age, but not with G.A. or B.W. Ductus response and renal side effects correlated ($P<0.05$) with plasma I at 12, 24 hrs, and 6, 12 hrs post-dosing respectively but none correlated with peak I levels. Ductus response to I was dose-dependent and correlated with AUC of plasma I, but not renal side effects. The 12 hrs post-dosing plasma levels have the best correlation with ductus response and side effects; to achieve 50% success or more, a level of 0.5 µg/ml is needed. (Fig.)

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FATTY ACID (FA) AND LIPOPROTEIN (LP) BALANCE DURING NEONATAL EXCHANGE TRANSFUSION. Angela K. Young, Nisar Mir, Virgilio Carnielli, Tibor Heim, Paul R. Sywer.

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Essential and nonessential FA content of plasma LP was determined pre- and post-exchange and in donor's blood in 21 infants during exchange transfusion for neonatal hyperbilirubinaemia or other haematological reasons. Group I: Body wt: 1058±306 g (M±SE, Range:700-1670 g), Gest. age: 29.7±1.9 wks.(27-33), Postnatal age: 2.3±0.65 days(1-3); Group II: Body wt: 2907±661 g(2050-4100 g), Gest. age: 37.4±2.3 wks.(33-40), Postnatal age: 2.77±1.4 days (1-5). The sum of chylomicron, VLDL, LDL, HDL fatty acids (mg/dl; M±SE) is tabulated below:

	n	Pre-Exchange	Post-Exchange	Donor
Group I	12	96.9±7.74 ^a	152.73±11.58 ^b	170.1±15.71 ^b
Group II	9	90.4±10.94 ^a	136.87±15.85 ^b	208.3±23.89 ^c

a,b,c marked values are significantly different $p<0.02$ - $p<0.001$.

FA supply (Donor minus-Pre-exchange values) and clearance (Donor minus-Post-exchange values) were less in Group I (73.2 and 17.4 mg/dl) than in group II (118.0 and 71.5 mg/dl) respectively.

Conclusions: (1) Total and essential FA and LP levels are significantly lower in the infant's plasma than in the donor's, thus during exchange transfusion substantial amounts of FA are supplied, (2) the FA uptake by tissues is influenced by the maturity of the infant: low birth weight premature infants extract significantly less FA than the more mature counterparts, (3) FA clearance may be a function of lipoprotein lipase activity and/or the magnitude of supply.

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ACUTE RENAL FAILURE IN PRETERM INFANTS. A.M. Yuceoglu, B. Fineza, M. Sampaga, E. Holipas, New York Medical College, Department of Pediatrics,

Metropolitan Hospital Center, New York, NY. During the 48 to 72 hours after birth Creatinine Clearance and other urinary indices have been studied in 16 pre-term infants (5M/11F) with 1 minute apgar 6 or less. Weights ranged between 860-2400 gm., gestational age 28 to 36 weeks. Timed urine samples were collected for determining Creatinine Clearance and urinary electrolytes. Urinary indices (F Na and RFI) were calculated. Ten of 16 (62%) infants had evidence of Acute Renal Failure (ARF). Importantly a majority (8) had non-oliguric ARF whereas only two had oliguric ARF with less than 1 ml of urine/kg/hr. Both types were associated with perinatal asphyxia and/or Respiratory Distress Syndrome (RDS). All except one recovered.

G.A	28-31 N=8 28.8 ⁺ -0.7	32-33 N=1 32	34-36 N=1 36
B. Wt. gm.	1154.2 ⁺ -224.3	1600	1400
C _{cr} ml/ml	0.38 ⁺ -0.3	0.60	0.47
Creatinine/dl	1.09 ⁺ -0.3	1.2	1.3
V ml/kg/hr.	2.3 ⁺ -0.7	1.8	3.7
F _e Na %	6.3 ⁺ -3.5	3.0	4.9
RFI	9.0 ⁺ -5.0	4.2	6.6
Standards of Arant	C _{cr} ml/ml F _e Na %	0.76 0.8	1.09 2
			3.1 2

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NEONATAL GLUCOSE DYSHOMEOSTASIS IN A RAT PUP MODEL OF SEPSIS. W. Patrick Zeller, Jerome J. Hannigan, Linda Janusek-Witek, and James P. Filkins. (Spon.

by A. F. Cuttilla) Loyola University Stritch School of Medicine, Maywood, IL, Depts. of Pediatrics, Physiology and Nursing.

Endotoxin (ETN) plays a significant role in the morbidity and mortality of newborn sepsis. Hypoglycemia and lactic acidosis are prominent in sepsis neonatorum. The pathogenesis of this hypoglycemia is unknown. S. Enteritidis ETN was given to 10 day old 4 hour fasted, temperature controlled groups (n = 15) of controls (CT), mild sepsis, ED₂₀ (0.03mg/kg I.P.), and severe sepsis ED₉₀ (0.1mg/kg I.P.). Pups were dispatched at 0.5, 2, 3, and 4 hours. Standard analyses were used for glucose (G,mg/dl), lactate (L,mmole/L), and insulin (I,uU/ml).

Time	0	2	4
	G L I	G L I	G L I
CT	108 .8 28	89 1.1 17	71 1.0 21
SE	12 .2 9	5 .1 1	3 .1 3
ED ₂₀		106 1.8 16	64 1.9 15
		7 .1 2	3 .3 5
LD ₉₀		119 2.7 17	58* 2.1* 15
		6 .3 2	4 .4 2

* = p < .05

These data demonstrate that the hypoglycemic trend ($p<0.05$) seen at 4 hours in the LD₉₀ group is not the result of hyperinsulinemia. The elevated lactate levels ($p<0.05$) at 4 hours indicate anaerobic metabolic compensation.