

ketonemia and hypoglycemia influenced fetal substrate levels as reflected in amniotic fluid obtained at termination of the fast and from 11 additional non-fasted PW. Ketone acid levels in amniotic fluid increased 30-40 fold in fasted PW to levels comparable to maternal blood (4-5 mM/L); glucose levels in amniotic fluid in fasted PW (21 ± 1 mg%) were 40% below those in non-fasted PW ($P < .001$). In contrast, free fatty acid levels in amniotic fluid were not consistently increased by starvation though markedly elevated in maternal plasma. Conclusions: Pregnancy accelerates and exaggerates the ketogenic and hypoglycemic response to starvation. Increased ketone availability to the conceptus suggests that ketones become an important metabolic fuel for the fetus during maternal caloric deprivation.

Hyperammonemia complicating parenteral nutrition in infants.

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The parenteral administration of protein hydrolysate-glucose mixtures is being used increasingly to prevent tissue catabolism and promote growth in infants with various conditions which preclude adequate ingestion or absorption of calories. Although nitrogen retention can be regularly attained, several complications have been reported.

We have found elevated blood ammonia levels in 5 of 6 infants receiving parenteral nutrition. In 4 of these infants, blood ammonia was $>200\mu$ g%. All 3 low-birth weight infants in the series developed hyperammonemia. Elevations of blood ammonia were seen during the infusion of either casein or fibrin hydrolysates. In 2 infants receiving long term infusions the level of blood ammonia correlated directly with the rate of infusion of protein hydrolysate whereas blood urea nitrogen

during the period of sampling. Calcium values were grouped into 9 consecutive 5 hour intervals and the mean value of the calcium levels in each interval was plotted using the mid-point of the 5 hour interval for time. Using the standard polynomial regression for a quadratic response, the apneic subjects showed a decrease in calcium values to a level of 5.9 mgm./100 ml. at 32 hours of age. The minimum mean calcium value for the non-apneic babies was 8.3 mgm./100 ml. at 32 hours of age. Apneic babies had higher phosphorus values and lower total serum proteins than the non-apneic babies. Recurrent apnea was associated with an increased maternal age and a higher incidence of previous abortion. Apneic babies had higher incidence of 1 min. Apgar below 5 (75% vs. 30%). Apneic spells developed in most of the cases during the first 24 hours of life (22.1 hours average). Thus, for the most part the onset of apnea precedes the development of hypocalcemia. Calcium urinary losses were similar in both groups. Calcium therapy appeared to reduce the number of apneic spells in 6 out of the 14 infants.

Low arterial oxygen tension: A primary event leading to periodic breathing and apnea in preterm infants. HENRIQUE RIGATTO, JUNE BRADY, FE DUMPIT, and WARREN TICKNOR. *Univ. of Calif., San Francisco, Calif.*

Nine babies (b.w. 1-2kg) were studied 38 times in the first 35 days of life. They were given 21, 19, 17 and 15% O_2 to breathe for 5 min each, then 21, 15 and 21% O_2 for 5 min each. We determined the incidence of periodic breathing, ventilation/apnea (V/A) time ratio, respiratory minute volume and frequency, heart rate, P_{AO_2} and P_{ACO_2} , and the P_{CO_2} , P_{C_2} and pH of arterialized blood. With 15% O_2 the incidence of periodic breathing was substantially increased (see Table); with 17% O_2 the incidence was less pronounced but significant ($P < .005$).

	Periodic breathing	V/A ratio	VE L/min/kg	Resp. Rate	Heart Rate	PaCO ₂	PACO ₂	PaO ₂	PAO ₂	pH
21% O ₂	13%	2.0 ± .2*	.231 ± .017	36 ± 2	146 ± 2	42 ± 1	35 ± 1	68 ± 1	107 ± 2	7.319 ± .008
15% O ₂	71%	1.4 ± .1	.192 ± .015	30 ± 2	151 ± 2	44 ± 1	35 ± 1	56 ± 1	69 ± 2	7.332 ± .008
P	<.005	<.005	<.025	<.005	<.005	<.001	>.05	<.001	<.001	>.05

Means ± SE.

* At onset of periodicity (baby breathing 21, 19 or 17% O_2).

levels did not change significantly. Elevations of serum transaminases and bilirubin accompanied hyperammonemia in 3 patients.

These data show that hyperammonemia is a common biochemical abnormality in newborn infants receiving parenteral nutrition with casein or fibrin hydrolysates at commonly employed infusion rates. Liver cell damage may accompany this mode of nutrition. The cause of hyperammonemia is unknown, but may be the result of an amino acid imbalance in the infusate.

The association of hypocalcemia with recurrent apnea of prematurity. JUAN J. GERSHNIK, ABNER H. LEVKOFF, and ROBERT DUNCAN. *Med. Univ. of South Carolina, Charleston, S. C.* (Intr. by Warren E. Wheeler).

Serum calcium, phosphorus, magnesium and total proteins were determined at 8 hour intervals during the first 48 hours of life in 27 neonates weighing under 1750 grams at birth, who were monitored for apnea. 14 babies developed recurrent apnea during the first 72 hours of life. The remaining 13 neonates had no distress. None of the 27 babies received calcium

in 3 babies the oscillations in oxygen saturation (ear oximeter) increased from 4% during 21% O_2 to 12% during 15% O_2 . One baby became apneic (>20 sec) after prolonged periodic breathing with marked hypoventilation and low V/A ratio. These findings suggest that decreased P_{aO_2} may be a primary event leading to hypoventilation, periodic breathing and apnea in the preterm infant.

Visual estimation of body temperature in neonates. THOMAS K. OLIVER, JR. and ROBERT T. HALL. *Univ. of Pittsburg Sch. of Med., Pittsburgh, Pa., and Univ. of Missouri Sch. of Med., Columbia, Mo.*

Abdominal skin temperature of human neonates who are dressed and blanketed closely approximates core temperature. Although valuable in the detection of such illnesses as sepsis and hypoglycemia, the low yield of detecting abnormalities in term infants has resulted in temperature being measured at widely spaced intervals in most nurseries. This report describes a way of visually estimating body temperature using the cholesteric phenomenon. A mixture of cholesteric crystals was formulated