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INTERACTION EFFECTS BETWEEN TRACHEAL LIGATION AND CERVICAL CORD SECTION ON LUNG DEVELOPMENT IN THE FETAL RABBIT. Jonathan S. Wigglesworth, Karen E. Pape,

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We have reported that cervical cord section at C₁ - C₃ level in 22 - 26 day rabbit fetuses results in a 43% reduction in lung wet weight and a 16% reduction in lung DNA when compared to sham operated littermates at harvesting on day 28 - 29. This effect could be due to impaired lung liquid secretion in the cord-sectioned (CS) fetuses. To investigate this aspect, tracheal ligation (TL) with or without high cervical CS was performed in rabbit fetuses at 24 - 26 days which were harvested 2 - 4 days later. Lung weight, lung DNA, lung phospholipid phosphorus, lung lecithin phosphorus and lung lecithin palmitate were compared between fetuses subjected to tracheal ligation alone, those with TL + CS and intact littermate controls. TL alone and TL + CS groups had a mean increase in lung weight/gram body weight of 80% and in lung DNA/gram body weight of 15% four days after operation. No consistent change was demonstrated in total lung phospholipid phosphorus, lecithin and lecithin palmitate. Our results indicate: isolated fetal cervical CS results in lung collapse and impaired growth; cervical CS does not impair lung liquid secretion; retained lung liquid secretion has a powerful growth-promoting effect which completely reverses the growth retarding effect of cord section. We hypothesize that the CNS influences fetal lung growth by controlling the retention rather than the formation of lung liquid.

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LUNG MECHANICS IN INFANTS WITH MECONIUM ASPIRATION SYNDROME (MAS). T.F. Yeh, A. Barathi, L. Lilien, R.S. Pildes. Cook County Hosp. Dept. of Ped. Univ. of Ill. Chgo., Ill.

To evaluate the effect of MAS on mechanics of breathing, 10 infants with MAS (mean±S.E. gest. 40.6±1.0 wks, B.W. 3.2±0.2kg) and 12 control neonates (39.9±0.6 wks, 3.1±0.1kg, 1-3 days) were studied. Tidal vol. (TV), esoph. press. and flow rate were determined from an infant's pneumotachogram. Functional residual capacity (FRC) was measured by helium dilution method. Lung mechanics and arterial blood gases were studied in infants with MAS on the 1st, 2nd, 3rd and 5th day of age.

	Normal	Day 1(MAS)	Day 2(MAS)	>Day 2(MAS)
RR/min.	49.1±2.2	99.0 ±7.6*	82.0 ±10.3*	81.2 ±4.5*
TV (ml/kg)	6.9±0.3	4.2 ±0.3*	4.4 ± 0.4*	5.1 ±0.4*
Compl. (ml/cmH ₂ O)	6.3±0.5	3.5 ±0.4*	4.4 ± 0.6*	5.0 ±0.5
Sp.Compl. (ml/cmH ₂ O/L)	63.4±4.1	36.4 ±4.9*	40.6 ± 8.9*	41.4 ±4.6*
FRC (ml/cm)	2.0±0.07	1.97±0.09	2.58± 0.45	2.55±0.19†
FRC (ml/kg)	32.7±1.7	31.7 ±2.5	42.6 ± 8.2	39.3 ±2.5 †
Mean±S.E.	*p<.01	†p<.05		

Tachypnea, hyperventilation, high A-aDO₂ (483±72mmHg), low PCO₂ (26.9±7.8mmHg) are characteristic of infants with MAS. Low compl. on the 1st day suggested a degree of alveolar atelectasis. The persistent low sp. compl. observed after the 2nd day in spite of improved dynamic compl. indicates the increased FRC is not only due to alveolar opening, but also to alveolar overexpansion. Continuous distending pressure may be harmful in treating MAS late in the course of the disease.

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FUROSEMIDE IN PREMATURE INFANTS WITH TYPE II RDS. T. F. Yeh, M.M. Reveri, L.D. Lilien, R.S. Pildes. Cook County Hosp. Univ. of Ill. Dept. of Ped., Chgo., Ill.

Interstitial edema, effusion and increased bronchovascular markings are seen in chest x-rays of infants with Type II RDS. The possible beneficial role of furosemide given during the first 4 hrs. after birth was therefore studied in 17 consecutive premature infants with Type II RDS randomly divided into 2 groups. Group I (9) was given furosemide, 1mg/kg via umbilical catheter. Group II (8) did not receive diuretics. Diagnosis of Type II RDS was based on x-ray features and benign clinical courses. The mean±S.E. gestational age (32.8±.4 vs 34.8±1.1 wks), birth wt. (1.8±.1 vs 1.9±.2kg), and total 24-hr fluid intake (68.4±1.4 vs 74.1±6.2ml/kg) was similar in Group I and Group II respectively.

Group I	Initial	4-8hrs	Group II	Initial	4-8hrs
FiO ₂	41.2 ±1.7	40.6 ± 3.1	FiO ₂	44.0 ± 1.8	45.5 ± 5.0
pH	7.27± .03	7.34± .02*	pH	7.24± .03	7.23± .03*
PCO ₂	41.1 ±4.3	30.6 ± 2.9 *	PCO ₂	42.5 ± 5.0	42.0 ± 5.1 *
PO ₂	88.5 ±8.4	75.8 ±15.6	PO ₂	74.8 ±10.1	91.0 ±16.7

Infants in Group I had higher (p<.01) pH and lower (p<.05) PCO₂ levels at 4-8 hrs than those in Group II. Urine output (ml/kg/24hrs) and weight loss (gm/kg of birth wt/24hrs) were significantly higher (p<.01) in Group I (46.6±5.5 and 15.8±4.8 respectively) than in Group II (19.9±1.1 and 1.1±1.4). Electrolytes, initial and at 24hrs, were normal in both groups. The data indicate that furosemide is an effective diuretic and may facilitate improvement of ventilation in prematures with Type II RDS.