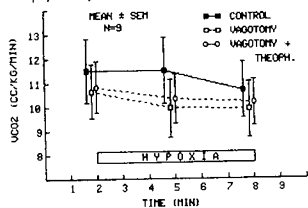


1756 C5A DES ARG-INDUCED SINUSITIS IN RABBITS: EFFECT ON BRONCHIAL REACTIVITY TO HISTAMINE. Nancy P. Cummings, Charles G. Irvin, Christopher Haslett, and Peter M. Henson (Spon. by James F. Jones). Dept. of Peds., Nat. Jewish Hosp. & Research Ctr. and Univ. Colo. School of Med., Denver.

Children with asthma frequently have sinus X-ray abnormalities. We have previously shown that most of these sinus X-ray abnormalities represent non-infectious inflammation, and treatment of sinusitis in these children improves asthma and decreases bronchial reactivity. A rabbit model was developed to investigate the effect of the upper respiratory tract inflammation of sinusitis on lower respiratory tract function. Rabbit maxillary sinuses were injected transcutaneously with the chemotactic peptide, C5a des Arg. By 4-6 hrs sinus membrane thickening and neutrophil accumulation occurred, remaining for 24 hrs. Pulmonary functions (resistance, compliance, thoracic gas volume, and specific conductance) and airway response to aerosolized histamine (0.3 to 100 mg/ml) were obtained weekly in rabbits: initial, with C5a des Arg-induced sinusitis, and 1 and 2 wk after sinusitis. Rabbits with sinusitis demonstrated hyperreactivity (50% decrease in specific conductance) to histamine at a 10x lower concentration. To assure the effect of C5a des Arg was not on the lungs, ¹²⁵I-albumin injected into the sinuses did not appear in the lungs; rabbit neutrophils isolated and labeled with ¹¹¹Indium-Tropolon and reinfused 30 min prior to C5a des Arg sinus injection resulted in neutrophil accumulation only in the sinuses, not in the lungs. These data provide evidence that non-infectious upper respiratory tract inflammation alters bronchial reactivity in a rabbit model similar to our findings in children with asthma.

1757 THE EFFECT OF THEOPHYLLINE AND THE VAGUS ON CO₂ PRODUCTION DURING ACUTE HYPOXIA IN THE NEWBORN PIGLET: RELATIONSHIP TO VENTILATORY DEPRESSION. Robert A. Darnall, (spon. by John Kattwinkel), University of Virginia School of Medicine, Department of Pediatrics, Charlottesville.

We have previously demonstrated that theophylline decreases the depressive phase of the hypoxic ventilatory response in the newborn piglet. It has been suggested that the sustained decrease in ventilation during hypoxia is the result of a decrease in metabolic rate. Also, theophylline increases CO₂ production (VCO₂) in infants treated for apnea. To determine whether VCO₂ decreases during hypoxia and to evaluate the effect of vagotomy and theophylline, we measured VCO₂ in nine newborn piglets less than three days of age during 6

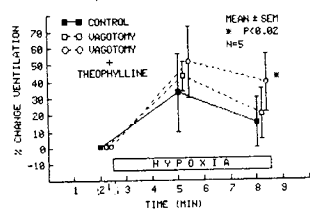


minutes of 10% oxygen breathing. Each animal was studied under three experimental conditions 1) intact; 2) after vagotomy; and 3) vagotomy + theophylline. Our experimental design allowed us to detect changes in pCO₂ and thus VCO₂ unaffected by compensatory changes in ventilation. Recordings of expiratory flow and integrated volume, EKG, arterial blood pressure, and expiratory CO₂ concentration were made during six minutes of hypoxia before and after vagotomy and then 30

minutes after the intra-arterial administration of theophylline (15 mg/kg). There were no changes in pCO₂, pH, or calculated HCO₃⁻ during hypoxia in any of the experimental conditions. As illustrated in the graph, there was no significant change in VCO₂ during hypoxia in the control group and this was not altered by vagotomy or theophylline. We conclude that in our experimental model, the decrease in ventilation during hypoxia in the newborn piglet at normocapnia is not secondary to a decrease in metabolic rate and suggest that the stimulatory effect of theophylline on ventilatory depression is due to a direct effect on the CNS rather than an indirect stimulation of metabolism.

1758 THE EFFECT OF THEOPHYLLINE ON THE HYPOXIC VENTILATORY RESPONSE IN THE NEWBORN PIGLET: ROLE OF THE VAGUS. Robert A. Darnall, (spon. by John Kattwinkel), University of Virginia School of Medicine, Department of Pediatrics, Charlottesville

We have previously demonstrated that theophylline, an adenosine antagonist, reduces hypoxic ventilatory depression in the newborn piglet. In order to investigate the possibility that the stimulatory effects of theophylline we observed were due to effects on vagal pulmonary receptors, we compared the effect of theophylline on the hypoxic ventilatory response in intact and vagotomized newborn piglets. Five newborn piglets less than 3 days of age were exposed to 10% oxygen under three experimental conditions: 1) intact; 2) after vagotomy; and 3) vagotomy + theophylline. Each animal was anesthetized with ketamine and xylazine, intubated, and the femoral artery catheterized. The vagi were identified but left intact prior to the onset of the experiment. Recordings of expiratory flow and integrated volume, EKG, and arterial blood pressure were obtained during six minutes of hypoxia first before and then beginning 30 minutes after vagotomy. Theophylline (15 mg/kg) was then administered over 10 minutes and after 30 minutes the experiment was repeated. The effect of hypoxia on minute ventilation in each of the three conditions is shown in the graph. Vagotomy alone had no effect on the hypoxic ventilatory response. The addition of theophylline,



however, resulted in a greater increase above baseline after 6 minutes of hypoxia (38.7 +/- 17.3%) compared to vagotomy alone (19.8 +/- 15.8%) (p<0.02). The difference in ventilation was due to changes in frequency rather than tidal volume. We conclude that vagal afferents do not influence the newborn hypoxic ventilatory response and that the effects of methyl xanthines on hypoxic ventilatory depression are not mediated by the vagus.

1759 SHORT TERM HOLDING AREA TREATMENT OF ASTHMATIC CHILDREN. Craig Willert, A Todd Davis, James J. Herman, Brenda B. Holson, Edward Zieserl. Northwestern University Medical School, The Children's Memorial Hospital, Department of Pediatrics, Chicago.

Status asthmaticus (SA) exacts a heavy toll on hospital resources and family finances. We undertook a randomized trial to determine if short-term treatment in a Holding Room (HR), compared to hospitalization, was safe, effective, and resulted in cost savings. Patients with SA after emergency room therapy with SQ epinephrine and bolus IV aminophylline and saline were eligible for study. 51 patients were hospitalized and 52 assigned to the HR. The groups were comparable in 36/37 medical, pretreatment and treatment variables. Two-thirds of the HR patients were discharged within 24 hours (mean 11.8hr). The other 1/3 required hospitalization. One-third of hospitalized patients received <1 day of IV therapy and 2/3 received <2 days of IV therapy (mean 45.6hr). HR patients were discharged immediately upon cessation of wheezing. Many hospitalized patients received 1 more day of in-hospital oral theophylline to ensure adequate serum concentrations. There were no statistically significant differences in recurrence rates between the 2 groups in the 28 days following SA. Medical costs were compared in those patients who received <1 day of IV therapy and had no recurrent episodes. The mean cost for HR therapy was \$550±226 and \$1,464±339 for hospitalized patients (p<.0001). We conclude: a) HR treatment of SA is as safe and effective as hospitalization; b) HR therapy is much less costly than hospitalization; and c) hospitalized patients need not be held for an additional 12-24 hours to determine serum concentrations while receiving oral theophylline.

1760 PULMONARY EPIDERMAL GROWTH FACTOR (EGF) RECEPTORS (R) IN THE FETUS (F) OF A DIABETIC (D) MOTHER (M).

U.Devaskar, V.Chechani, S.Devaskar, F.Sadiq and D. DeMello (Spons. W.J.Keenan). Dept. of Peds. and Pathology, St. Louis University, St. Louis, MO 63104.

Although F hyperinsulinemia is thought to be related to reduced surfactant synthesis, the mechanisms for the + incidence of RDS in the IDM remain unclear. Role of EGF in F lung (L) maturation is well established. Development of L EGF R in the F of alloxan induced (110 mg/kg I.V. at 14d) D rabbit doe was studied at 27 and 30d. Microscopic examination of F pancreas revealed hypertrophy of beta cells. Lung plasma membranes (LPM) were isolated and characterized by mg of protein, % recovery, DNA and 5'-nucleotidase. No. of R sites were calculated by ¹²⁵I-EGF binding assays. Scatchard plots were linear. (All data x ± SEM, *P<.02 compared to age controls)

	27d Non.D. (n=3)	27dD (n=3)	30d.Non.D (n=3)	30d.D. (n=4)
F Wt(gm)	28±2	27±1	27±1	27±4
F glucose (mg/dl)	55±2	*261±66	47±2	*190±35
M glucose	100±6	*329±53	94±5	*332±20
F insulin (uU/ml)	13±1	*64±17	16±2	*65±13
% S.B. ¹²⁵ I-EGF	1.2±.13	1.41±.3	1.32±.32	1.38±.31
No. R Site Sx10 ⁻¹⁰	12±3	6±2	-	-
Kd x 10 ⁹	8.3±3	3.3±.88	-	-

Conclusion: Alloxan induced M.D. does not influence the development of F pulmonary EGF R.

1761 RELATIONSHIP BETWEEN INTRACRANIAL ULTRASOUND (SU) ABNORMALITIES AND VENTILATORY ASSISTANCE (VA) IN LOW BIRTH WEIGHT (LBW) INFANTS. Marvin Leventer, Mehmet Y. Dincsoy, Foazia Siddiq, Behzad Talebian, Susan Tuck. (Spon. by Platon J. Collipp). Health Sciences Center, SUNY at Stony Brook, Nassau County Medical Center, Department of Pediatrics, East Meadow, NY.

Although the subependymal-intraventricular hemorrhage (SE-IVH) occurs frequently in LBW infants and in infants with multiple perinatal problems including RDS, it is not clear whether the use of VA has a direct relationship to SE-IVH. We studied 65 LBW infants with a birth weight (mean±SD) of 1486±567 gm, gestational age of 31.9±3.9 wks, 1 and 5 minute Apgar scores of 5.6±2.4 and 7.4±2.0 respectively. LBW infants with a birth weight of ≤2000 gm were subjected to a cranial US routinely at least once within the first 5 days of life. Infants with abnormal and normal US were divided into two groups and a comparison of the parameters relevant to the respiratory status between the groups follows:

	Resp. Distress (+)/(-) %	RDS (+)/(-) %	VA Used (+)/(-) %
Abnormal US	20/9 (69)	12/17 (41)	22/7 (76) *
Normal US	22/14 (61)	8/28 (22)	15/21 (41)

(+)=present or yes; (-)=absent or no; *K² p<0.01. There appears to be a significant relationship between SE-IVH and the use of ventilator during early newborn period in LBW infants. Whether the use of ventilator is contributory to the development of SE-IVH or conversely the SE-IVH is leading to the development of a need of VA is not clear in this study.