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VARIOUS *CANDIDA* AND *TORULOPSIS* SPECIES DIFFER IN THEIR MONOCYTE-STIMULATING CAPACITY.

Anne Kirsti M. Høgåsen, Tore G. Abrahamsen and Peter Gaustad*
Department of Pediatric Research and *Kapt. W. Wilhelmsen og Frues Bakteriologiske Institutt, Rikshospitalet, Oslo, Norway.

The incidence of childhood infections with *Candida albicans* and with non-albicans yeast species is increasing rapidly, particulary in immuno-compromised children such as oncologic and neonatal intensive care patients. We compared six *Candida* and *Torulopsis* species for their ability to stimulate the production of granulocyte-macrophage colony-stimulating factor (GM-CSF) and the complement components C3 and factor B in human monocyte cultures. These factors are important in host resistance against fungal infections. The addition of heat-inactivated *C. albicans, C. parapsilosis* or *C. sake* to freshly isolated monocytes from healthy volunteers resulted in a 19-36 fold higher GM-CSF concentration in the cell supernatants compared to controls after 5 days of culture. Treatment with *T. glabrata* gave only a 2-fold increase of GM-CSF, whereas *C. guilliermondii, T. candida* and latex beads were ineffective. Moreover, all yeasts stimulated monocyte C3 production and the four GM-CSF-inducing species also enhanced factor B production by the monocytes. The monocyte responses elicited by a specific yeast species may be of importance for its pathogenicity, and may also explain the predilection of some yeasts for particular underlying diseases.

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METABOLIC ADAPTATION AMONG SGA-INFANTS DETERMINED WITH MICRODIALYSIS.

Mikael Horal, Urban Ungerstedt and Claude Marcus, Dep. of Paediatrics, Huddinge Hospital and Dep. of Pharmacology, Karolinska Institute, Stockholm.

Because of delayed gluconeogenesis and small amounts of stored glycogen, hypoglycaemia often occurs among growth-retarded newborns. With microdialysis(MD), measurements of small molecules in situ can be determined. The MD probe is a double lumen plastic cannula with a tubular semipermeable membrane perfused with Ringer. With MD probes placed in the abdominal subcutaneous tissue five small-for-gestational-age and two appropiate-for-age infants were monitored immediately after birth. The infants showed marked sample to sample variations in dialysate glucose not seen among children, which may be due to poor hormonal regulation. Good correlation was seen between levels in blood and dialysate glucose(r=0.93). Dramatic variations in lactate (0.5-5.9 mM/L) were seen without obvious clinical correlation. The levels were higher than those reported in blood and may serve as an alternative energy source. Glycerol levels showed no correlation with the other investigated metabolites.

In conclusion; single blood glucose levels probably mirror glucose homeostasis of the neonate poorly. MD seems to be a valuable method for continuously measuring interstitial glucose levels in neonates.

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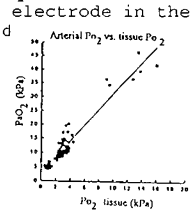
VARIATION IN INTRATISSUE Po_2 IN RELATION TO SURFACTANT REPLACEMENT IN SURFACTANT DEPLETED NEWBORN PIGS

Anna Hornakova, Tore Curstedt*, Bengt Robertson**, Ola D. Saugstad. Depts. Ped. Res. and Surg. Res., Rikshospitalet, Oslo, Norway, Danderyd Hospital* and St. Gorans Hospital**, Stockholm, Sweden.

Surfactant deficiency was induced in seven newborn pigs (3-5 days of age) by repetitive lung lavage. Natural porcine surfactant was instilled into the lungs. Intratissue Po_2 was measured continuously polarographically with a needle oxygen electrode in the medial muscle of one thigh and compared with arterial PaO_2. Intratissue Po_2 was initially 3.2±0.5 kPa (mean±SD) and fell to 1.5±0.7 kPa at the end of lung wash. 2.5 minutes after surfactant was instilled intratissue Po_2 started to increase reaching a maximum of 3.5±0.6 kPa after 20 min. There was a highly linear correlation between arterial and intratissue Po_2 (r=0.95,p<0.001, n=71).



Conclusion: Intratissue Po_2 fluctuates in parallel with arterial PaO_2 and is highly correlated with this. Replacement therapy with natural porcine surfactant in surfactant depleted newborn pigs quickly restores intratissue Po_2

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Urogenital Mycoplasmas in Neonatal Endotracheal Secretions and the Development of Chronic Lung Disease (CLD).

Richard Iles, Andrew Lyon, Philip Ross, Neil McIntosh
Simpson Memorial Maternity Pavilion, Edinburgh, Department of Microbiology & Department of Child Life & Health, University of Edinburgh.

Hypothesis: Urogenital Mycoplasmas are associated with the Development of Chronic Lung Disease in the immature infant.
Study Type: Prospective cohort study in a tertiary neonatal service
Patients: 63 consecutive intubated newborn infants less than 30 weeks gestation.
Measurements: The endotracheal secretions of all intubated neonates (n = 63) were examined weekly over a nine month period for all common bacterial pathogens..
Results: 25% (16) of the infants yielded positive for U urealyticum and/or M hominis. Positive culture was obtained on the first specimen in 69% (11) but in 31% (5) positive culture was only obtained on the second or subsequent specimen. CLD occurred in 38% (18) of the culture negative group, and in 94% (15) of the culture positive group ($p<0.001$). Of infants who were culture positive on the first specimen 81% (9/11) developed CLD of those positive on the second or subsequent specimen, 83% (5/6) developed CLD. There were no significant differences between the groups for gestation, birthweight, or time ventilated.
Conclusion: This data suggests that U urealyticum and M hominis are of aetiologic significance in the development of CLD. An intervention study has been started looking at the relationship between infection, acute inflammatory response and CLD and the effect of early treatment with erythromycin.

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IS TRANSCRANIAL - (tc) - DOPPLER SONOGRAPHY SAFE FOR NEONATES ?

Osman S. Ipsiroglu[1], J. Steck[2], E. Michel[3], T. Hahn[2], H. Pessenhofer[4], G. Jorch[5] and Arnold Pollak[1]
[1]Div. of Neonat., Dept. of Peds. Univ. of Vienna, Austria; [2]Dept. of Ultrasound, Fraunhofer Inst. of Biomed. Engin., St.Ingbert, Germany; [3]Dept. of Peds. Neukölln, Berlin, Germany; [4]Dept. of Physiol., Univ. of Graz, Austria; [5]Dept. of Peds., Univ. of Münster, Germany

AIM of the present study was a) to assess energy output of 5 available tc-Doppler instruments used in adults with respect to absolute power intensity and to linearity of built in power reduction systems, b) to develop guidelines for instrumental settings to be used in neonates in vivo.
METHODS: In vitro measurements of energy output (peak acoustic pressure (P_{max}), peak-negative acoustic pressure (p_-), output beam intensity (I_{ob}), and spatial-peak temporal-average intensity (I_{SPTA})) of pulsed tc-Doppler instruments were done according to the International Electrotechnical Commission (IEC 1157). In addition the linearity of power reduction was measured and the following parameters calculated: spatial average-temporal average intensity (I_{SATA}) and maximum continuous monitoring time prior to the maximum allowable temperature elevation of 1°C (American Institute of Ultrasound in Medicine, AIUM 1991).

RESULTS:

instruments (2 MHz probes)	I	II	III	IV	V
P_{max} (mW)	118	142	156	168	182
p_- (x 10^5Pa)	7.582	5.053	3.272	3.312	6.297
I_{ob} (mW/cm²)	185	222	243	263	285
I_{SPTA} (mW/cm²)	1267	747	972	889	1370
I_{SATA} (mW/cm²)	112.8	66.5	86.6	790.1	121.9
cont. monit. time (min) to 1°C↑	31.9	54.1	41.6	45.5	29.5
power reduction (%) to 10%↓	8	41	7	6	7

CONCLUSION: Our findings indicate that energy output and the linearity of power reduction of built in power reduction systems are very variable for different instruments. Thus, to assure infants' safety, each individual instrument has to be separatly evaluated with respect to energy output, linearity of power reduction, and the duration of sample intervals before clinical studies of cerebral autoregulation on a long term basis can be initiated.

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SURFACTANT AND N-ACETYLCYSTEINE STIMULATE THE HYALURONAN SYNTHESIS BY HUMAN FETAL LUNG FIBROBLASTS.

Hans Johnsson, Evi Heldin, Gunnar Sedin, Torvard C Laurent.
Departments of Pediatrics and Medical and Physiological Chemistry, Uppsala University, Uppsala, SWEDEN.

Lung hyaluronan (HA) concentration has been found to increase in rabbit pups treated with oxygen (Ped Res 1992;32: 635 & 1994;35:280), and in premature monkeys with respiratory distress syndrome (RDS) (Ped Res 1994;35:238-43). The mechanism behind this increase is unknown.
AIM: To determine if surfactant and N-acetylcysteine, used in the treatment of RDS, influence the HA synthesis by lung fibroblasts.
METHOD: Human fetal lung fibroblasts (ECACC WI-38, 30,000 cells/well), were cultivated in Exosurf (colphoscerile palmitate) 1.69-54 mg/ml, Curosurf (porcine surfactant) 10-80 mg/ml, or N-acetylcysteine 5-100 mg/ml for 48 hours. Subsequently, the HA concentration of the supernatant was determined, and calculated as % of the HA concentration obtained with 10% fetal calf serum, i.e. 467±85 ng/ml (=100%).
RESULT: With Exosurf and Curosurf HA concentrations of 127-154% and 102-132%, respectively, were obtained. HA concentrations increased from 0.2%±0.6 to 101%±44 with increased concentrations of N-acetylcysteine.
CONCLUSION: Surfactant and N-acetylcysteine stimulate HA synthesis by human fetal lung fibroblasts.