● 73

ACCURACY OF OSCILLOMETRIC BLOOD PRESSURE MEASUREMENT IN CRITICALLY ILL NEONATES.

Magdalena Gevers, Huibert R. van Genderingen, Harrie N. Lafeber, Willem W. Hack. Depts. Pediatrics-Neonatology / Clinical Physics, Free University Hospital, Amsterdam, The Netherlands.

Studies on accuracy of the oscillometric blood pressure (BP) measurement technique in neonates are based on various methods and materials and conclusions are conflicting. Using an accurate technique, consisting of a high-fidelity catheter-manometer system, we determined BP values invasively in the radial artery and, simultaneously, oscillometrically in the brachial artery in the opposite arm. 255 paired values of systolic (SAP), diastolic (DAP) and mean (MAP) arterial pressure were recorded in 51 critically ill neonates. For both SAP, DAP and MAP we computed mean differences (d) with 95% confidence intervals (CI) between the methods. We determined 95% limits of agreement to predict the range of intra-arterial values corresponding to each individual oscillometric value. Results are shown below in mmHg.

	SAP	DAP	MAP
d (± SD)	1.5 (± 4.8)	-1.0 (± 4.4)	-2.3 (± 3.9)
95% CI	0.9 to 2.1	-1.6 to -1.4	-2.7 to -1.9
95% limits	-7.9 to 10.9	-9.6 to 7.6	-9.9 to 5.3

In conclusion, the mean differences for SAP, DAP and MAP for the group are acceptable, but, the 95% limits to predict the intraarterial value are clinically unacceptably wide. Care should be taken when interpreting oscillometrically derived BP values in critically ill neonates.

▲ 74

The Modification Of Murine Nasal Membrane Potential Difference With Inhaled Sodium Channel Inhibitors

S. Ghosal, C.J. Taylor, Department of Paediatrics, University of Sheffield, U.K.

In Cystic Fibrosis absent chloride secretion and enhanced sodium re-absorption cause a raised nasal potential difference (P.D.). The use of Sodium channel inhibitors to block the enhanced Na⁺ re-absorption and make the secretions less viscous can be studied in the CF mouse. Knowledge of normal ion transport is required for the validation of such an animal model. The aim of this study was to measure the changes in nasal P.D. in normal MF1 strain mice after administration of inhaled Amiloride and Loperamide. Nasal P.D. was measured in 16 anaesthetised mice in the basal state and after saline nebulisation. They were then divided into two groups - group (a) was given nebulised Amiloride and group (b) was given nebulised Loperamide and the P.D. was measured. Mean basal nasal P.D. was -22.7 mV ± 4mV. With Loperamide mean P.D. was reduced by 15% to 19.4mV and with Amiloride by 33% to 15.2mV. In the next stage of our study the effect of the above drugs will be studied on CF mice. Previous studies show Amiloride reduces nasal P.D. and Loperamide reduces P.D. in bowel tissue. The changes observed with Loperamide were less than Amiloride probably because Loperamide also inhibits Chloride secretion in normal tissues. However, Cl⁻ secretion is absent in Cystic Fibrosis and we would expect to see a greater reduction in potential difference. In conclusion, administration of Sodium channel inhibitors like Loperamide and Amiloride reduce the nasal P.D. and Sodium re absorption in MF1 strain mice.

▲ 75

FAILURE OF HEAD GROWTH SPARING IN CYSTIC FIBROSIS

S. Ghosal, C.J. Taylor, M. Pickering, J. McGaw, J.H.K. Wales, Department of Paediatrics, University of Sheffield, U.K.

There is little data on head growth in CF, over the first two years, when brain growth is rapid and nutritional deficiency may affect brain cell growth and DNA content. We report the results of a longitudinal study in CF children from birth to 4 years of age. Head circumference (OFC), linear height and weight were measured monthly in 52 CF children by a single auxologist using standard anthropometric techniques. Standard deviation (SD) scores were calculated for height, weight and head circumference measurements. Mean length and OFC SD scores were significantly low at birth (-1.3 and -1.8 respectively, p<0.001). The length SD score showed a significant improvement from birth to 4 years (-1.3 to -0.07 p<0.001). The OFC SD score remained significantly low throughout (-1.1, p=0.001 at 4 years). Weight SD score also improved from a mean of -0.77 at birth to -0.42 at 4 years. Catch up head growth has been found in malnourished children after nutritional rehabilitation and also in children treated for isolated growth hormone deficiency. CFTR expression has been reported in brain although its significance is unclear. It is possible that CSF secretion is influenced by presence of CFTR and this is deficient in CF. Further studies using NMR scans to calculate ventricular volume may throw light on this matter. Intelligence in CF is normally distributed, but regular psychometric testing may be required to reveal deficiencies. In conclusion despite good nutritional management head growth lags behind gain in height and weight in CF children.

▲ 76

CHANGING THE EPIDEMIOLOGY OF INVASIVE HAEMOPHILUS INFLUENZAE (Hi) INFECTIONS WITH A VOLUNTARY IMMUNIZATION PROGRAM IN SWITZERLAND

Hanspeter E. Gnehm, Hanspeter Zimmermann, Dep. of Pediatrics, Kantonsspital, CH-5001 Aarau and Federal Office of Public Health, CH-3097 Berne
The epidemiology of Hi-infections in Switzerland prior to the introduction of a vaccine is known (Pediatr Res 1991, 30, 642), e.g. meningitis and epiglottitis have an annual incidence of 23 and 13/100'000 respectively in children ≤ 5 years. Surveillance of Hi diseases is warranted by a mandatory reporting system for physicians and laboratories to notify invasive infections. Data concerning the patient, the illness, the immunization status and bacteriological results are collected from special report forms. According to official recommendations large scale vaccination on a voluntary basis started 1991. Actually four different Hi Type b (Hib) conjugate vaccines are available. Prior to Hib immunization the annual average of Hi infections in children 0-15 years amounted to 176 between 1988 and 1990. In 1993 a total of 48 cases were reported, corresponding to a reduction of 73 %. Hi meningitis and epiglottitis were reduced by 80 and 78 % respectively. In children <2 years 80 % fewer infections were noted compared to the preimmunization era, but in children 5-15 years the decrease was only 28 %. Immunization failures were recorded. 93% of Hi infected children were not at all or inadequately immunized. Three of the four deaths (two <2 mo., one >7y old) between 1991 and 1993 could not have been prevented by the actual vaccine policy; the fourth lethal case (epiglottitis) has not been vaccinated. In conclusion the actual Hib immunization program effectively lowers the number of severe infections and deaths. To further reduce the infection rate, the vaccine coverage has to be increased.

● 77

ANEMIA OF ACUTE INFECTION IN INFANCY AND CHILDHOOD

Gülder Özkan, Ayşe S. Gökalp, Esra Baskın, Asım Gültekin.

Dept of Pediatrics, Faculty of Medicine, Cumhuriyet University SIVAS / TÜRKİYE

Aim : Acute infections could play an important role among the causes of mild anemia. The purpose of this study is to determine the prevalence of anemia of acute infection (AAI) and related diseases.

Design and methods : Randomly selected 200 children whose venous Hb levels were under 11 gr/dl were included in this study. They were between 4 months-16 years of age. Children having a definite infection, normal MCV, MCH and MCHC and increased ESR were classified as AAI.

The test performed : Hb, Hct, WBC, MCV, MCH, MCHC, ESR, Serum iron concentration (SIC), iron-binding capacity (TIBC), Fe: TIBC were carried out at the beginning and after 30 days. Serum ferritin concentration (SFC) and erythrocyte protoporphyrin (EP) values could not be performed.

Results : 1- 29,5 % of 200 children had AAI. 2- The infections related to AAI were pneumonia (22/59), acute gastroenteritis (9/59), upper respiratory tract infections (13/59), acute viral hepatitis (5/59), urinary tract infections (6/59) and the others (4/59). 3- After 30 days of infection Hb values had returned to normal and the increase was significant (p < 0.01). 4- A depression in Fe: TIBC was not observed in AAI.

Conclusion : Acute infection is an important cause of anemia in children. If SFC and EP couldn't be performed, the normal value of Fe: TIBC is a helpful parameter for AAI.

▲ 78

EXOGENOUS SURFACTANT AND NITRIC OXIDE IN EXPERIMENTAL ACUTE RESPIRATORY FAILURE

Diederik Gommers, Robert-Jan M. Houmes, Burkhard Lachmann

Dept. of Anaesthesiology, Erasmus University Rotterdam, The Netherlands

In this study, we examined the benefits of inhalational nitric oxide (NO) in combination with surfactant therapy on blood gases in an animal model of acute respiratory failure. **Methods:** Adult New Zealand rabbits were anesthetized, tracheotomized, paralyzed, ventilated, and respiratory insufficiency was induced by repeated whole-lung lavage. A new prototype of the Siemens Servo Ventilator 300 was used, which was equipped by the company with an in-built computerized NO application system. Three groups were studied: group 1 (n=6) received surfactant (25 mg/kg) followed by inhalation of NO. Five different concentrations (4-20 ppm) were inhaled for 30 min and blood gases were measured. After each NO inhalation, NO was turned off for a period of 30 min. Group 2 (n=3) received only surfactant (25 mg/kg). Group 3 (n=3) received only NO treatment in the same way as group 1. **Results:** In group 1, instillation of surfactant improved arterial oxygenation from 58 ± 12 to 302 ± 86 mmHg. Adding NO, PaO₂ could be further improved by an average of 22%. After turning off the NO inhalation, arterial oxygenation decreased. There was no correlation between the NO concentration and the changes in arterial oxygenation. In group 2 arterial oxygenation increased to 280 ± 61 mmHg and decreased slowly over time. In group 3, NO had no effect in improving gas exchange, independently of the NO concentration. **Conclusion:** After a low dose of exogenous surfactant, arterial oxygenation can be further improved by inhalation of an "optimal" concentration of NO.