

INTRAVENOUS IMMUNOGLOBULIN FOR TREATMENT OF SALMONELLA TYPHIMURIUM INFECTIONS IN PRETERM NEONATES

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Preterm neonates are far more susceptible than term neonates to severe infections. We planned to determine the role of intravenous immunoglobulin (IVIG) administration in the preterm neonates with Salmonella typhimurium infections. 47 preterm neonates between 33-37 weeks of gestational age and 1170 to 2100 grams in weight were included in this study. All neonates had Salmonella typhimurium infection progressing with intestinal or extraintestinal involvement. The neonates divided into two groups at randomly. Both groups were treated with Cefoperazone. Neonates in group I (n=22) did not receive IVIG. Neonates in group II (n=25) received IVIG at a dose of 500 mg/kg on the 1st, 2nd, 3rd and 8th day of infection. Blood samples were obtained before and after treatment for monitoring serum IgG.

Bacteremia occurred in 7/22 (31.8%) neonates who had not given IVIG and 2/25 (8%) neonates given IVIG, resulting in a statistically significant difference (p<0.05). Complications developed in 10/22 (45.5%) Group I and 4/25 (16%) Group II, the difference between two groups was significant (p<0.01). The mortality rate was 40.9 percent in Group I and 12.0 percent in Group II; the difference was also significant (p<0.05). The durations of antimicrobial therapy and recovery were reduced in Group II. The differences between group I and II were significant (p<0.01 and p<0.01). The eradication of Salmonella from intestine was evaluated, it was not different between the two groups within 3 months (p>0.05).

We concluded that IVIG treatment in combination with antibiotics in preterm neonates with S. typhimurium infections reduces the complications, mortality rate and the duration of therapy.

Randomised controlled trial to compare plasma protein fraction (PPF) and Dopamine in the hypotensive very low birthweight (VLBW) Infant.

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The aetiology of hypotension in the VLBW infant remains unclear. Present management normally involves awaiting a response to volume expansion before using cardiac inotropes. A recent echocardiographic study suggested that myocardial dysfunction was a significant feature in such infants [1]. This study was to test the hypothesis that Dopamine (to a maximum of 10 µg/kg/min) was more effective than PPF (to a maximum of 40 ml/kg) in restoring and maintaining the BP at or above the 10th centile for the VLBW infant.

39 infants were enrolled, median birthweight 870 grams (range 599-1452) and gestation 27 weeks (range 23-31). 20 received PPF and 19 Dopamine, as first line therapy, if their MEAN BP fell to < 10th centile.

Of the PPF group, 11/20 (55%) required treatment with Dopamine, whereas of the Dopamine group, only 2/19 (11%) required treatment with PPF before the BP recovered. Chi-squared= 6.9, p=0.009. The median dose of Dopamine required was 7.5 µg/kg/min and infused for a median duration of 18 hours (range 6-30). Neonatal complications were not altered by the use of dopamine alone.

Conclusion: Dopamine appeared to be more effective than PPF and should be considered at the outset in the management of the hypotensive VLBW infant.

[1] Gill A.B. Weindling A.M. Arch Dis Child 1993; 68: 17-21.

Pulmonary artery pressure (PAP) changes in the very low birthweight (VLBW) infant developing prolonged oxygen dependency (POD).

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Elevated PAP is invariably found in infants with chronic lung disease (CLD). Previous studies have focussed on changes in PAP in infants developing CLD but recent research has suggested that POD, defined as a persistent oxygen requirement at 36 weeks post-conceptual age (PCA) is a better predictor than CLD of subsequent morbidity and mortality.

We studied, weekly, the changes in PAP in 34 VLBW infants from day 1 to 36 weeks PCA. The time to peak velocity (TPV): right ventricular ejection time (RVET) ratio, measured from the pulmonary artery Doppler, correlated negatively with PAP. 19 infants developed POD, 15 did not and acted as controls.

Results: There was a similar rise in TPV:RVET in both groups over the first 2 weeks after birth. By the 3rd week the POD group had a significantly lower TPV:RVET ratio than the controls, p= 0.02. By 36 weeks PCA the ratio in the POD group was similar to the level obtained in the first week (0.28 vs 0.27, p > 0.05). In contrast the control group showed a significant rise over the same period (0.28 vs 0.34, p < 0.05).

Conclusion: Elevated PAP was invariably found in the VLBW infants who developed prolonged oxygen dependency. These changes were evident by 3 weeks post-partum suggesting that therapy aimed at preventing such changes would need to be introduced before that time.

Continuous monitoring of cardiac output in neonates and preterm infants by an intra-aortic Doppler-probe - a preliminary study of a promising new method

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Measurement of cardiac output (CO) in critically ill neonates remains a relevant tool. We evaluated the feasibility of on-line estimation of changes in CO by means of an intraluminal Doppler probe of 0.46 mm diameter.

Patients and methods: After a preliminary test in a rabbit we introduced the device via umbilical artery catheters of 5 Fr and 3.5 Fr, respectively, into two neonates and a preterm infant. Bodyweights were 3340 g, 3000 g, and 770 g. The different velocity profiles in the thoracic aorta were mapped and analyzed. The velocity profile in the descending aorta was then continuously derived to estimate CO.

Results: Analysis of the Doppler curves in different aortic regions allowed orientation and placement into the aorta desc, where high quality Doppler curves could be derived. The baseline signal of normal velocity pattern was very constant for 8-10 hrs, the sensibility with regard to pathophysiologic changes in flow was excellent. Mean average peak velocity (APV) was 16.4 cm/sec (range: 13.3-19.0 cm/sec), mean flow was calculated: 135 ml/kg/min (range: 111-179 ml/kg/min).

On the condition of a constant vessel diameter APV is a good parameter to estimate flow in the descending aorta. Calculated flow quantities do not contradict values measured by transcutaneous Doppler. Limitations of the method are the life time of 8-10 hrs of the device and the fact that measurement does not take place in the ascending aorta.

Conclusion: We proved in a pilot trial the high sensibility and reliability of a new Doppler device. This technique promises to be an excellent tool for monitoring hemodynamics of even extremely low birth weight infants.

THE INFLUENCE OF RESUSCITATION PROCEDURES ON CEREBRAL BLOOD FLOW VELOCITIES IN PRETERM INFANTS

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Aim: To assess cbfv in preterm infants immediately after birth, during cardiopulmonary adaptation, and during resuscitation procedures.

Methods: In a prospective-descriptive study maximum and mean velocities are measured in anterior cerebral arteries with a 5.5 Mhz short focused colour flow transducer, Hewlett Packard Sonos 1000. Patients: n = 18 preterm infants delivered abdominally, n = 9/9 - vertex/breech presentation. bw: 1210 ± 210 g, ga: 30.4 ± 2.1 wks.

Results: Changes of cbfv were classified in low (< 30%, n = 4), medium (30-80%, n = 7) and high (> 80%, n = 5). High changes (up to 350%) were observed in infants with low heartrate within the first min of life, during intubation and surfactant application. These infants needed almost 15 minutes to regain primary cbfv patterns.

Conclusion: Our study shows that during cardiopulmonary adaptation changes of cbfv are much higher than those reported so far, and major alterations of cbfv are caused by resuscitation procedures.

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Risk of seizure recurrence after early withdrawal of antiepileptic treatment in the neonatal period.

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Recent data indicate that a majority of neonatal seizures are subclinical and therefore only possible to diagnose with EEG or continuous EEG-monitoring. We estimated the risk of seizure recurrence after neonatal seizures diagnosed with a combination of clinical signs, EEG and continuous amplitude-integrated EEG-monitoring (Cerebral Function Monitoring, CFM).

Patients and Methods: During a two-year period (1990-1991) 1283 patients were treated in our NICU. Among these infants 58 (4%) had a seizure diagnosis. Antiepileptic treatment (AET) aimed to be as short as possible. Follow-up was made in surviving infants at an age of 12-24 months.

Results: Thirtyone of the infants with seizures were full-term babies and 26 preterm (GA 26-36 w).

The initial mortality was 38% (21/58), 54% in the preterm infants vs 19% in the fullterm babies. Among the 36 surviving infants available for follow-up AET was discontinued in 34. Two infants with abundant seizures in combination with multifocal epileptiform activity on the initial EEG's continued AET, one had recurrence of seizures. In 3 fullterm infants with <10 seizures no AET was given, none of these infants had later recurrence of seizures. Twenty-nine infants were treated for 1-65 days (median 4.5 days). Three infants (9%) had recurrence of seizures at 6-22 months of age, all had >10 neonatal seizures. The presence of structural changes in the brain (diagnosed with CT, MRT or US) did not increase the risk of seizure recurrence in the full-term infants (10% recurrence vs 15% in infants with no changes). Among the preterm infants most of the babies with structural changes died of IVH. We conclude that the risk of seizure recurrence within the first year of life after neonatal seizures is low. With close clinical and EEG follow up most AET can be discontinued when the baby is still in the NICU.