477

THE EFFECT OF ORAL DEXTROSE ON PAIN RELIEF OF NEWBORN INFANTS

A. Peirovifar, M.M. Gharehbaghi

Tabriz University of Medical Sciences, Tabriz, Iran

Background: In comparison with children and adults pain in the newborn infants is under assessed and under managed. Recently oral sweet solutions such as sucrose has been used for painful procedures in neonates. In this study we assessed the efficacy of 25% dextrose for managing of infants pain in neonatal peripheral venepuncture.

Methods: In a randomized controlled clinical trial, 60 term neonates were enrolled in study. They were randomized to receive oral dextrose(20%) or sterile water. Two minutes before venepuncture one group received 2 ml oral 20% dextrose and for the other group 2 ml oral sterile water was administered. Pain reactions were scored with CRIES pain scoring system, Crying time and heart rate at 5 minutes after venepuncture were recorded.

Results: There was no statistically significant difference between two groups of neonates in respect to gestational age, birth weight, gender and postnatal age. There were significantly lower pain score and shorter crying time in dextrose group after venepuncture(CRIES pain score: 2.23 ± 1.45 vs 6.17 ± 1.66 $P < .001$), (Duration of crying (sec) : 2.83 ± 1.64 vs 16.97 ± 8.49 $P < .001$) respectively. Heart rate at 5 minutes after venepuncture was not significantly different between two groups.

Conclusion: Using oral dextrose solution is a useful, non expensive and non pharmacologic method for managing pain of venepuncture in neonates.

478

HAEMODYNAMICS FOLLOWING INTRAVENOUS PARACETAMOL ADMINISTRATION IN (PRE)TERM NEONATES

K. Allegaert¹, M. Rayyan¹, A. Debeer¹, J.D. Hoon², G. Naulaers¹

¹Neonatal Intensive Care Unit, ²Center for Clinical Pharmacology, University Hospitals Leuven, Leuven, Belgium

Introduction: There are recent observations on the haemodynamics of intravenous paracetamol (hypotension) in adult IC setting (1). We therefore evaluated the haemodynamics following iv

paracetamol loading dose (20 mg.kg⁻¹) in (pre)term neonates.

Methods: Pooled analysis of observations on heart rate and blood pressure (mean, systolic, diastolic) collected during iv paracetamol pharmacokinetic studies in neonates already reported (2,3) or collected during the ongoing PK/PD iv paracetamol study (PARANEO, NCT 00969176). Heart rate and blood pressure (arterial access) were recorded just before and 30, 60, 120, 180, 240, 300 and 360 minutes afterwards. Data by median, paired analysis (Wilcoxon).

Results: Data in 64 neonates (GA 35 weeks, PNA 2 days, weight 2.425 kg) were available. Heart rate decreased from (pre) 143 bpm to 137 ($p < 0.01$), 140 ($p < 0.05$), 137 ($p < 0.01$), 133 ($p < 0.01$), and 140 ($p < 0.05$) bpm at 30, 60, 120, 180, 240-360 min. Mean blood pressure decreased (pre = 46 mmHg) to 43 at 60 min, 300 and 360 minutes ($p < 0.05$), while there were no significant changes in systolic or diastolic blood pressure.

Conclusions: Statistical significant, clinical minor effects on heart rate (-6 to -8) and blood pressure (-3 mmHg) were documented following iv paracetamol. These changes may reflect improved analgesia, but it seems cautious to consider impaired haemodynamics to be a relative contra-indication for intravenous paracetamol.

(1) de Maat MM, Eur J Clin Pharmacol 2010 online (2) Allegaert K, Arch Dis Child Fetal Neonatal Ed 2004;89:F25-8 (3) Allegaert K, Eur J Clin Pharmacol 2004;60:191-7

479

MODEL-BASED LIDOCAINE DOSING REGIMEN FOR SEIZURE CONTROL IN PRETERM AND TERM NEONATES

M.P.H. van den Broek¹, A.D.R. Huitema², F. Groenendaal³, M.C. Toet³, A.C.G. Egberts^{1,4}, C.M.A. Rademaker¹, L.S. de Vries³

¹Department of Clinical Pharmacy, University Medical Center Utrecht, Utrecht, ²Department of Pharmacy & Pharmacology, Slotervaart Hospital/The Netherlands Cancer Institute, Amsterdam, ³Department of Neonatology, University Medical Center Utrecht, ⁴Department of Pharmacoepidemiology & Pharmacotherapy, Utrecht University, Utrecht, The Netherlands

Objectives: Lidocaine is administered as an anticonvulsant to neonates that are not responding

to first-line anticonvulsants. For term neonates a dosing regimen has been developed (Malingré *et al.*, 2006), but it has not been evaluated for preterm neonates. The objective of this study was to develop an optimal dosing strategy for lidocaine in preterm and term neonates on basis of a newly developed population PK model.

Methods: Simulations were performed using NONMEM 6.2. Several requirements were defined:

- 1) The dosing strategy should be safe to be implemented on a NICU;
- 2) Seizure control requires rapid adequate plasma concentrations;
- 3) Only a short duration of dosing is required, however, doses should be reduced slowly to decrease the risk of neurological withdrawal symptoms;
- 4) a target plasma concentration of 6 to 7 mg/L is preferred by the clinicians;
- 5) plasma concentrations >9 mg/L are associated with cardiac arrhythmias and should be avoided.

Results: A body weight-based infusion strategy was developed using simulations. First, a bolus injection was chosen for all weight categories for rapid achievement rapid seizure control. This was followed by a 4-hour loading infusion. Then dosing was reduced in two steps during 6 and 12 hours, respectively. (regimen not shown)

With this regimen, the median concentration achieved at the end of the 4-hour infusion was 6.3 mg/L, (IQR 1.8 mg/L). Only 3.6% of the simulated individuals had concentrations >9.0 mg/L.

This new strategy should be a safe and effective regimen for neonatal seizure control. Prospective validation is in progress.

480

ACTIVITY OF CYP3A IN MOTHERS AND THEIR NEWBORNS USING 4B-HYDROXYCHOLESTEROL AS A MARKER

K. Wide¹, S. Ekmark-Sergel¹, H. Nylen², U. Diczfalusy², L. Bertilsson²

¹Div of Pediatrics, CLINTEC, Karolinska Institute, Stockholm, ²Department of Laboratory Medicine, Karolinska Institute, Stockholm, Sweden

Background: Pregnancy increases the activity of cytochrome P4503A (CYP3A). These enzymes

metabolize several endogenous substances, e.g. cholesterol, which is converted into 4b-hydroxycholesterol (4b-OHchol). We have suggested that 4b-OHchol can be used as a marker for CYP3A activity.

Aim: To study the activity in CYP3A in pregnant women and their infants by using 4b-OHchol as a marker.

Methods: 21 women and their 22 newborn infants (one pair of twins) were recruited at the delivery ward at Karolinska University Hospital, Huddinge. Levels of 4b-OHchol were determined in mothers and children from delivery to 72 h postpartum. 14 infants were born vaginally and 8 by elective caesarean section (CS). Follow-up after 3 months was performed in 10 mother-child pairs.

Results: Median levels of 4b-OHchol were increased in pregnant women compared to healthy adults. 3 months after delivery 4b-OHchol was still elevated in women giving birth vaginally. In contrast, women giving birth by CS had normal levels. Children born vaginally had significantly higher levels of 4b-OHchol compared to children born with elective CS, but both groups had lower levels than healthy adults. There was a significant increase in 4b-OHchol levels in both groups after 3 months.

Conclusion: Pregnancy activates the CYP3A enzymes. In newborns 4b-OHchol levels are low, but already after three months the children have CYP3A-activities comparable to that of healthy adults. Children born vaginally have higher levels of 4b-OHchol at birth, than children born with CS.

481

CAN A GENTAMICIN SPECIFIC CHART REDUCE NEONATAL MEDICATION ERRORS?

C. Flannigan¹, S. Kilpatrick², J. Redpath², M. Hogan²

¹Neonatology, Royal Jubilee Maternity Hospital, Belfast, ²Neonatology, Craigavon Area Hospital, Portadown, UK

Background and aims: Since the onset of incident reporting, medication errors have been noted to be one of the most common reasons for reporting a clinical incident and antibiotics have been shown to be one of the most common drugs associated with medication error in children. This trend was also noted in the neonatology department in Craigavon Area Hospital, a busy district general