1614 ANALGESIA FOR PAINFUL PROCEDURES IN CHILDREN. A SURVEY OF CURRENT PRACTICE IN SOUTH-WEST LONDON HOSPITALS

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¹D Son, ² Liu. ¹Paediatrics, Queen Mary's Hospital for Children, St Helier Hospital, Carshalton, UK; ²University of Heidelberg, Heidelberg, Germany

Background and Aims Knowledge about safe and effective management of pain in children is well known and documented. There is still a gap between knowledge and everyday practice. It seems children are still getting less analgesia than adults and newborn and infants less than children.

We conducted an audit/survey to get an overview of current analgesia practice for painful procedures in children.

Methods We used a questionnaire, in a paper and also online format, and distributed it to nursing and midwifery staff, Paediatric and GP junior doctors, and consultants working in Paediatric departments in hospitals in the South West of London. It included general questions about the perception of pain and also specific scenarios looking into the use of analgesia for a variety of procedures in children of different ages.

Results The amount of analgesia used was highest in the age group over one year and lowest in the newborn and one to four months groups. Throughout the different age groups, venepunctures were among the procedures when analgesia was used most often. Analgesia for intramuscular injections and lumbar punctures was never or only rarely used in the groups up to 4 months. Regardless of age, the procedure most commonly performed without analgesia was intramuscular injections.

Conclusions Use and knowledge of analgesia for painful procedures in children is still not optimal. We suggest that Paediatric department should offer better training for junior staff and also include a session on this topic as part of departmental induction programmes for new staff.

1615 EFFECTS OF GLUCOSE AND NON-NUTRITIVE SUCKING ON PAIN PERCEPTION

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S Beken, I Hirfanoglu, K Gücüyener, E Ergenekon, Ö Turan, N Altuntaş, E Kazancı, S Ünal, F Kulalı, E Önal, C Türkylmaz, E Koç, Y Atalay. *Gazi University Hospital, Ankara, Turkey*

Background and Aim Sweet tasting solutions and non-nutritive sucking are strong pain reducers for newborns. This study aimed to investigate effects of 30% glucose solution and non-nutritive sucking on amplitude of pain perception with pain scale, stress detector and near infrared spectroscopy (NIRS) during and after venipuncture.

Method Term newborns were randomised into two groups before venipuncture for bilirubin measurement.

Group 1 received 30% dextrose,

Group 2 received sterile water before venipuncture.

Recordings of skin conductance algesimeter (SCA, Med-Storm Innovation, Norway) from foot and NIRS (NIRO 200 Hamamatsu, Japan) from head were obtained starting 7 minutes before venipuncture until 7 minutes after. PAIN scores were obtained during and 7 minutes after procedure. Non-nutritive sucking was provided throughout the study.

Results 25 patients were included. Median PAIN scores were similar in both groups during venipuncture 5 (1–8) in Group 1, and 6 (1–10) in Group 2. Scores were decreased significantly seven minutes after procedure in both groups; as 1 (0–1) and 3 (1–3) in Group 1 and 2 respectively. In Group 1, cerebral blood volume (CBV) was increased from baseline after the procedure ($p=0.008$) however in Group 2 there was a decrease in CBV from baseline without

statistical significance. Cerebral blood flow (CBF) was increased from baseline in both groups without statistical significance. SCA values were slightly increased from 0.23 to 0.29 in Group 1 and from 0.23 to 0.59 in Group 2.

Conclusion Nonnutritive sucking and 30% glucose attenuate pain and stress responses during venipuncture however cerebral effects are open to investigation.

1616 PAIN EVALUATION IN PRETERM INFANTS USING SKIN CONDUCTANCE ALGESIMETER

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¹M Ahmed, ¹D Sobithadevi, ¹S Mostafa, ¹P Pore, ²J Maiden, ²S Boswell, ¹M Molnar, ³T Reynolds. ¹Paediatrics; ²Research Nurse; ³Clinical Chemistry, Burton Hospitals NHS Foundation Trust, Burton Upon Trent, UK

Background Assessment of pain is a challenge in neonatal setting. Visual, behavioural and physiological pain scales are not always reliable in premature infants. Few studies with limited sample size have been published on the reliability and efficacy of Skin Conductance Algesimeter (SCA) in monitoring pain in infants and children.

Aim To identify the clinical usefulness of SCA as a reliable and valid measure of pain intensity and stress response in preterm infants.

Methods Parents of all preterm infants admitted to the neonatal unit were invited to participate in the study. The usefulness of SCA was compared with the simultaneous measurement of 'Premature Infant Pain Profile' (PIPP) and 'Face, Legs, Activity, Cry and Consolability (FLACC) scores during invasive and/or painful procedures.

Results 46 measurements were recorded from 31 patients. The gestational age at birth ranged from 27+5 from 35+1. Mean PIPP scores Pre: 3.063 ± 1.272 , Pro: 9.175 ± 3.761 , Post 4.275 ± 1.506 . Two-tailed Paired t-test Pre - Pro, $t=10.82$, $P<0.001$; Pre - Post, $t=4.19$, $P<0.001$. Mean FLACC scores Pre: 0.713 ± 1.198 , Pro: 5.925 ± 2.99 , Post: 0.8625 ± 1.0919 . Two-tailed Paired t-test Pre - Pro, $t=9.51$, $P<0.001$; Pre - Post, $t=0.67$, $P=0.507$. Some correlations between SCA results and PIPP/FLACC did give statistically significant correlation coefficients.

Conclusions PIPP and FLACC scores were statistically significantly increased during the procedures. Further research is needed to ascertain the usefulness of SCA in preterm infants.

1617 ADMINISTRATION OF ROPIVACAINE WITH LOW DOSE KETAMINE REDUCES CYTOKINE EXPRESSION AFTER MAJOR ABDOMINAL OPERATION IN NEWBORN WITH CONGENITAL VISCERO-ABDOMINAL DISPROPORTION

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D Dmytriiev. *Anesthesiology and Intensive Care, Vinnitsa National Medical University, Vinnitsa, Ukraine*

Background Inflammation and nociceptive sensitization are hallmarks of tissue surrounding surgical incisions. Our studies were directed towards determining if administration ropivacaine with low dose ketamine alter cytokine production after major abdominal operation in newborn with congenital viscerio-abdominal disproportion.

Methods A 39 children after major abdominal operation was used to measure the effects of infiltrative administration ropivacaine 0.2% with low dose ketamine (0.1 mg/kg i.v.) administration on cytokine production in blood 45 minutes, 4 hours after operation. We examination 30 patient, undergoing major abdominal operation in children, first group receive combination ropivacaine with low dose ketamine, second group receive morphine (0.1 ml per year). For statistical analysis 2 tests were used.

Results Operative incised abdominal wall displayed profound allodynia which was reduced by ropivacaine with low dose ketamine combination in the 4 hours following incision. Blood samples these patients showed enhanced levels of 3 cytokines: IL-1 β , IL-6, tumor necrosis factor alpha (TNF α). Ropivacaine with low dose ketamine administration reduced levels. First group lower cytokines levels over second group (mean $\pm$ SD, IL-1 β - 4.4 ± 2.2 vs. 14.2 ± 2.4 pg/mg protein; IL-6- 204.8 ± 80.0 vs. 441.2 ± 90.4 pg/mg protein; TNF α - 14.4 ± 4.6 vs. 58.8 ± 7.2 pg/mg) ($p < 0.001$).

Conclusion Ropivacaine with low dose ketamine administration reduces cytokine expression. These studies suggest that Ropivacaine with low dose ketamine combination may alter the inflammatory reaction.

1618 IDENTIFICATION OF NOXIOUS EVENTS FOR NEWBORN INFANTS WITH A NEURAL NETWORK

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¹N Bressan, ^{1,2}C McGregor, ³M Blount, ³M Ebling, ³D Sow, ^{4,5}A James. ¹Business & Information Technology; ²Health Sciences, University of Ontario Institute of Technology, Oshawa, ON, Canada; ³IBM TJ Watson Laboratory, Hawthorne, NJ, USA; ⁴Paediatrics, The Hospital for Sick Children; ⁵University of Toronto, Toronto, ON, Canada

Background Recognition of pain experienced by immature and/or critically ill newborn infants in the Neonatal Intensive Care Unit remains a challenge despite the use of objective scoring systems that depend on physiological and behavioural parameters. We consider there is a need to identify pain using only physiological data streams.

Methods Data were collected from three preterm male, gestational age 27.25 ± 0.95 weeks (mean $\pm$ SD), birth weight 941.25 ± 189.31 grams. Heart rate (HR), mean arterial pressure (MAP), respiratory rate (RR), blood oxygen saturation (SpO₂) were considered for the NN Input Vector. NN's output were set to '1' for noxious stimuli pattern (NSP) define as: $HR \geq 160$ AND $MAP \geq 55$ AND $RR \geq 40$ AND $SpO_2 < 90$ ¹. Artifact events were captured in previous study² and integrated with real-time physiological data streams. In this study we correlated the nociceptive event identified by NN with the artifact nociceptive event.

Results Events 'vascular access' and 'reintubation' statistically coincide with the NSP defined in 100%. Event 'routine care' coincides in 52.67% with NSP. $HR \geq 160$ was evident in 24.6% of the event occurrence. The events were successfully identified by the NN, shown figure 1.

Abstract 1618 Figure 1

Conclusion This study showed correlation of artifact nociceptive event with the physiological data streams NN patterns verifying a positive relation between nociceptive response and non-invasive physiological response. NN developed previously proved to be an accurate tool for deployment in a clinical decision support system.

References

- Submitted to ESCTAIC 2012, Romania.
- 1st ACM International Health Informatics Symposium, 647–655.

1619 PAEDIATRIC PAINFUL SICKLE CELL CRISES: A PROSPECTIVE AUDIT OF ANALGESIC PRACTISE IN A TERTIARY PAEDIATRIC EMERGENCY DEPARTMENT

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^{1,2,3}MJ Barrett, ⁴S McCoy, ^{2,4}J Cronin, ^{2,4}A Murphy, ⁵A Wakai, ⁶R Geoghegan, ⁶C McMahon, ⁴S Walsh, ^{2,3,4}R O'Sullivan. ¹Paediatric Emergency Research Unit, Department of Emergency Medicine, Our Lady's Children's Hospital Crumlin (OLCHC); ²National Children's Research Centre, OLCHC; ³Department of Paediatrics, University College Dublin; ⁴Paediatric Emergency Research Unit, Department of Emergency Medicine, Our Lady's Children Hospital, Dublin; ⁵Emergency Care Research Unit, Midlands Regional Hospital, Tullamore; ⁶Department of Haematology, OLCHC, Dublin, Ireland

Introduction Although children with painful sickle cell crises (PSCC) frequently present to the Emergency Department (ED), pain in sickle cell disease is often under-recognised, under-treated and treatment may be delayed. We aimed to evaluate pain assessment and management in children presenting to the ED with PSCC.

Methods A 12-month prospective descriptive study of acute pain management of PSCC at an urban tertiary paediatric ED. Pain was assessed by the triage nurse or physician using a validated age appropriate pain scale (Faces, Legs, Activity, Cry, Consolability (FLACC) Scale; Manchester Pain Ruler).

Results There were 96 presentations in 66 patients with PSCC (Table 1). Nineteen (19.7%) patients received no pre-hospital analgesia.

Abstract 1619 Table 1

	Entire Cohort (n=96)	Severe pain Cohort* (n=56)	Moderate Cohort* (n=30)
Triage Pain Score	7/10 (IQR 5–8)	8/10 (IQR 7–10)	
Pain Score at 60 minutes	5/10 (IQR 2.25–8)	7/10 (IQR 5–8)	
Cases in line with PED analgesia guidelines (%)		45%	95%
Median time for opioid 'breakthrough' analgesia		87 minutes	

*severe pain defined as $\geq 7/10$ and moderate pain as 3–6 on age-appropriate pain scale

Conclusion PSCC pain is under-treated, under-monitored and adequate treatment of pain is delayed in our ED. Patients with severe pain appear at highest risk for treatment guideline violation. This is predominantly related to lack of opiate administration. An educational intervention, with/without the inclusion of an easily administered, fast-onset and short-acting opiate e.g. intranasal fentanyl, may decrease the time from ED arrival to effective pain relief.

1620 EMERGENCY ANALGESIA ADMINISTRATION IN CHILDREN: RETROSPECTIVE ANALYSIS AND RECOMMENDATIONS

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¹A Hamdan, ²M Thompson. ¹Faculty of Medical Sciences, Newcastle University, Newcastle upon Tyne; ²Emergency Medicine, Queen Elizabeth Hospital, Gateshead, UK

Introduction Emergency analgesia administration in children is inadequate and guideline is insufficient. We aimed to analyse our department's paediatric pain management to inform and recommend necessary alterations to current practice.

Methods 800 children (0–16 years old) presenting with painful conditions to Queen Elizabeth Hospital Emergency Department within a 40-month period (01/01/2008–28/02/2012) were randomly identified from a prospective audit database and allocated into four groups according to pain scores (no, mild, moderate and severe pain; 200 children in each group). Analgesia types and differential diagnoses were recorded.