Letter to the Editor

Current practice – Does oral sucrose give analgesia during painful procedures?

Dear Editor

Strong sucrose solution varying between 20-40% is routinely administered in hospitals around the UK to neonates and infants during painful procedures like phlebotomy and cannulation. This is supposed to provide analgesia as reported in previous studies by a reduction in the Premature Infant Pain Profile (PIPP) score[1]. The parents are informed by practitioners that the baby will get comfort and pain relief after administration of sucrose.

However, contrary to the routine practice and popular belief among paediatric practitioners, I was taken by surprise by a recent article published in *The Guardian* on 2nd September, 2010 titled "Newborn babies should not be given sugar as pain relief, says study"[1]. This was followed by a smaller print warning stating "Research in *The Lancet* warns that existing medical practice does not work and may cause brain damage". As it may not be long before parents start questioning the practice of administering sucrose for pain relief, I felt it would be appropriate to highlight this study to your readers.

The article by Slater et al was published online in *The Lancet* on September 1, 2010[2]. This was a double-blind randomised controlled trial conducted at the University College Hospital (UCH), London, involving 59 participants born at 37-43 weeks' gestation less than eight days old. The study group (n=29) received 0.5mL of 24% sucrose in purified water two minutes prior to clinically required heel prick test as compared to the control group (n=30) who received sterile water[2]. The treatment randomisation was done offsite at the UCH pharmacy.

The primary outcome measure of the study[2] was to determine the nociceptive brain activity recorded by a neonatal EEG cap. Reference and ground electrodes were placed at FCz and chest. The heel lance was time-locked to the EEG recording with an accelometer attached to the upper surface of the lancet. The nociceptive brain activity after use of the lance did not differ significantly between the infants of either group. The secondary outcome measure determining the PIPP score was however significantly lower in the sucrose group. The researchers suggest that the reduction in PIPP score could be due to brainstem inhibition of behaviour by sucrose which may also inhibit facial activity, however strong pain activation still occurs in the forebrain.

Similar observations were also made after a study involving 58 neonates done at the Klinikum der Johann Wolfgang Goethe-Universität, Germany in 2004[3]. The researchers highlighted that while oral glucose solution reduced pain expression and crying (PIPP score) during blood sampling, it did not prevent a rise in oxygen requirement, energy expenditure or heart rate.

A study in Melbourne, Australia[4], trying to establish bacterial contamination in a 33% sucrose solution had shown a small number of common skin organisms in three out of six sucrose bottles (in the unrefrigerated bottle and two of the bottles in clinical use accessed multiple times). The study failed to identify consistent or significant bacterial growth, but it may have practice implications as it demonstrates such bottles may be prone to bacterial contamination.

The researchers from the UCH concluded[2] that although oral sucrose does reduce observed pain behaviour, it has no significant effect on the magnitude of spinal nociceptive reflexes or on the acute activation of pain networks in the brain and blunt facial expression should not be interpreted as analgesia. As Professor Neena Modi, vice-president of the RCPCH, London, commented[1]: "If the above findings are confirmed, we currently do not have effective analgesia for painful procedures. A bigger study involving a larger number of babies is urgently needed to develop an effective analgesia. The current research by Slater et al reopens the questions as to what to best advise parents when considering pain relief to babies during painful procedures."

We also need to consider how to answer a query from an inquisitive parent who may have come across this news article in a newspaper and wants to know whether it is a safe practice to give sucrose to their newborn child. Other measures like using a few drops of breast milk or a pacifier alone[5] (a RCT found no significant difference in pain scores between 30% sucrose plus pacifiers and pacifiers alone) may be an alternative measure which may be more safe and baby friendly in light of the above study by Slater et al.

Reference

1. **Campbell D.** Newborn babies should not be given sugar as pain relief, says study. The Guardian, Thursday 2 September 2010. Accessed on 06/09/2010: http://www.guardian.co.uk/science/2010/sep/02/babies-sugar-pain-relief-warning/print
2. **Slater R., Cornelissen L., Fabrizi L. et al.** Oral sucrose as an analgesic drug for procedural pain in newborn infants: a randomised controlled trial. *The Lancet* published online September 1, 2010, 1-8.
3. **Bauer K., Ketteler J., Hellwig M., et al.** Oral glucose before venepuncture relieves neonates of pain, but stress is still evidenced by increase in oxygen consumption, energy expenditure, and heart rate. *Pediatric Research* 2004; **55**(4), 695-700.
4. **Harrison D.M., Daley A.J., Rautenbacher K. et.al.** Bacterial contamination of oral sucrose solutions. *Arch Dis Child* 2007; **92**(2): F155.
5. **Carbajal R., Chauvet X., Couderc S., Oliver-Martin M.** Randomised trial of analgesic effects of sucrose, glucose, and pacifiers in term neonates. *Br Med J* 1999; **319**: 1393-97.

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