Evaluating sucrose as pain management in retinopathy of prematurity (ROP) exams at the Alberta Children's Hospital Vision Clinic – Preliminary results

Michael Penny[1], Emi Sanders[2], Kyla Lavery[2], Stephanie A Dotchin[2]

[1]*Cumming School of Medicine, University of Calgary*
[2]*Division of Ophthalmology, Department of Surgery, University of Calgary, AHS*

Background and Purpose

- Retinopathy of Prematurity (ROP) is a sight-threatening eye condition that occurs in very premature infants which requires diligent screening and timely treatment.
- The Early Treatment for Retinopathy of Prematurity study showed the incidence of ROP was 68% among infants born at less than 1251 grams. [1]
- ROP examinations can cause significant stress on the patient and family alike, and controversy exists regarding the efficacy of sucrose for pain relief in outpatient neonatal ROP exams. [2-4]
- This study is a prospective, unblinded randomized control trial (RCT) to determine the efficacy of sucrose in reducing pain in babies under 12 months of adjusted age during outpatient ROP eye examinations, post NICU discharge.
- The hope is to improve the patient, family, staff, and physician experience at the ACH vision clinic.

Methods

Target number of patients to be included in the RCT	150	
Number of patients with complete follow up, included in analysis	24	16 (Additional patients enrolled, not yet analysed)
Number of patients randomised to each subgroup	9 (control)	15 (sucrose)
Exam #1 (baseline exam)	Standard treatment	Standard treatment
Exam #2 (Follow up exam)	Standard treatment	24% oral sucrose solution 2 minutes prior to the eye exam

Subjective data collected after exam

- Parent/caregiver experience feedback
- Ophthalmic nurse experience feedback
- Physician experience feedback

Objective data collected before, during, and after exam

- Oxygen saturation
- Heart rate
- FLACC (Face, Legs, Activity, Cry, Consolability score)
- Duration of exam

Results

24 infants for preliminary analysis

Average Gestational Age	Average Birth Weight
27+6 weeks	1060 grams
Range: 24+5 to 30+4 weeks	Range: 500 to 1845 grams

Objective FLACC pain score (during examination) **improvement**, compared to the baseline visit

Standard treatment	Sucrose treatment
0%	53%
0/9 patients	8/15 patients

Perceived discomfort **reduction** from surveyed parents, compare to the baseline visit

Standard treatment	Sucrose treatment
11%	47%
1/9 parents	7/15 parents

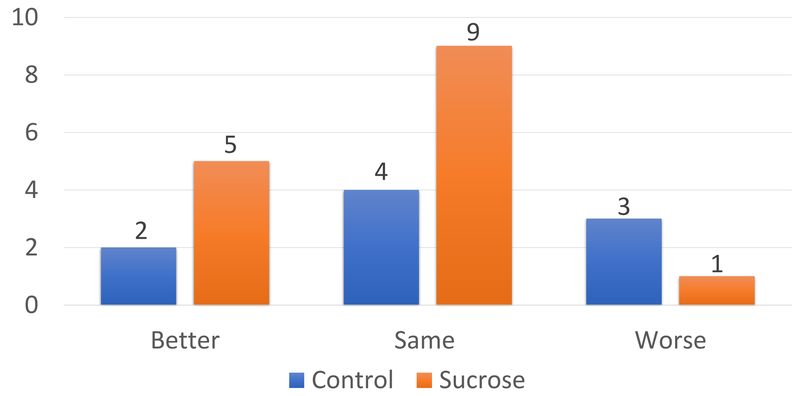

Figure 1 *– FLACC score at 2nd visit, 0-30 seconds post-examination, when compared to individual baseline score. FLACC score =* Face, Legs, Activity, Cry, Consolability *pain score.*

Acknowledgements: This project is supported by the Alberta Children's Hospital Vision Clinic.

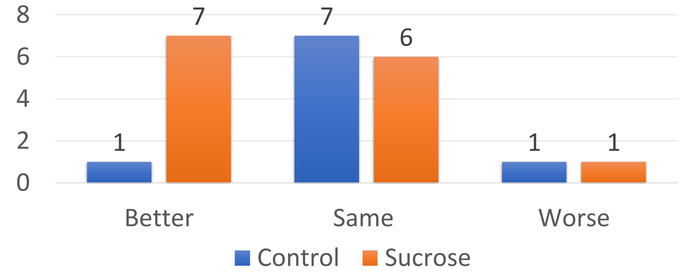

Figure 2 *– Perceived patient discomfort from surveyed parents, compared to baseline*

Discussion and Conclusions

- **Based on our preliminary results, the sucrose group showed a significant decrease in FLACC scores during examination when compared to the standard treatment group (P = 0.010).**
- The sucrose group also resulted in lower subjective discomfort scores in the parental survey compared to the control group, although not statistically significant (P = 0.178).
- These results are congruent with a recent Cochrane Review which found that sucrose appears effective for reducing procedural pain for preterm and term infants. [5]
- Limitations to this study include a small sample size, pain score subjectivity, and recognition that parents were not blinded to the treatment group during the second visit.
- **Although this study is ongoing, preliminary findings indicate sucrose may be helpful in ROP exams to reduce the amount of discomfort experienced by neonates and their caregivers. This has the potential to improve the overall experience at the ACH Vision Clinic.**

References

1. Good W V., Hardy RJ, Dobson V, et al. (2005)The incidence and course of retinopathy of prematurity: Findings from the early treatment for retinopathy of prematurity study. Pediatrics. 2005
2. Dilli, D., Ilarslan, N. E. Ç., Kabataş, E. U., Zenciroğlu, A., Şimşek, Y., & Okumuş, N. (2014). Oral sucrose and non-nutritive sucking goes some way to reducing pain during retinopathy of prematurity eye examinations. Journal of Paediatrics
3. Liu, Y., Huang, X., Luo, B., & Peng, W. (2017). Effects of combined oral sucrose and nonnutritive sucking (NNS) on procedural pain of NICU newborns, 2001 to 2016: A PRISMA-compliant systematic review and meta-analysis. In Medicine
4. Mitchell, A., Stevens, B., Mungan, N., Johnson, W., Lobert, S., & Boss, B. (2004). Analgesic Effects of Oral Sucrose and Pacifier during Eye Examinations for Retinopathy of Prematurity. Pain Management Nursing
5. Stevens, B., Yamada, J., Ohlsson, A., Haliburton, S., & Shorkey, A. (2016). Sucrose for analgesia in newborn infants undergoing painful procedures. In Cochrane Database of Systematic Reviews