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Utilizing a combination of Non-pharmacological interventions to reduce pain during retinal examinations in premature infants.

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Introduction

During their hospital stay, premature infants undergo an average of 3 to 5 retinal examinations to prevent vision impairment. But these can cause discomfort and pain, leading to unstable vital signs. Pain management for preterm infants can be categorized into pharmacological and non-pharmacological interventions. Beyond local anesthesia, intravenous sedatives and analgesics can effectively alleviate pain but may lead to adverse effects such as respiratory depression. Therefore, in clinical practice, non-pharmacological pain relief measures are frequently used as one of the most common methods to reduce heart rate and blood oxygen fluctuations caused by invasive examinations and procedures. This study evaluates the effectiveness of combination non-pharmacological interventions measures to reduce pain during ROP screenings.

Interventions

- swaddling the infant for 20 to 30 minutes before the examination
- non-nutritive sucking and oral feeding with breast milk or sugar water before the examination 2 minutes
- After the examination, showing signs of pain were provided with Containment care

Methods

This study was carried out in NICU at medical center in Taipei, Taiwan. The inclusion criteria were premature infants who underwent ROP screening examinations during their hospitalization from February 2022 to March 2023.Preterm infants which received sedation and analgesic medications treatment were excluded.

Then the pain score assessed by the Premature Infant Pain Profile-Revised(PIPP-r), during ROP examination and within 1 minute after the examination. The PIPP-r assessment scale has a maximum score of 21 points, with scores ranging from 13-21 indicating severe pain, 7-12 indicating moderate pain, and <6 indicating mild pain. The study aimed to compare the differences in pain score between the intervention group and the control group.

Results

A total of 60 premature infants participated in this study. This study. difference in PIPP-r scores during ROP examinations (p<.001). During examination periods, PIPP-r scores were significantly lower in the intervention group (12.3 ± 2.6) compared to the control group (15.6 ± 2.8). And Post-examination pain scores were significantly lower in the intervention group (0.6 ± 2.0) compared to the control group (7.9 ± 6.0). severe pain was 53.3% in the intervention group and 86.6% in the control group. There was a significant difference in the rate of severe pain (p<.01) between there two group.(Table 1.2)

Table1. Mean Values of PIPP-r Scores, Pulse Rate, and Oxygen Saturation Measured Examinations for ROP(n=60)

Group	Time	IG (n=30)	CG(n=30)	
		M±SD	M±SD	*p*
PIPP-r	During	12.3±2.6	15.6±2.8	< .001
	After	0.6±2.0	7.9±6.0	< .001
PR (bpm)	During	170.6±10.0	176.6±10.2	0.024
	After	161.5±10.2	165.0±7.7	0.135
Oxygen saturation (%)	During	95.4±2.5	90.9±3.6	< .001
	After	96.5±2.8	90.9±5.3	< .001

Table2. PIPP-r pain scores were categorized into mild, moderate, and severe pain(n=60)

Group	IG (n=30)		CG(n=30)		
PIPP-r score	During N(%)	After 1min N(%)	During N(%)	After 1min N(%)	*p*
Mild or nil	1(3.3)	29(96.7)	0(0)	9(30)	<.01
Moderate	13(43.3)	1(3.3)	4(13.3)	16(53.3)	<.01
Severe	16(53.3)	0(0)	26(86.7)	5(16.7)	<.01

Conclusion

Administering composite pain relief measures by nursing staff during retinopathy of prematurity (ROP) examinations is a non-invasive, effective, and safe method that significantly alleviates pain and discomfort in premature infants during the examination.

Keywords: Non-pharmacological pain relief, retinopathy of prematurity