

## EFFECT OF ORAL GLUCOSE AND THE RESPONSE TO PAIN IN THE TERM NEONATE

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### ABSTRACTS:

**Objective:** If neonates are exposed to severe pain or long duration pain stimulus, it may increase morbidity. Infants who experienced pain during neonatal period, will response intermittently to pain during next painful events. In the newborn and young infants who have undergone painful minor surgery, oral sucrose will provide safe way to analgesia. The aim of this study was to evaluate effect of oral glucose on the reduction of pain in neonates.

**Methodology:** All of the neonates aged 2-10 days and weighted >2500gm who were admitted for phototherapy and bilirubin and were not in the range of exchange, were included in this study. This study was carried out in department of neonatology of Abuzar Children Hospital and Imam Khomeini hospital. One hundred eight neonates were included. Each neonate was fed through a syringe every 30 minutes with 2ml of distilled water, D/W10%, D/W20%, D/W50% on the anterior portion of the tongue. Immediately, a lancet was injected into the heel of neonate and changes in the face and crying was recorded for three minutes after injection. Wong criteria was used for assessment of changes in the face and crying. The type of this study was Quasi-experimental and Fischer- exact test was used for data analysis.

**Results:** From 108 neonates who were fed with distilled water, D/W 10%, D/W20% and D/W50%; 1(0.9%), 41(28%), 101(93.5%), and 106(98.1%) showed decreased pain sensation respectively.

**Conclusion:** The results of this study revealed that oral glucose is the safe analgesic agent and is recommended for use in the neonatology ward before painful procedure.

**KEY WORDS:** Oral Glucose, Pain, Neonates, Analgesia.

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### INTRODUCTION

If neonates are exposed to severe pain or long duration pain stimulus, it may result in increased morbidity in them.<sup>1,2</sup> Infants who experienced pain during neonatal period, will response intermittently to pain during next painful events.<sup>3,4</sup> Changes in facial activity, shifts in the sleep/waking state and physiologic indices of heart rate and oxygen saturation are viewed as the most promising pain indicators in neonates older than 28 weeks gestational ages(GA).<sup>5,6</sup>

In the newborn and young infants who have undergone painful minor surgery, oral sucrose will provide safe way to analgesia. The aim of this study was to evaluate effect of oral glucose on the reduction of pain in neonates.

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## PATIENTS AND METHODS

All the neonates aged 2-10 days and weight >2500gm who were admitted for phototherapy and bilirubin and were not in the range of exchange, were included in this study. This study was carried out in department of neonates of Abuzar Children Hospital and Imam Khomeini Hospital. One Hundred eight neonates were included in our study. Each neonate was fed through a syringe every 30 minutes with 2ml of distilled water, D/W10%, D/W20%, D/W50% on the anterior portion of the tongue. Immediately, a lancet was injected into the heel of neonate and changes in the face and crying was recorded for three minutes after injection. Wong criteria were used for assessment of changes in the face and crying.<sup>7</sup> The type of this study was Quasi-experimental and Fischer- exact test was used for data analysis.

## RESULTS

From 108 neonates who were fed distilled water, D/W 10%, D/W20%, and D/W50%; 1(0/9%), 41(28%),101(93.5%), and 106(98/1%) showed decreased pain sensation respectively (Table-1).

## DISCUSSION

In some studies with neonates of young postconceptional age (PCA) and with neonates born close to term, facial activity and measures of heart rate were moderately related. Among neonates with a mean PCA of 28-29 weeks, Johnston et al. observed a correlation of  $r=0.55$  between the facial action of brow bulge and maximum heart rate during heel stick, and  $r=0.36$  between brow bulge and

standard deviation of heart rate.<sup>8</sup> There is notable evidence that oral sucrose could cause decrease of pain via release of endogenous opioid.

Ramenghi et al. studied the effect of oral sucrose in reduction of pain in premature infants. They studied 15 neonates aged 32-34 wks of gestation. They observed significant reduction in crying and duration of crying 5 minutes after needle injection.<sup>9</sup> Skosgdal et al. reported that 1ml of 30% glucose significantly reduced pain sensation. In contrast 10% glucose and breast milk has little or no effect.<sup>10</sup> Bauer et al studied oral sugar therapy on pain in premature and mature neonates. 2ml of (25% glucose, 30% glucose) reduced pain and crying and caused reducing increased heart rate after venous and capillary blood sampling.<sup>11</sup> In the study that carried out by Kass FC et al., the effect of oral glucose was compared with Dorsal Penis Nerve Block (DPNB) to reduction of pain in circumcision. The result of this study showed that oral glucose solution can not be used instead of DPNB for the reduction of pain, increased heart rate.<sup>12</sup> Abad F et al. reported that oral sucrose solution (24%) can act as a safe and cost effective agents and was comparable with EMLA to reduction of pain due to blood sampling.<sup>13</sup> Several blood sampling in the neonatology ward can cause agitation in neonates and parents. In this study, we conclude that the glucose solutions is a cost-effective methods for decreasing pain sensation before blood sampling in the neonatology ward. We recommend glucose solution before painful procedure as an analgesic substance. The highest glucose concentration, the more effect it will have on decreasing the pain.

Table-I: Effect of type of solution on the pain sensation (p<0005)

Type of Solution	Decreased Pain Sensation (%)	No effects (%)	Odds ratio (95%)
Distilled water	1(0/9)	107(99.1)	
D/W10%	41(28)	67(62)	1.6(1.38-1.85)
D/W20%	101(93.5)	7(6.5)	15.3(7.5-31.3)
D/W50%	106(98.1)	2(1.9)	53.5(13.5-211.2)

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