

# Pacifiers have greater analgesic effect than sweet solutions during venipuncture in full-term newborns

Carbajal R, Chauvet X, Couderc S, Olivier-Martin M. Randomised trial of analgesic effects of sucrose, glucose, and pacifiers in term neonates. *BMJ*. 1999 Nov 27;319:1393-7.

## QUESTION

In full-term newborns having venipuncture, what are the analgesic effects of glucose, sucrose, and pacifiers?

## DESIGN

Randomized (allocation concealed\*), blinded (outcome assessor was blinded to type of solution but not to the pacifier)\*, placebo-controlled trial.

## SETTING

Maternity ward of a hospital in Poissy, France.

## PATIENTS

150 eligible newborns (59% boys) who had a 5-minute Apgar score  $\geq 7$ , were medically stable, had not received naloxone during the previous 24 hours, and were not fed in the previous 30 minutes. 50 eligible newborns were not randomized because of nonavailability of the observer (investigator).

## INTERVENTION

Infants were allocated to 1 of 6 groups with 25 infants each: no treatment, placebo (2 mL of sterile water), 2 mL of 30% glucose, 2 mL of 30% sucrose, a pacifier, and 2 mL of 30% sucrose and a pacifier. The solutions or pacifiers were administered 2 minutes before venipuncture.

## MAIN OUTCOME MEASURE

Pain during venipuncture and blood collection using the Douleur Aiguë du Nouveau-né (DAN) scale, a pain score (0 = no pain, 10 = maximum pain) based on facial expression, limb movements, and vocal expression.

## MAIN RESULTS

The groups receiving glucose, sucrose, pacifiers, and sucrose plus pacifier had lower pain scores than the placebo group ( $P \leq 0.01$ ) (Table). The pacifier group had lower pain scores than the glucose or sucrose groups ( $P \leq 0.001$ ); pacifier and sucrose plus pacifier groups did not differ ( $P = 0.06$ ) (Table).

## CONCLUSIONS

In newborns having venipuncture, use of glucose and sucrose solutions and pacifiers reduced pain. Pacifiers were more effective than sweet solutions.

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For correspondence: Dr. R. Carbajal, Department of Paediatrics, Poissy Hospital, 78300 Poissy, France. FAX 33-1-39-27-44-33. ■

\*See Glossary.

### Median pain scores during venipuncture for newborns using the Douleur Aiguë du Nouveau-né (DAN) scale†

| Comparison                         | Median pain scores | Median difference (95% CI) |
|------------------------------------|--------------------|----------------------------|
| 30% glucose vs placebo             | 5 vs 7             | 2 (1 to 4)                 |
| 30% sucrose vs placebo             | 5 vs 7             | 2 (0 to 4)                 |
| Pacifier vs placebo                | 2 vs 7             | 5 (4 to 7)                 |
| 30% sucrose + pacifier vs placebo  | 1 vs 7             | 6 (5 to 8)                 |
| 30% glucose vs pacifier            | 5 vs 2             | 3 (2 to 5)                 |
| 30% sucrose vs pacifier            | 5 vs 2             | 3 (1 to 5)                 |
| 30% sucrose + pacifier vs pacifier | 1 vs 2             | 1 (0 to 2)‡                |

†DAN scale pain score: 0 = none, 10 = maximum. CI defined in Glossary.

‡Not significant.

## COMMENTARY

Effective measures to minimize pain and discomfort in newborn infants having procedures are of recognized importance (1). Carbajal and colleagues compared "sweeteners" with pacifiers and placebo in newborn infants having venipuncture.

The investigators used a 10-point evaluation tool for measuring pain (facial expression, limb movements, and vocal expression) recently reported by the principal investigator to have high internal consistency and interrater agreement (2); no demonstrated correlation with biochemical markers of stress exists. In this randomized controlled trial, the investigators recognize a potential bias with the use of pacifiers not being blinded. It is reassuring, however, that the differences between the pacifier and placebo groups were greater than those between the pacifier and sweet solutions groups.

Potential mechanisms of action of pacifiers (sensory dominance or facilitated self-regulation) are addressed in the article's discussion. Efficacy in preterm infants and during such other procedures

as heel lancing remains to be determined. While the use of pacifiers for newborn infants is often discouraged, this study shows that pacifiers are more effective than 30%-glucose or 30%-sucrose solutions, a finding that should stimulate clinical practice changes for newborn infants having venipuncture.

Douglas D. McMillan, MD  
Calgary Regional Health Authority  
Calgary, Alberta, Canada

## References

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2. Carbajal R, Paupe A, Hoenn E, Lencen R, Olivier-Martin M. APN: evaluation behavioral scale of acute pain in newborn infants. *Arch Pediatr*. 1997;4:623-8.