

## **Resuscitation of Infants by Nasal Route**

*[Tonkin SL, Davis SL, Gunn TR. Nasal route for infant resuscitation by mothers. Lancet 1995, 345:1353-1354.]*

In infants under 6 months of age, air normally enters the trachea by the nose because the tongue fills the oral cavity, and the oral route is open only when the infant is making muscular efforts such as crying or gasping. The present recommendation for infant resuscitation is for the resuscitator's mouth to cover the mouth and nose of the baby. The authors set out to test whether this recommendation is feasible.

We measured the dimensions of the faces of 28 babies aged between 2 and 4 months (the age when resuscitation is most often needed) and of the mouths of 25 of their mothers. Measurements of the infants were taken of the vertical distance between the intercanthal line and the nostril base, the nostril base and the margin of the upper lip, the margins of the upper and lower lips when the mouth was closed, and the margin of the lower lip and the lower margin of the chin. Twenty five mothers applied lipstick to their lips and then made prints of their mouths, opened as if to give resuscitation, on a flat sheet of paper. The width of each print was measured between the inner margins of the corners of the mouth.

For the 28 infants, the mean (SD) vertical distance from the bridge of the nose in the intercanthal line to the margin of the lower lip with the mouth closed was 5.1 (0.8) cm (range 3.8-6.0 cm). The mean width of the open mouths of the 25 mothers was 3.1 (0.4) cm (range 2.6-4.0 cm). The relative mean dimensions of infants' faces and mothers' mouths were compared with the mothers' mouths in the sideways position, as they would be for resuscitation, relative to the infants' faces. It was noted that the wider a mouth is opened vertically, the narrower it becomes sideways. Only 2 mothers would have just been able to cover the nose and closed mouth of 2 infants (not their own babies), but none of the other 23 mothers would be able to cover with their mouths the nose plus closed mouth of any of the other infants. None of the mothers would have been able to cover the nose plus the open mouth of any infant.

The mannequins often used to teach adults to resuscitate infants are misleading because they present a wide open mouth, thus implying that is the preferred route. It was recommended that the nasal route of air entry should be taught to parents for resuscitation of babies who have stopped breathing.

### **Comments**

This article focuses on an important aspect of resuscitation of infants based on the understanding of anatomy and physiology of infants. Sudden infant death syndrome and apparent life threatening events which usually occur among infants aged under 6 months, are

the conditions most likely to necessitate instantaneous resuscitation attempts by mother/attendant to save life. The current recommendations for such situations are that resuscitation be carried out by an adult covering the nose and mouth of the infant with his or her own mouth(1) although it is well known that the usual route for air entry in young infants is the nose(2). Reappraisal of this recommendation is of immense importance because most of pediatricians assume that it does not really matter which way the air enters the infants' lungs because we expect to cover both the nose and the mouth of the baby. The authors have tried to go back to the very basics of this concept.

Apart from taking the measurements of infants' faces from intracanthal line, nostril base, margins of upper lip and the margins of lower lip, the width of the opened mouth of mothers' has also been taken. The dimensions have been matched to see if it is possible to cover the nose and the mouth of the infants at the same time by mothers' mouth. The results are quite revealing when we realize that out of 25 mothers only 2 of them (8%) could cover the nose and closed mouth of 2 infants (not their own babies) and none of the mothers could have covered the nose plus the open mouth of any infant. These observations may also hold true for most of the female pediatricians/ resuscitators. This study certainly raises a question about the practical application of mannequins of infants which are used to teach resuscitation since they may not be anatomically correct and rather impractical. It is not possible to cover both the nasal airway as well as the mouth at the same time, particularly when an average built

adult female has to resuscitate a young infant of less than 6 months age. The authors, therefore, suggest that the person who has to resuscitate an infant who has stopped breathing should choose one or the other. Since timed radiographs have suggested that nasal airway is the physiological route for entry in infants(2), nose is much the preferred route. Secondly, a seal over the nose alone avoids displacement backwards of the mobile infant jaw with its risk of pushing the tongue into the pharynx and forming an obstruction to the air-way(3). However, one should be cautious to keep ones' mouth clear of soft nasal tip which is easily compressible. One should also clear the infants' nose of secretions by suction before starting ventilation.

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