Risk Factors of Sensorineural Hearing Loss in Preterm Infants

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Concerning the Article by Borradori C, et al.:

Dear Sir,

We have read with great interest the excellent article by Borradori et al. [1]. The authors demonstrated in a case-control study an association of sensorineural hearing loss with prolonged mechanical ventilation and hospitalization. Such an association has also been reported by others [2, 3], and different explanations have been proposed: prolonged hospitalization and ventilation means that the baby's condition is more severe, with resultant worse prognosis and poorer outcome [2]; preterm infants on long nasotracheal intubation are at risk of suppurative middle ear effusion [4]. However, none of these theories can explain entirely the association of increased incidence of hearing loss with prolonged ventilation and hospitalization.

We believe that this association is due to a variety of factors among which the noise is of primary importance. Although Borradori and co-workers reported no association between hearing loss and environmental noise, the noise generated by mechanical equipment beside the baby's ear is considerably high-

er than the environmental noise and is potentially hazardous to hearing. In a previous study, we have found a high noise level (51 ± 2.0 adjusted decibels; dBa) in our neonatal intensive care unit that persisted throughout the day; however, much higher levels (65 ± 1.3 dBa) were recorded beside the ears of babies during mechanical ventilation [5]. These noise levels are well above the level (50 dBa) that has been found to have a 25% probability of seriously affecting sleep in adults [6]. In addition, there is some evidence, at least in animals, that infants may be more susceptible to noise-induced hearing loss than adults [7]. Furthermore, a synergistic effect has been reported between ototoxic drugs and high noise levels on hearing loss in guinea pigs [8]. Finally, high noise levels may be hazardous in the presence of conditions such as hyperbilirubinemia, acidosis, or hypoxia which impair the hearing of infants. Douek et al. [9] presented clinical evidence supporting the assumption that incubator noise may be responsible for hearing loss in low birth weight infants.

The data presented above seem to indicate that noise is a potential hazard to the hearing of low birth weight babies, especially those receiving ototoxic drugs and having hypoxia, acidosis, jaundice, and septicemia, conditions often encountered in such infants. Thus, in addition to the

recommendation of Borradori and colleagues to pro-spectively and regularly perform audiological assessments in sick preterm neonates, one should urge neonatologists to make every effort to minimize the noise in the neonatal intensive care unit and to promote further research on the possible side effects of noise in high-risk neonates.

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