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Audiological function in a group of very low birth weight neonates in a tertiary hospital in Johannesburg, Gauteng.

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ABSTRACT

The main objective of the current study was to investigate the audiological function in a group of very low birth weight neonates in a tertiary hospital in Johannesburg, Gauteng. This was achieved through a retrospective record review of data from the Very Low Birth Weight Project at Charlotte Maxeke Johannesburg Academic Hospital (July 2006 – February 2007). Eighty six participants formed part of the analysis, with 35 males and 51 females. The mean birth weight of the participants was 1199 grams (range: 680 grams to 1500 grams). Statistical analysis included both descriptive and inferential statistics. As a result of attrition, only 27 participants were included in the inferential statistical analysis in the form of correlational analysis for comparison of findings between initial and repeat OAE screening results.

Descriptive statistics was used to analyse the most frequently occurring high risk factors and to determine the number of neonates presenting with '*refer*' findings. Chi-squared analysis was used to explore the relationship between the number of risk factors and initial OAE screening results, as well as for further analysis of the relationship between the type of high risk factors and initial OAE screening findings. Cohen's Kappa was used to analyse the correlation between initial and repeated OAE screening results.

From the high risk factors stipulated by the HPCSA (2007), NNJ, HIV, mechanical or assisted ventilation and NICU stay greater than 48 hours were the frequently occurring risk factors among VLBW neonates, with a frequency greater than 15%. Prematurity was found to be a clinically significant risk factor, and was the most frequently occurring, with all but one of the neonates being preterm. A high incidence of referral rates was found in the initial stages of OAE screening. Of the 75 neonates screened initially, 36% presented with bilateral '*refer'* results, and 23% presented with unilateral '*refer*' findings. Twenty seven neonates returned for follow-up screening. Of these, a bilateral '*refer'* result was present in 25% with a unilateral '*refer'* result in 13%. No statistically significant relationship was found between the number of risk factors and initial OAE screening results ($p < 0.05$). Furthermore, no statistical significance was established between the types of most frequently occurring risk factors (in isolation and combination) and initial OAE screening results. From initial DPOAE screening of these 27 neonates, 15 passed the initial screening (56%), and 10 presented with a refer result (37%). Repeated DPOAE screening as outpatients, revealed a bilateral '*pass'* result for 11 of the neonates, unilateral '*pass'* results for

seven, and a '*refer'* for six neonates. Statistical analysis revealed a poor agreement between initial and repeated OAE screening results ($p < 0.05$).

The small sample size, the reliance on OAE screening results only in the absence of diagnostic audiometry, and the limited follow-up results; prevented the confirmation of hearing loss, and hence, the true impact of the high risk factors on hearing outcome in a group of VLBW neonates. From the high risk factors stipulated by the HPCSA (2007), NNJ, HIV, mechanical or assisted ventilation and NICU stay greater than 48 hours were the frequently occurring risk factors among VLBW neonates, with a frequency of greater than 15%. Prematurity was the only risk factor that was present in isolation. The other risk factors existed in combination with each other, as well as prematurity. High referral rates were found in the initial stages of OAE screening. The percentage of bilateral refer results was higher than unilateral refer results for both initial and follow-up screening. Most neonates presented with between one to three risk factors.

Current findings however suggest that specific high risk factors are complex, and are influenced by a variety of factors that may result in different manifestations of hearing loss that audiologists need to be aware of. Results of the current study also suggest that high frequency tympanometry and/or AABR should form a crucial part of newborn hearing screening, along with DPOAE at initial or follow-up screening sessions.