التقييم السمعى للرضع والاطفال الذين يعانون من الركود المرارى المزمن
Audiological evaluation of infants and children with chronic cholestasis.

Abstract

Introduction and Rationale: Cholestasis is defined as reduced canalicular bile flow. Elevated serum concentration of direct bilirubin is a principal sign of cholestasis. Increased serum concentration of indirect bilirubin is present in most patients with cholestasis. Severe hyperbilirubinemia often results in hearing loss. However, the effect of low serum levels of indirect bilirubin on hearing levels in infants and children with chronic cholestasis has not been previously studied.

Aim of the work: To study the effect of level and duration of indirect hyperbilirubinemia on the hearing level of infants and children with chronic cholestasis.

Subjects and Methods: Thirty infants and children with chronic cholestasis were subjected to full history taking, pediatric clinical examination, careful otological examination and laboratory investigations (complete blood picture, serum total and direct bilirubin and liver function tests) and audiological evaluation including immittancemetry, transient evoked otoacoustic emissions (TEOAEs) and auditory brainstem response (ABR). Statistical analysis was conducted using the mean, standard error, standard deviation, student t-test and linear correlation coefficient by SPSS V17.

Results: Duration of hyperbilirubinemia revealed a negative significant correlation with TEOAEs reproducibility, TEOAEs response and TEOAEs amplitude at 1, 2 and 4.5 kHz. ABR results revealed a negative significant correlation between duration of hyperbilirubinemia and ABR wave latencies (III, V, I-III, III-V and I-V) and non-significant correlation with ABR threshold. As regards the indirect bilirubin level, there is statistically non-significant correlation with TEOAEs results. ABR results revealed a positive significant correlation between indirect bilirubin level and ABR threshold and ABR wave latencies (I, III).

Conclusions: Effect of chronicity of hyperbilirubinemunia is evident on cochlear function as increase in duration of hyperbilirubinemia is associated with worse cochlear function (mainly the apex). Effect of hyperbilirubinemia is mainly on the early ABR waves (I, III) (peripheral more than central). Level of hyperbilirubinemia rather than duration is the major risk factor on hearing level.

Recommendations: Future studies for assessment of long term effect of chronic cholestasis on central test battery in infants and children with chronic cholestasis. Also, we recommend inclusion of TEOAEs amplitude and ABR in the audiological screening of chronic cholestatic infants and children.

Key words: Cholestasis, hyperbilirubinemia, immittancemetry, TEOAEs, ABR, cochlear function.