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Title **AUTOMATED AUDITORY BRAINSTEM RESPONSE (AABR) AND OTOACOUSTIC EMISSIONS (OAE) DEVICES IN UNIVERSAL NEWBORN HEARING SCREENING**

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Aim

To assess the safety, efficacy and cost-effectiveness of automated auditory brainstem response (AABR) and otoacoustic emissions (OAE) devices in universal newborn hearing screening

Conclusions and results

There were 12 studies included in this technology review. Three studies were using OAE, one study using AABR, one study on comparison of OAE and AABR and four studies were combination of OAE and AABR for newborn hearing screening. Three cost analyses on universal newborn hearing screening also included in this technology review.

In conclusion, there were studies which showed various findings based on the types of screening protocols used. In OAE alone, the pooled referral rate and false positive rate was lower when screening was done after two days of life compared to within two days of life. However, it varies according to the frequency used. Then, for AABR alone, limited evidence to suggest double screening steps with AABR before discharge was effective to lower the referral rate. While comparing OAE and AABR, limited evidence to suggest that initial screening with AABR had significantly lower referral rate compared to initial screening with OAE for newborns younger than 48 hours. Nevertheless, the evidence showed that combination of OAAE and AABR was the best protocol compared to the single used device and was considered as cost-effective for long term practice. No retrievable evidence on safety. Both OAE and AABR have received United State Food and Drug Administration approval. Two cost-effectiveness studies suggest potential long-term cost saving for UNHS.

Recommendations (if any)

Both AABR and OAE can be used for UNHS. However, initial screening with AABR alone had significantly lower referral rate and fewer false positive responses compared to initial screening using OAE alone for newborn younger than 48 hours. Furthermore AABR alone can be used for screening healthy and high risk newborn, whereby OAE alone can only be used in healthy newborn. Hence, AABR is a better option if it to be used alone in UNHS. Nevertheless, evidence suggests that combination of AABR and OAE is the best.

Methods

Electronic databases were searched through Ovid MEDLINE(R) In-Process & Other Non-Indexed Citations and Ovid MEDLINE(R) 1948 to present, and Embase 1996 to 2015 June 08. Searches were also run in PubMed, Horizon Scanning databases, UM Library website, FDA website and INAHTA for published reports.

Search was limited to studies published within 1990s to 2000s. Google and Google Scholar were also used to search for additional web-based materials and information about the technology. Besides, additional articles from reviewing the references of retrieved articles also included.

Further research/reviews required

Demand for UNHS in general practice is increasing; however, cost-effectiveness study for local setting is warranted to ensure the best practice/protocol is fully utilized.

Written by

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