Integrating Auditory Steady State Response (ASSR) testing into the Paediatric Assessment Pathway: Sharing our Experience

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Introduction

• Auditory Steady State Response (ASSR) testing can be a useful part of the part of the audiological test battery in a variety of situations. Whilst ASSR is not able to diagnose Auditory Neuropathy Spectrum Disorder (ANSD), a major advantage of most ASSR systems is that multiple frequency stimuli can be presented to one ear (AC&BC) or both ears (AC) simultaneously.

• In 2022, we introduced ASSR under natural sleep into our paediatric assessment pathway following an increase in numbers of difficult-to-test pre-school age children, where traditional methods of hearing assessment (e.g. VRA, performance), combined with other tools such as filtered theme tunes and OAEs, were unsuccessful.

Current pathway

• Two behavioural assessments attempted.
• If unsuccessful after two appointments, option of objective testing under natural sleep discussed.
• If parents wish to proceed, a 2-hour ASSR appointment is arranged to coincide with nap time.
• Can consider the use of melatonin if appropriate.
• Discharge criteria - minimum of 3 frequencies at ≤20dBeHL on each ear, 4 frequencies preferred.
• ckABR @50dBnHL performed in each ear first to exclude ANSD.

Advice to Parents

The following advice is provided to parents prior to the ASSR appointment to increase likelihood of natural sleep:

• We advise you to wake your child earlier than normal on the day of the test and to keep them very active.
• We advise to bring your child to the appointment awake but very tired if possible.
• Please bring any items that your child associates with sleep, such as a drink, blanket, dummy, or teddy.
• It can be useful to bring your own pushchair, so your child has a familiar place to sleep.

Methods

• We audited ASSR appointments completed as part of a paediatric assessment pathway between July 2022 and July 2023.
• All ASSR assessments were completed using the Interacoustics Eclipse® 90Hz ASSR protocol with inserts/headphones.
• Where BC was indicated, ABR testing was used.

Results

• A total of 32 patients were seen for ASSR testing; age range 17–40 months, average age 29 months.
• 72% of children were able to be discharged after one ASSR appointment.
• Total number of ASSR appointments: 37
• Average number of ASSR appointments per patient: 1.2
• Number of appointments where melatonin was used: 11
• 4 frequencies for both ears obtained for 30 out of 32 patients.
• Average test time for ASSR once child is asleep: 5min 49secs (range 2min 23secs to 26mins 27secs)
• Average number of appointments in normal assessment clinic prior to ASSR per patient: 2.6

Conclusions and Next Steps

• ASSR is a useful tool in the paediatric assessment pathway; nearly three-quarters of children were able to be discharged after one ASSR appointment. This reduces demand on behavioural assessment clinics and reduces parental and child anxiety/frustration when multiple behavioural appointments are not successful.
• Important that ASSR limitations are understood/recognised i.e. need to rule out ANSD.
• Having a melatonin protocol in place is useful and clear advice to parents prior to the appointment is important.
• Whilst the test itself is quick, ASSR can be time intensive as longer appointments are needed to get children to sleep.
• Minimum discharge criteria in behavioural clinics where there are no risk factors/parental concerns – do we need to review these to reduce the number of patients needing ASSR? Could we discharge on other information e.g. OAEs/filtered theme tunes? No national guidance on this - what are other services doing?
• Develop confidence in using BC ASSR.
• External Peer Review of ASSR traces?

Other uses for ASSR in our paediatric clinic

• Measuring thresholds for children with known PCHI who are difficult to test, to provide information for HA fitting.
• Suspected non-organic hearing loss in older, awake children.
• Hearing assessments in theatre.

References:

1. British Society of Audiology Practice Guidance Auditory Steady State Response (ASSR) Testing Date: April 2022