Trainees’ confidence at the neurological assessment and amplitude integrated electroencephalography in neonatal hypoxic ischaemic encephalopathy

Anthony R Hart and Kirsteen Mackay look at trainees’ confidence in carrying out the neurological assessment of a neonate with hypoxic ischaemic encephalopathy and managing amplitude integrated electroencephalography.

Sir,

Hypoxic ischaemic encephalopathy (HIE) is a common reason for neonates to be admitted to a neonatal unit. The paediatric trainee typically leads the initial resuscitation and stabilisation before senior help arrives, and may then communicate their assessment of the baby’s neurology and degree of encephalopathy to a tertiary centre. A decision is subsequently made as to whether transfer for further treatment, like hypothermia, is necessary. On admission to the tertiary centre, it is also usually a trainee who assesses and stabilises the baby first, as well as arranging monitoring, like amplitude integrated electroencephalography (aEEG), and treatment. In the absence of a detailed test of neonatal conscious level, aEEG could be considered an extension of the neurological assessment. Little evidence exists on trainees’ confidence at performing the neurological assessment of a neonate with HIE or managing aEEG.

We asked paediatric trainees across three deaneries in the Yorkshire and Humber region via eportfolio to complete an online questionnaire. The questions asked trainees to indicate how confident they felt performing a neurological assessment of a neonate with HIE and using the aEEG with a Likert scale of 0-10. Differences in scores between trainee groups were studied using the Mann-Whitney U test, with p<0.05 assumed statistically significant.

54 responses were obtained, 17.7% of available trainees. 44 (81.5%) were ST4-8 and 10 (18.5%) were ST1-3. 27 (50.0%) were trainees in South, 21 (38.9%) in West, 4 (7.4%) in East Yorkshire, and 2 (3.7%) in other regions.

ST1-3 trainees were less confident than ST4+ at performing the neurological examination and siting aEEG leads, reflecting their level of experience (Table I). Trainees scored their confidence in interpreting aEEG lower than the neurological examination. When asked to list all aspects of the neurological examination they routinely perform, many trainees omitted important aspects (Fig. 1).

Where trainees do not feel confident, or do not know how to complete a task, we might expect them to avoid it; however, all grades of trainees reported they performed a neurological examination in neonates with HIE on both admission and discharge. This is at odds with our clinical experience, where it is rare to find a documented, detailed neurological examination. This discrepancy may be explained by trainees’ reluctance to admit they lack confidence, or by them feeling confident but not documenting their findings. The fact many aspects of the neurological examination were omitted by trainees suggests the former, although we acknowledge that doctors may not have listed aspects of the examination they would normally perform, or may have listed things they don’t do in real life.

Our results do not represent trainee competence and further work is required to examine trainee competence at the neurological assessment and aEEG interpretation. Nevertheless, our findings may reflect a lack of resources, local or national training on the neurological
assessment of a sick neonate and aEEG. For example, trainees may not be familiar with standardised examinations, like the Hammersmith Neonatal Neurological Examination.\textsuperscript{1,2} It is also possible that this assessment is not considered “fit for purpose” in sick neonates who may be ventilated, cardiovascularly unstable, or have multiple lines in-situ.

Further work would determine whether:

- The current neonatal neurological examinations are useable in sick neonates.
- The current neonatal neurological examinations answer the questions clinicians wish to know.
- Additional training needs are required to improve the neurological assessment.
- A neonatal conscious scale would provide useful clinical information.

If the current tools are sufficient, then educational packages need to be designed to increase confidence and, if necessary, competence. If not, better tools need to be designed to assess the sick neonate neurologically.

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References

### Table 1: The median scores and range for the questions for the whole cohort and divided by junior and senior trainees

<table>
<thead>
<tr>
<th>Question</th>
<th>All trainees</th>
<th>ST1-3</th>
<th>ST4-8</th>
<th>Statistically significant between trainee groups?</th>
</tr>
</thead>
<tbody>
<tr>
<td>How confident do you feel in managing a neonate with HIE?(^1)</td>
<td>7 (range 0-10)</td>
<td>5 (range 0-8)</td>
<td>7 (range 0-10)</td>
<td>Mann Whitney U 123.0 *p=0.032</td>
</tr>
<tr>
<td>How confident do you feel doing a neurological examination in a neonate with HIE?(^1)</td>
<td>6 (range 0-10)</td>
<td>5 (range 1-6)</td>
<td>7 (range 0-10)</td>
<td>Mann Whitney U 83.5 *p=0.002</td>
</tr>
<tr>
<td>How often do you do a full neurological examination around the time of admission in a neonate with HIE?(^2)</td>
<td>8 (range 1-10)</td>
<td>7.5 (range 3-10)</td>
<td>8 (range 1-10)</td>
<td>Mann Whitney U 188.0 p=0.94</td>
</tr>
<tr>
<td>How often do you do a full neurological examination around the time of discharge in a neonate with HIE?(^2)</td>
<td>8 (range 1-10)</td>
<td>7.5 (range 3-10)</td>
<td>8 (range 1-10)</td>
<td>Mann Whitney U 165.5 p=0.72</td>
</tr>
<tr>
<td>How confident do you feel positioning and attaching the leads of a aEEG / cerebral function monitor to a baby's head?(^1)</td>
<td>7 (range 0-10)</td>
<td>4 (range 0-10)</td>
<td>8 (range 0-10)</td>
<td>Mann Whitney U 126.5 *p=0.046</td>
</tr>
<tr>
<td>How confident do you feel interpreting the aEEG / cerebral function monitor?</td>
<td>6 (range 0-9)</td>
<td>2 (range 0-8)</td>
<td>6.5 (range 0-10)</td>
<td>Mann Whitney U 85.5 *p=0.003</td>
</tr>
</tbody>
</table>

\(^1\)Scores: 0=not at all confident; 5=somewhat confident; 10=completely confident.

\(^2\)Scores: 0=never; 5=half the time; 10=all the time.
Figure 1: Aspects of the neonatal neurological examination that trainees listed they performed routinely.