Journal Club / Research Article Summary - (Adapted from Schultz Table)

Date: 9/15/10
Presenter: Mike Roehlk

ARTICLE:
• Citation: Greenes D, Schutzman S. Clinical significance of scalp abnormalities in asymptomatic head-injured infants. Ped Em Care Vol 17, No 2, 88 – 92.
• Country: United States
• Funding Sources: Grant from David and Lucile Packard Foundation

PURPOSE:
• Research Question(s): 1) To identify clinical features indicating a high risk of skull fracture and associated intracranial injury (ICI) in asymptomatic head-injured infants. 2) Develop a head imaging clinical decision rule

• Hypothesis: Not formally stated but assuming that all intracranial injury are associated with skull fractures, signs indicative of skull fracture are an important risk factor for ICI.

DESIGN:
• Study Design: prospective cohort study

• Outcomes: total head imaging, total skull fractures as confirmed by radiograph and/or head CT, and ICI based on cerebral contusion, cerebral edema, or intracranial hemorrhage.

SUBJECTS:
• Subjects:
  o Number of Studies / Subjects: 608 enrolled, 422 after exclusion
  o Inclusion / Exclusion criteria:
    • Included: all patients < 2yo seen in ED for head trauma
    • Excluded: symptomatic (loc, lethargy or irritability, seizures, emesis > 2, irritable or AMS on exam, bulging fontanel, abnormal vital signs, or focal neuro deficits) or palpable depression or sign of basilar skull fracture.
  o Demographics: as above, none others stated
METHODS:

- **Interventions:** Head CT or skull radiographs obtained at discretion of treating physician. Encouraged to follow guidelines previously published by the same group (pg 89)

- **Variables:** Imaging vs. no imaging, age, hematoma size and location, and injury vs. no injury.

- **Instruments:** Data sheet filled out by ED physician depicting size and location of scalp hematoma.

DATA ANALYSIS:

- **Statistics Used:** Chi-square and odds ratios for relationship of clinical predictors and outcomes. Logistic regression analysis used to determine variables that would predict skull fracture.

- **What, if any, confounding variables were controlled for / adjusted for:** none stated

RESULTS:

- **Clinical Scoring System (eg: SCALP Score):**

<table>
<thead>
<tr>
<th>Risk Points</th>
<th>Age</th>
<th>Hematoma Size</th>
<th>Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>&gt;12 Mos</td>
<td>None</td>
<td>Frontal</td>
</tr>
<tr>
<td>1</td>
<td>6-11 mos</td>
<td>Small (barely palpable)</td>
<td>Occipital</td>
</tr>
<tr>
<td>2</td>
<td>3-5 mos</td>
<td>Medium</td>
<td>Temporal / Parietal</td>
</tr>
<tr>
<td>3</td>
<td>0-2 mos</td>
<td>Large (boggy)</td>
<td></td>
</tr>
</tbody>
</table>

- **Brief answers to research questions:** If a cutoff score of imaging every patient with 3 points or more is used, the study’s clinical decision rule scoring system would have a 98% sensitivity and 49% specificity for detecting skull fracture, which has been shown previously to be a very strong predictor of intracranial injury.

- **Limitations:** Very low incidence of ICI in the study population makes it difficult to draw significant conclusions to the population at large. There was only a weak association found between age and SF risk despite other studies to the contrary. Selection bias of younger patients receiving more imaging. Recall bias when clinicians asked to fill out form after some SF or ICI found on patients with no complaint. Clinical prediction rule validated on same study population as it was conceived on (internal). Needs external validation.

IMPLICATIONS FOR PRACTICE:

- **Applicable to this clinical practice:** yes

- **Feasibility (cost, resources, etc):** likely not much change, very feasible
• \textit{Clinically Relevant}: absolutely

**LEVEL OF EVIDENCE / DECISION FOR USE**: consider replication

• Background \underline{Consider Replication} \hspace{0.5cm} Ready for use

• \textit{Level of Evidence}: IIa
  
  Ia  \hspace{0.5cm} Evidence obtained from meta-analysis of randomized controlled trials
  
  Ib  \hspace{0.5cm} Evidence obtained from at least one RCT
  
  IIa  \hspace{0.5cm} Evidence obtained from at least one well-designed controlled study without randomization
  
  IIb  \hspace{0.5cm} Evidence obtained from at least one other type of well-designed quasi-experimental study
  
  III  \hspace{0.5cm} Well-designed non-experimental studies
  
  IV  \hspace{0.5cm} Expert committee reports, opinions of experts