Reviewer's report

Title: Head CT is of limited diagnostic value in critically ill patients who remain unresponsive after discontinuation of sedation

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Reviewer: John Kress

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PEER REVIEW: Head CT is of limited diagnostic value in critically ill patients who remain unresponsive after discontinuation of sedation

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SUMMARY

The authors present a cross-sectional study of patients receiving head CT for failure to regain consciousness within 48 hours of sedative medication discontinuation after > 72 hours of mechanical ventilation. The primary endpoint of interest was the diagnostic utility of the head CT, but other presented data include demographic data, type of sedation, the presence of daily interruption of sedation, and the findings on the head CT. This study was performed as a retrospective chart review, and no control group was identified for comparison.

During the one-year study period, the investigators found that 308 patients were intubated for > 72 hours. Of those, 42 patients remained unresponsive 48 hours after discontinuation of sedative and thus underwent head CT. All of these patients were intubated for > 7 days, and the mean duration of intubation was 12.7 days (SD 4.3 days). All patients were on continuous infusion of a benzodiazepine for sedation. The mean time to head CT was 2.2 days (SD 1.2 days). Only one head CT (2%) demonstrated an acute diagnostic abnormality that could plausibly explain the patient’s clinical status. Consciousness returned in 37 of the 42 patients (88%) in a mean 4.4 days (SD 2.3 days). The remaining 5 patients required continued mechanical ventilation or never regained
consciousness. The authors note that the majority of the patients had not received a daily interruption of sedation, although the data in the manuscript are inconsistent (see below).

MAJOR COMMENTS

1. This study provides validation for the limited role of head CT in this patient population as suggested by the work of Rafanan et al. and Kress et al. Some direct comparison is made to the Kress et al. manuscript, and it is noted that the utility of head CT in this study is even lower, but there is no discussion as to why this may be the case (population, exclusion criteria, etc.).

2. The authors state that a minority of enrolled patients undergoing head CT (8 of 42, or 19%) had a daily interruption of sedation (page 7 text and Table 4). However, different numbers are presented in Table 2 (20 of 42, or 47%), and the text on pages 8-9 suggests a third proportion (30%). Obviously, corrections are necessary to ensure accurate presentation of the data. Assuming that the data demonstrate that the majority of patients undergoing CT have NOT had a daily interruption of sedation, this observation could further support the conclusions by Kress et al. that daily interruption of sedation limits utilization of such tests. However, this assertion would necessitate knowledge of the proportion of patients receiving/not receiving a daily interruption of sedation in this ICU population as a whole.

3. As a continuation of point # 2, many important questions are described but cannot be asked due to the limited study design. An alternative study design, such as a case-control study with a carefully selected control group (prolonged intubation with quick return to consciousness), could provide further insight. This alternative design may make it possible to evaluate the impact of sedation interruption, sedative agent, route of sedative administration, etc.

MINOR COMMENTS

1. Table 2 and Table 4 both report the “Type of sedation” and “Daily interruption of sedation”, although the former heading is missing data in Table 2 and the latter heading reports inconsistent data across the two tables.

2. The data are described with mean and standard deviation. The endpoints described, however, are often skewed, and the sample size here is relatively small. Mean and standard deviation are appropriate if the distribution has been demonstrated to be normal, but this data may be better described with median and interquartile ranges. At the very least, the authors must report whether the data were normally distributed or not.

Level of interest: An article whose findings are important to those with closely related research interests

Quality of written English: Acceptable

Statistical review: No, the manuscript does not need to be seen by a statistician.
Declaration of competing interests:

We declare that we have no competing interests.

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