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Sanjeev Ramachandran*
Robert William Foley

Cambridge University Hospitals NHS Foundation Trust, United Kingdom

*Corresponding author.

E-mail address: sanjeevramachandran.sr@gmail.com (S. Ramachandran).

Harish Venkatesh

Royal Berkshire NHS Foundation Trust, United Kingdom

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Can the Ottawa Subarachnoid Haemorrhage Rule help reduce investigation rates for suspected subarachnoid haemorrhage?



The Ottawa Subarachnoid Haemorrhage (SAH) Rule is a clinical decision tool to facilitate identification of subarachnoid haemorrhage in alert, neurologically intact adults admitted to the Emergency Department (ED) with acute non-traumatic headache. It was developed by Perry et al. on the basis of data derived from a multicentre cohort study in Canada [1]. It takes into account clinical features that were deemed high risk for SAH, including age ≥ 40 , neck pain/stiffness, witnessed loss of consciousness, onset during exertion, thunderclap headache and limited neck flexion on examination. It had been originally purported that the tool had the potential to reduce investigation rates by approximately 10–20% [2]. We performed an up-to-date review of the literature and present a summary of the current evidence base for the validity and usefulness of the Ottawa SAH Rule.

From 66 unique citations identified using our search strategy, we found four relevant articles [3–6]. Across a total of 3317 patients enrolled from four countries in these studies, the Ottawa SAH rule had not missed a single case of SAH, with a pooled sensitivity of 100%. Employing the rule correctly may have the advantage of reducing the investigation rate for patients, in turn reducing radiation exposure from computed tomography (CT) scanning and avoiding invasive tests such as lumbar puncture. In addition, the rule may provide a cost-effective screening tool for physicians in resource-constrained or remote healthcare facilities when formulating decisions for transferring patients to suitable centres for further work up. The strength of the current evidence base is that it includes two large multicentre prospective cohort studies externally validating the rule [4,5].

However, there appear to be a number of other factors which limits the use of the Ottawa SAH score. Most importantly, its specificity has been shown to be universally poor, with point estimates ranging from 7.6% [3] to 13.6% [5]. Physicians should be cautious not to investigate patients merely because they demonstrate one or more high risk features; in these circumstances, the score should act as a prompt to apply clinical judgement more keenly in formulating a clinical diagnosis of SAH. Secondly, the actual or potential reduction in investigation rate has been shown to be relatively modest at 4.7% by both Perry et al. [5] and Chu et al. [6]. Furthermore, Bellolio et al. suggest that the rule can only be applied to a small proportion (9%) of the ED cohort [3]. Nevertheless, given the substantial rise in CT imaging rates in recent years [7], even modest reductions may accrue benefits for healthcare institutions. Thirdly, interobserver variability may limit the reliability of the tool. This has, however, been addressed by Perry et al. who have demonstrated excellent interobserver reproducibility [5]. Whilst it is true that this may be partly confounded by the fact that they enrolled the same centres as from the original derivative study, this may highlight the role of education and training in maintaining adequate interobserver reliability.

To conclude, it appears that based on the current literature, the Ottawa SAH rule is a reliable clinical decision tool in excluding SAH and can avoid unnecessary investigations in a small, select proportion of patients. It is limited by a poor specificity and clinical judgement must be applied in managing patients who demonstrate one or more high risk features from the rule.

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Does the use of steps decrease the quality of cardiopulmonary resuscitation when children as rescuers perform chest compression?



Dear editor,

I have read the article by Otero-Agra et al. titled “What biomechanical factors are more important in compression depth for children life-savers? A randomized crossover study” with great interest [1]. Although the study results showed that the use of steps did not increase cardiopulmonary resuscitation (CPR) quality, I have several concerns about the study conclusion, and will share these with the authors and readers of the journal.

I think that the authors designed this study to verify whether the use of steps could increase the quality of CPR during chest compressions delivered by children as rescuers. This issue is important to basic life support because CPR delivered by children is of lower quality than that provided by adult rescuers, as noted by the authors. The positive effect of using steps on CPR quality is based on the height difference between the patient and the rescuer [2–4]. Most CPR training is conducted on the floor in a kneeling position beside a manikin because CPR guidelines describe the standard position for CPR as a kneeling position beside the patient on the floor. Changes in position between the patient and rescuer caused deterioration of CPR quality in previous studies [5–7]. Interestingly, this deterioration disappeared when the bed height was adjusted to the knee height of the rescuer, because adjusting the bed height to knee height enables the rescuer to assume a position similar to that of standard position for CPR [8]. Therefore, the current hypothesis on the