Reviewer's report

Title: Does applying the Canadian Cervical Spine rule reduce cervical spine radiography rates in alert patients with blunt trauma to the neck? A retrospective analysis.

Version: 1 Date: 7 January 2008

Reviewer: Anne-Maree Kelly

Reviewer's report:

Thankyou for asking me to review this paper. It is a retrospective medical record study of 114 patients with potential neck injury undertaken at 2 hospitals. The stated aims were:
1. to determine if applying the Canadian C spine rule would reduce xray ordering
2. to see if significant injuries would have been missed.

There are a few serious problems with this manuscript.
1. the sample size is very small
2. there is significant selection bias in the sample studied
3. retrospective data collection when assessing a rule that is reliant on accurate data
4. I strongly suspect that incorrect assumptions about the application of the CCR and risk groups have been made. This may well be a fatal flaw.

The latter is a major issue and would need to be satisfactorily addressed before acceptance for publication.

Background:
1. The authors assert that C spine xrays are applied liberally to patients with potential injuries. While this may be true in the USA, it is generally considered that the UK is more selective in its use of xrays. I am not sure that the liberal use in North America can be assumed in the UK. [Discretionary]
2. There are some typos in paragraph 2 and inappropriate use of a digit rather than a text number. [Minor Essential]

Methods:
1. A retrospective cohort study is a poor method for addressing the study's questions. The problems with documentation [in particular omissions] make it very difficult to assess the data against a rule like the CCR which has very clear definitions of its terms. Please justify [Major compulsory]
2. There is significant selection bias in the participant population chosen for study. The UK is generally thought to have a more selective use of imaging than those in north America, so it may well be that those xrayed had other
undocumented reasons for xray ordering. Please justify. [Major compulsory]

3. How was data extracted? A single abstractor? Were they blinded to the study hypothesis? Was inter-rater agreement in data abstraction tested? [Minor essential]

4. Who assessed the xrays? Were they blinded as well? [Minor essential]

5. It is highly likely that there was a lot of missing data. How was this handled? Was it assumed that missing was negative/normal? [Major compulsory]

6. The description of the methods does not convince me that the CCR was applied as it was intended: in 3 steps [identification of any high risk feature, identification of any low risk feature and neck movement assessment]. I am left with the impression that the authors have assumed that all non-high risk patients are low risk and this is definitely not the case. If this is the way the rule has been applied, this is a major study flaw and invalidates the findings. Please address. [Major compulsory]

7. How was sample size determined? In particular, the secondary objective about not missing fractures cannot possibly be robustly tested with a sample size of 114. [Minor essential]

Results:
1. The first paragraph of results further raises concerns about invalid assumptions in application of the CCR.

2. Without robust data about steps 2 and 3 of the CCR assessment, the reported reduction in xray rates is inappropriate.

3. The tables do not quite line up with the CCR definitions. This should be addressed. [Major compulsory]

Discussion:
1. There is unnecessary repetition. [Minor essential]

2. The limitations of the study are not adequately discussed, especially the issues of missing data and lack of generalisability. [Major compulsory]

3. There is no discussion regarding comparison of this study’s reduction in xray rate [absolute reduction ~75%] versus the prospective trials estimates of 15-25%. I suspect that this lies in invalid assumptions in application of the CCR. [Major compulsory]

What next?: Unable to decide on acceptance or rejection until the authors have responded to the major compulsory revisions

Level of interest: An article of limited interest

Quality of written English: Acceptable

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

I have published research in a similar area.