Cost-effectiveness of MRI to Assess for Posttraumatic Ligamentous Cervical Spine Injury

To the Editor:

We would like to thank Murphy et al1 for their article entitled “Cost-effectiveness of MRI to Assess for Posttraumatic Ligamentous Cervical Spine Injury.” There has been much controversy in the literature regarding the utility of magnetic resonance imaging (MRI) for patients with cervical spine (CS) trauma but normal findings on initial work-up. This article is a timely effort to address this issue from both the cost and the effectiveness perspectives, and is very relevant to clinical decision-making.

The authors performed a cost analysis on patients who underwent MRI and those who were placed in a cervical collar after normal findings on radiograph. On comparing the respective costs, the authors concluded that MRI would be less costly after taking opportunity cost into consideration. We have carefully reviewed the article and would like to raise a few concerns.

All of the patients with CS trauma included in the study had a radiograph at initial examination and results were negative. The comparison was made between MRI and plain radiographs, but the sensitivity of radiographs in detecting fractures and ligamentous injury is questionable. Multiple studies have reported limited clinical value of radiographs for patients with CS trauma.2,3 Mathen et al6 even reported a missed fracture rate as high as 55.5%. To our knowledge, computed tomography is now being used as the modality of choice in initial evaluation of CS injuries and is recommended by the Eastern Association for the Surgery of Trauma guidelines.4 When computed tomography results are negative in non-obtunded patients, MRI has been found to be unhelpful in multiple studies.5 Thus, the recommendation of MRI based on radiograph performance is an unfair comparison.

The cost analysis in the MRI group included only costs from MRIs, radiographs, and emergency visits. The authors did not consider the possibility of MRI being falsely positive and resulting in additional treatment. If signal changes on MRI are detected, patients might be placed in collars or even undergo surgical fixation, which should be factored into the cost of the MRI group. The false-positive rate for soft tissue injury on MRI vs intraoperative correlation has been shown to be as high as 25% to 40%.6,7 In addition, due to the high sensitivity of MRI, findings not caused by CS trauma, such as degenerative changes, might be detected and come with additional costs. For instance, Adams et al8 reported 12 degenerative changes in 97 patients with MRI. We feel that the aspects cited above, not to mention the issue of overdiagnosis, should be taken into consideration to make the cost analysis more comprehensive. The authors did mention the lack of MRI availability. Magnetic resonance imaging may also have associated risks of complications, which can potentially result in additional costs.

Furthermore, the authors defined the article as a cost-effectiveness analysis; however, we could not find specific discussion of effectiveness or patient utility in the article. The World Health Organization published a guide to cost-effectiveness analysis, and clearly defined cost-effectiveness analysis to have both costs and effectiveness (health benefits).9 The absence of consideration of patient utility renders MRI to be a potentially economical, rather than cost-effective, option.

We appreciate the authors’ effort addressing this long-standing clinical dilemma, but more comprehensive consideration may be needed to justify the conclusion.

Xiao Wu, BS
Vivek B. Kalra, MD
Howard P. Forman, MD, MBA
Ajay Malhotra, MD
New Haven, Connecticut

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REFERENCES