

ABSTRACT

Changes in Physical Examination Caused by Use of Spinal Immobilization

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The standard of care for patients following blunt trauma includes midline palpation of vertebrae to rule out fractures. Previous studies have demonstrated that spinal immobilization does cause discomfort.

- Objective:** To determine whether spinal immobilization causes changes in physical exam findings over time.
- Methods:** This was a single-blinded, prospective study at a tertiary care university teaching hospital. Twenty healthy volunteers without previous back pain or injuries, 13 male and seven female, were fully immobilized for one hour, with a cervical collar and strapped to a long wooden backboard. Midline palpation of vertebrae to illicit pain was performed at 10-minute intervals. In addition, the participants were asked to rate neck and back pain on a scale from 1 to 10 (1 for no pain, and 10 for unbearable pain), to see whether subjective pain from immobilization correlated with tenderness to palpation.
- Results:** Three patients had point tenderness of cervical vertebrae within 40 minutes. Five patients developed point tenderness of vertebrae by 60 minutes. Eighteen of 20 participants complained of increasing discomfort over time. The median initial pain scale was 1 (range 1-1), in contrast to 4 (range 1-9) at 60 minutes, $p < 0.05$.
- Conclusion:** This study shows that over time, standard immobilization causes a false-positive exam for midline vertebral tenderness. In order to reduce this high false-positive rate for midline vertebral tenderness, the authors recommend that, initially on arrival to the emergency department, immediate evaluation occur of all immobilized patients. Furthermore, backboards should be modified to reduce patient discomfort to prevent the iatrogenically induced midline vertebral tenderness, thereby reducing subsequent false-positive examinations. Key words: physical examination; spinal immobilization; vertebral tenderness.

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