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Research Paper Review

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Risk of Traumatic Injury Associated with Chiropractic Spinal Manipulation in Medicare Beneficiaries Ages 66 to 99

Research Review By Dr. Michael Haneline©

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Study Title:
Risk of Traumatic Injury Associated With Chiropractic Spinal Manipulation in Medicare Part B Beneficiaries Aged 66 to 99 Years

Authors:
Whedon J, Mackenzie T, Phillips R, Lurie J

Author's Affiliations:
Dartmouth Institute for Health Policy and Clinical Practice, New Hampshire, USA.

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Background Information:
Because physical forces are applied during spinal manipulation (SM), there is a potential for injury, although the degree of associated risk remains uncertain.

Older adults are generally more vulnerable to traumatic injury than their younger counterparts, yet the risk of injury following SM has not been thoroughly evaluated for that population.

Serious adverse events associated with chiropractic care are thought to be very rare, although systematic reviews have reported varying rates of occurrence. Clinical trials have not been able to effectively assess the risk of SM because studies often have not reported adverse effects, their duration was too short, or the studies involved so few subjects that there was insufficient power to assess the risk of serious adverse effects. In spite of these unknowns, however, the benefits of chiropractic care are thought to outweigh the risks (1).

The purpose of this study was to analyze Medicare claims to evaluate for risk of injury to the head, neck, or trunk in older adults. In addition, the authors sought to examine the association between such injuries and chronic conditions that have been identified by the Centers for Medicare and Medicaid Services (CMS) as contraindications to SM. The risk of

injury within 7 days following care was compared between 2 cohorts of patients treated by chiropractic SM versus treatment by a primary care physician.

Pertinent Results:

- There were 40 injury incidents per 100,000 subjects in the chiropractic cohort compared with 153 incidents per 100,000 subjects in the primary care cohort. This represents an adjusted risk of injury in the chiropractic cohort that was 76% lower than the primary care cohort (hazard ratio: 0.24; 95% confidence interval: 0.23–0.25).
- The likelihood of injury was increased for patients who saw a chiropractic physician and had a chronic coagulation defect, inflammatory spondylopathy, osteoporosis, aortic aneurysm or dissection, or long-term use of anticoagulant therapy.
- There were more than 5 times as many patients in the primary care cohort than in the chiropractic cohort (n = 5 669 032 and n = 1 000 571 respectively), though the difference in the number of office visits between primary care and chiropractic care was less prominent (13 536 595 and 10 532 213 respectively).
- There were baseline differences between the cohorts given that the chiropractic cohort was younger, mostly Caucasian and female, healthier (i.e. fewer comorbidities), and had a lower proportion of subjects with chronic conditions.

Clinical Application & Conclusions:

The reader should be aware that older patients with neuromusculoskeletal (NMS) problems who receive chiropractic SM are probably less likely to experience an injury to the head, neck, or trunk within 7 days following treatment than those from the same population who receive care from a primary care physician.

The likelihood of injury may be increased in older patients who receive chiropractic SM if they have one of the following comorbidities: chronic coagulation defect, inflammatory spondylopathy, osteoporosis, aortic aneurysm and dissection, or long-term use of anticoagulant therapy.

Study Methods:

This was a retrospective cohort study that used Medicare administrative data which included all beneficiaries covered under the Medicare B fee for service plan who were 66 to 99 years-of-age. Included patients had to have experienced an office visit for the evaluation and/or care of neuromusculoskeletal (NMS) complaints.

The **chiropractic cohort** was comprised of beneficiaries who had at least 1 allowed Medicare B claim for a chiropractic office visit that included SM. Clinical Procedural Terminology (CPT) codes 98940, 98941, or 98942 with the provider specialty code for chiropractic physicians were included.

The **primary care cohort** included beneficiaries with at least 1 allowed Medicare B claim for an office visit for evaluation and management that was associated with the provider specialty code for family medicine, internal medicine, or general practice.

Subjects were excluded if they had a history or current diagnosis of injury to head, neck, or trunk at the index office visit, because if patients had an injury at the time of the office visit, they likely sustained the injury before seeing the doctor, in which case the injury could not have been caused by the office visit.

Chronic conditions that CMS has classified as being contraindications to SM were identified along with various comorbidities in order to calculate Charlson comorbidity scores for risk adjustment.

The number of days to the diagnosis of injury was evaluated for each office visit until 7 days had transpired, a subsequent visit occurred, or the study ended. Thus, the period for identifying outcomes (i.e. the hazard period) was a 7-day window following exposure to each office visit for an NMS problem.

The study's primary outcome measure was the diagnosis of an injury to the head, neck, or trunk within 7 days of the office visit. The injury had to be diagnosed in an emergency department or as the primary diagnosis associated with a hospital admission.

Chiropractic visits and primary care visits were compared for hazard of injury within 7 days of an office visit, taking into consideration subjects' age, sex, race, and Charlson comorbidity index.

Study Strengths / Weaknesses:

Even though there was a lower risk of injury in the chiropractic cohort, this does not necessarily mean that chiropractic care is *protective* against injury in older adults. Due to the limitations of the observational research design that was employed in this study, the estimates of risk that were presented may merely represent a coincidence of injury, without any causal relationships.

The authors compared the results of this study with a study by Gouveia et al (2); however, the objectives of the two studies were so different that the comparison is unconvincing. Gouveia et al. reported on serious adverse events associated with SM, whereas the current study reported on any kind of injury that occurred within a week following a visit to a chiropractor versus medical physician. The current study reported a much higher rate of injury than Gouveia et al., which might be misinterpreted as higher adverse effect rates in other reports.

The difference in risk between the cohorts may have been a result of inadequate control for an older and sicker population in the primary care cohort, as well as the much larger size of the primary care cohort.

A diagnosis of an injury to the head, neck, or trunk within 7 days of an office visit does not necessarily mean the injury was related to the visit. A completely separate injury-causing incident could have occurred. Moreover, a study of injured patients who were admitted to an emergency department reported an annual injury rate of 57 per 1,000 among persons 60 or more years-of-age in Sweden (3). This rate would be equivalent to approximately 110 injuries per 100,000 persons in a 7 day period, which is not very different from what was reported in the current study.

Additional References:

1. Rubinstein SM . Adverse events following chiropractic care for subjects with neck or low back pain: do the benefits outweigh the risks. J Manipulative Physiol Ther 2008; 31: 461-4.
2. Gouveia L, Castanho P, Ferreira J. Safety of chiropractic interventions: a systematic review. Spine 2009; 34: E405-13.

3. Sjögren H1, Björnstig U. Unintentional injuries among elderly people: incidence, causes, severity, and costs. Accid Anal Prev 1989; 21: 233-42.