The association between exposure to a rear-end collision and future health complaints

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FROM ABSTRACT

Different symptoms, together with neck pain, have been attributed to persons with persistent complaints after a previous motor vehicle crash (MVC) and are sometimes referred to as the “late whiplash syndrome.”

A cohort study was conducted to determine whether exposure to a rear-end collision, with or without whiplash injury, is associated with future health complaints.

The results regarding future neck or shoulder pain have previously been described, and the objective of the present report was to focus on outcomes other than neck pain.

Included in the study were persons 18 to 65 years of age and covered by traffic insurance at one of the largest insurance companies in Sweden.

Drivers exposed to a rear-end collision were divided into two subgroups: those with reported whiplash injury (n 232) and those without reported whiplash injury (n 204).

For comparison, 3,688 subjects who were unexposed to MVCs were selected, with consideration taken to the age and gender distribution in the exposed subgroups.

The prevalence of different health complaints among the study subjects was estimated according to a mailed questionnaire at follow-up in 1994, 7 years after the rear-end collision.

When exposed subjects with whiplash injury were compared to unexposed subjects, increased relative risks in the range of 1.6–3.7 were seen for headache, thoracic and low back pain, as well as for fatigue, sleep disturbances and ill health.

No corresponding increased risks were found among the exposed subjects without reported whiplash injury.
We conclude that rear-end collisions resulting in reported whiplash injuries seem to have a substantial impact on health complaints, even a long time after the collision.

There is a need to identify factors that predict a non-favorable outcome in order to improve clinical management.

THESE AUTHORS ALSO NOTE:

INTRODUCTION

Soft-tissue injuries of the cervical spine from whiplash injuries commonly only have subjective complaints, not objective finding.

Typical symptoms are:
(1) Neck pain
(2) Headache
(3) Back pain
(4) Fatigue
(5) Sleep disturbances

Persistent whiplash symptoms is sometimes referred to as the “late whiplash syndrome.”

The objective of the present report was to determine whether exposure to a rear-end collision, with or without whiplash injury, is associated with future health complaints, besides neck pain.

This is a cohort study.

[The Randomized Controlled Trials is the “gold standard” by which other studies are usually judged: half of a group of volunteers is randomly assigned to the treatment, and the other half is not. After a preset time, the number of people in the control group who have developed the predetermined “endpoint” is compared with the number in the treatment group.]

[Cohort Studies are the next best method. They involve following what epidemiologists call “free living humans” with something in common {like been in a motor vehicle accident} for a period of time. During the follow period, the group is assessed with examinations or questionnaires or both. Researchers accumulate the information and form conclusions or hypotheses.]
Included were 4,124 subjects from Sweden who were classified according to the 1985 Abbreviated Injury Scale (AIS), where:
(1) specifies a minor injury
(6) specifies a maximum injury

This study used three subgroups:
(1) exposed to an accident, but without whiplash injury
(2) exposed to an accident and injured
(3) for comparison, a group unexposed to MVCs

Group 1:
204 drivers who had been involved in a rear-end collision but were uninjured.

Group 2:
272 drivers who had been exposed to a rear-end collision and had reported bodily injury.
4 subjects were coded as having a moderate injury (AIS 2).
1 subject was coded as having a serious injury (AIS 3).
The others were classified as having minor injuries (AIS 1).

68% of these subjects reported a neck whiplash injury alone.
32% of these subjects also reported other injuries, mostly to the lumbar spine.
The second most common other injury was an injury to the skull/brain.

Group 3:
3,688 unexposed subjects were the comparison group.

METHODS

A mailed questionnaire concerning overall health complaints was sent to all the study subjects, and to avoid biased answers the rear-end collision under study was not referred to.

The questionnaire concerned general health, fatigue, depressive mode, sleep disturbance, headache, pain or ache in the neck or shoulder, thoracic spine pain, low back area and stomach pain during the preceding 3 months.

Possible response alternatives on general health were “good,” “acceptable,” “not too good” and “poor.” The four response alternatives on the other eight health complaints asked about were “never,” “occasionally,” ”often” and “always.”
“In the exposed group with whiplash injury the relative risks were increased for headache, thoracic and low back pain, as well as for fatigue, sleep disturbances and ill health, but not for stomachache and depressive mode.”

“For subjects without whiplash injury the relative risks were not increased regarding any of the studied outcomes.”

<table>
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<tr>
<th>COMPLAINT</th>
<th>% INJURY GR.</th>
<th>% NON-INJURY GR.</th>
<th>% CONTROL GR.</th>
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<tr>
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<td>SLEEP DISTURBANCE</td>
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<td>4.4</td>
<td>5.6</td>
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<td>DEPRESSION</td>
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</table>

DISCUSSION

“According to the results in the present report there was no association between exposure to a rear-end collision and any of the eight outcomes studied, if whiplash injury had not been reported in connection with a rear-end collision 7 years earlier.”

“When, on the other hand, exposed subjects with reported whiplash injury were compared to unexposed comparison subjects, increased risks were seen for headache, thoracic and low back pain, as well as for fatigue, sleep disturbances and ill health, but not for stomachache and depressive mode.”

“The relative risk of neck or shoulder pain at follow-up was 2.7 in exposed subjects with reported whiplash injury compared with unexposed subjects.”

The authors suggest that it is inappropriate to consider the long-term consequences due to whiplash injuries as a syndrome, because the symptoms and changes in the body’s function “show that a particular disease is present.”

The authors note that chronic symptoms continuing 6 months or more after a collision “are secondary to chronic pain,” and that “psychological distress resolved in all patients who became pain-free.”

The authors note that in whiplash injury, “it is possible that subjects with various health complaints prior to the rear-end collision are more vulnerable.”
This study used the perfectly valid 95% confidence-interval method. If this confidence-interval was raised to 99%, “all relationships were still significant, except for fatigue.”

Different health complaints are reported in the general population and in consequence it is necessary to include an unexposed comparison group when assessing persistent complaints after a motor vehicle crash.

“According to the present results, subjects who reported a whiplash injury in connection with a rear-end collision 7 years earlier not only had an increased risk of future neck pain, but also an increased risk of other health complaints compared with an unexposed group.”

“These additional complaints included headache, thoracic and low back pain as well as fatigue, sleep disturbances and ill health with relative risks in the order of 1.6–3.7.”

“We conclude that rear-end collisions resulting in reported whiplash injuries seem to have a substantial impact on health complaints even a long time after the collision.”

FROM DAN MURPHY
I believe the key points from this article are:

(1) Although neck injury is most common after whiplash, injuries to the low back and skull pain are also prevalent.

(2) Whiplash injury causes substantial long-term (7 years) complaints.

(3) Whiplash injury chronic complaints are systemic, involving the whole body, the viscera, and the brain.

(4) Psychological distress reported by whiplash injured patients is probably secondary to chronic somatic pain.

(5) Subjects with various health complaints prior to the rear-end collision are probably more vulnerable to injury and symptoms.

(6) Rear-end collisions resulting in whiplash injuries seem to have a substantial impact on health complaints a long time after the collision.