The Relation Between Initial Symptoms and Signs and the Prognosis of Whiplash

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BACKGROUND FROM DAN MURPHY:

It is important to know that ***"mean recovery"*** means the time at which 50% of the subjects were recovered, using the return to work and other stipulations mentioned under my comments below. It therefore also means that 50% of the subjects are ***not*** *yet recovered* (again using the "returned to work" and other stipulations under comments below).

This study was done in the province of Québec, Canada, which has a single insurance that covers all residents. The province's sole universal insurance system provides financial compensation to injured motor vehicle accident subjects, whether driver, passenger, or bystander, regardless of fault, *as long as the subject is unable to work*.

These authors formed a population-based cohort of all 2,627 individuals (with stipulations, noted below under my comments) who sustained a whiplash injury resulting from a motor vehicle crash in the province of Québec, Canada, in 1987, and followed these patients for 5 to 7 years:

1,743	66%	Quebec Grade I	"no signs or symptoms"
755	29%	Quebec Grade II	"musculoskeletal signs or symptoms"
129	5%	Quebec Grade III	"neurological signs or symptoms"

KEY POINTS FROM THIS ARTICLE:

1) Following whiplash injury, recovery prognosis is "variable and difficult to predict." Whiplash injury prognosis has "high variability and low predictability."

2) The median recovery time for the entire group was 32 days. This means that 50% of the entire group was recovered at 32 days.
[Sadly this number includes averaging in the uninjured Group I].

3) *Prior studies* have found these factors to be associated with delayed whiplash injury recovery:

- Finger paresthesia
- The presence of neck stiffness and muscle spasm
- Pain in the upper limbs and back

4) These authors make these references pertaining to whiplash prognosis:

- "27% still affected at 6 months"

[Radanov BP, di Stefaano G, Schnidrig A, Ballinari P (1991) Role of psychosocial stress in recovery from common whiplash. Lancet 338:712–715]

- "26% [still affected] at 1 year"

[Deans GT, McGalliard JN, Rutherford WH (1986) Incidence and duration of neck pain among patients injured in car events. BMJ 292:94–95]

- "44% [still affected] at 2 years"

[Hildingsson C, Toolanen G (1990); Outcome after soft-tissue injury of the cervical spine. A prospective study of 93 car-accident victims. Acta Orthop Scand 61:357–359]

- "7% still unable to return to work at 2 years"

[Hildingsson C, Toolanen G (1990); Outcome after soft-tissue injury of the cervical spine. A prospective study of 93 car-accident victims. Acta Orthop Scand 61:357–359]

5) In this study, the factors/signs/symptoms that were found to be independently associated with a slower recovery from whiplash injury were:

- Female gender (factor)
- Older than 60 years of age (factor)
- Neck pain on palpation (sign)
- Muscle pain (symptom)
- Headache (symptom)
- Pain or numbness radiating from the neck to the extremities (symptom)

6) Women older than 60 with ***any*** of the signs/symptoms (neck pain on palpation, muscle pain, headache, and/or pain or numbness radiating from the neck to the extremities), had a ***median recovery*** time of 262 days. **[This means that 50% of such women had not recovered at 262 days after being injured].**

- "The slowest recovery is for female subjects aged 60 with neck pain on palpation, muscle pain, and pain or numbness radiating from the neck to the arms or hands, or shoulders, as well as headache."

7) Males younger than 20 with none of the slow recovery signs/symptoms had a ***median recovery*** time of 17 days. **[This means that 50% of such young men had not recovered at 17 days after being injured].**

- "The fastest recovery is for male subjects aged 20 with none of these six signs or symptoms."

8) At 60 days, "only 19% of the slow recovery group will have recovered, while 77% of the fast recovery group will have recovered by that time."

9) In addition to the above, visual or ear/nose/throat (ENT) problems, anxiety or insomnia, dizziness or vertigo, and loss of consciousness were the least frequent symptoms. "Neurological signs or symptoms are the most predictive of a lower chance of recovery."

10) The outcome was the length of time the subject took to recover from the whiplash injury. This length of time could not be determined exactly, so the authors used a *proxy*:
"The amount of time taken off work by the whiplash subject, if the subject was employed, or the length of time during which the whiplash subject could not carry out his or her usual activities, if the subject was a student, homemaker, retired, or unemployed."

11) For the entire cohort, the median recovery time was 32 days. **[This means that 50% of the cohort was not recovered at 32 days, and as noted below there are some problems with the design of this assessment protocol].**

12) The most predictive signs and symptoms associated with a slower recovery were:
- Non-radiating paresthesia or numbness
- Anxiety or insomnia
- Pain or numbness radiating from neck to arms or hands

13) Using the Quebec Task Force Whiplash Classification:
66% of subjects were Grade I
29% were Grade II
only 5% were Quebec Grade III
[This is probably representative of what is seen in clinical practice]
"The rate of recovery, adjusted for age and gender, decreases with worsening grade." **[Important]** "The cumulative probability of recovery decreases with the grade."
- The ***median recovery time*** was 25 days for grade I
- The ***median recovery time*** was 54 days for grade II
- The ***median recovery time*** was 76 days for grade III

14) "One year after their crash, 4.8% of grade 3 subjects still had not recovered."
One year after their crash, 1.8% of grade 2 subjects had not recovered.

15) "Paresthesia, the presence of neck stiffness and muscle spasm, pain in the upper limbs and back, and the general presence of musculoskeletal or neurological signs were found to be associated with a delay in recovery."

16) "In conclusion, this study shows that whiplash patients presenting with neck pain on palpation, muscle pain, headache, pain or numbness radiating from neck to arms, hands or shoulders are expected to have a longer course of recovery."

COMMENTS FROM DAN MURPHY

In my view, there are problems with this study:

1) Literally, ***40%*** (1923/4766) of the subjects that made a claim to the insurance company in this study were eliminated because they *had injuries to body regions other than just the neck*. This suggests that 40% of the more injured (multiple body region injury) subjects were not included, giving the recovery numbers greater optimism.

This is a large study, looking at 4,766 injured subjects over the period of 1 year. As such, it suggests that about 40% of whiplash-injured patients have injuries to body regions in addition to neck injury. **[This is fairly consistent with clinical practice].**

2) The insurance company could and did close injury claims unilaterally. This would also give recovery numbers greater optimism.

3) Literally, 66% (1,743/2,627) of the subjects in this study were graded as Quebec WAD Grade I, meaning that they had *no signs or symptoms* of injury. The majority of these subjects were arbitrarily assigned a recovery time of 3.5 days. This would completely skew the recovery rate of the injured group towards greater optimism.

4) The length of time the subject took to recover from the whiplash injury was measured with a proxy: "days, between the date of the crash and the last date for which compensation was made to replace regular income." **This means that any person who was able to return to work was considered recovered.** This is bogus as there are many, many, whiplash-injured patients who are working but still suffering from injury signs and symptoms.

Despite these methodological shortcomings, only 50% of women older than 60 years, with certain sings/symptoms, were recovered at 262 days after being injured.