Development and validation of a prediction model to estimate the probability of post-traumatic headache 6 months after a motor vehicle collision in adults

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Rationale

How long will my headache last?

What will improve/delay my recovery?

Methods

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Design:

Secondary analyses of incidence cohort studies of adults injured in MVCs in Saskatchewan (development) and Sweden (validation)

Participants:

Dec. 1997 – Nov. 1999 (Saskatchewan, population-based, N=8,634)
Jan. 2004 – Jan. 2005 (Sweden, insurance claimants, N=1,946)

Included:

- Occupied motor vehicle
- Made injury claim or treated for injury within 30 d of MVC
- Reported "accident caused" average headache intensity ≥3 (NRS)

Methods (cont'd)

Excluded:
- Hospitalized >2 d
- LOC > 30 min

Outcome:

PTH at 6 months

"In the past week have you had headaches as a result of the accident?" "Please rate your headache pain." Reported headache intensity ≥3.

Analysis:

Logistic regression with backward elimination (p=.01) for removal

Key Findings

Participants:

Saskatchewan (development): N=4,162
Sweden (validation): N=379

- 64-68% female
- Median age 36-38 y

Outcomes:
PTH at 6 months: n=980 (32%) (Saskatchewan)
                  n=142 (47%) (Sweden)

Key Findings - Prediction Model

PTH	
Predictors	*P*-value
Age	<.0001
Health status	.0002
Prior headache	<.0001
Recovery expectations	<.0001
Symptoms in arms/hands	.0002
Midback pain	.001
Unusual fatigue	.0008
Work status	.0003
Severe PTH	<.0001
Face pain	.002
Dizziness	.005
Neck stiffness	.0003

Mix of biopsychosocial factors

C-statistic:
0.73, 95% CI 0.71-0.75

LOC, PTA not in model

Future Research

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1. Improve prediction of models
   - Assess additional participant characteristics (e.g., self-efficacy, lifestyle)
   - Different PTH outcome (e.g., impact, recovery)
2. Impact studies: *Better than clinical judgement?*
3. Decision rules:
   - Identify patients with low probability of recovery
     ➢ determine effective treatments
4. Assess PTH after other injury mechanisms
   ➢ Falls, sports concussion
5. PTH diagnostic classification

Conclusions

Implications

Clinical

- Preliminary evidence for patient management (modifiable predictors)
- Clinicians should assess <u>sociodemographic</u>, <u>injury</u>, <u>pre-injury</u>, and <u>comorbid</u> patient characteristics

Insurer

- Significant proportion of adults have unresolved injuries at 6 months
- Resource planning

Thank You

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