

Classification, care-seeking behaviour and pre-hospital triage of patients exposed to a whiplash trauma

Akademisk avhandling

Som för avläggande av medicine doktorsexamen vid Sahlgrenska akademien, Göteborgs universitet kommer att offentligen försvaras i hörsal Arvid Carlsson, Academicum på Medicinargatan 3, den 2 december 2019, klockan 09.00

av Artur Tenenbaum.

Fakultetsopponent:

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Avhandlingen baseras på följande delarbeten

- I. Tenenbaum A, Rivano-Fischer M, Tjell C, Edblom M, Sunnerhagen KS. The Quebec classification and a new Swedish classification for whiplash-associated disorders in relation to life satisfaction in patients at high risk of chronic functional impairment and disability. *J Rehabil Med.* 2002 May;34(3):114-8.
- II. Tenenbaum A, Nordeman L, Sunnerhagen KS, Gunnarsson R. Gender differences in care-seeking behavior and healthcare consumption immediately after whiplash trauma. *PLoS One.* 2017 Apr 25; 12(4):e0176328. doi: 10.1371/journal.pone.0176328. eCollection 2017.
- III. Tenenbaum A, Nordeman L, Sunnerhagen KS, Gunnarsson R: A risk stratification tool for prehospital triage of patients exposed to a whiplash trauma. *PLoS One.* 2019 May 14; 14(5):e0216694. doi: 10.1371/journal.pone.0216694. eCollection 2019.
- IV. Tenenbaum A, Nordeman L, Sunnerhagen KS, Gunnarsson R. Medical practitioners' recommendation for pre-hospital triage of patients exposed to a traffic accident resulting in neck pain. Manuscript.

**SAHLGRENKA AKADEMIN
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Abstract

Knowledge about the optimal first acute care level and classification after exposure to a whiplash trauma is important for the injured individual and for the healthcare system. Neck pain is ranked as the fourth most important condition in the “Global Burden of Disease Study”. Exposure to a whiplash trauma is common and many individuals seek health care. Up to 50% of those with symptoms after whiplash trauma, labelled whiplash associated disorders (WAD), face chronic health problems.

The general aim of this thesis was to explore allocation of rehabilitation resources after a whiplash trauma by investigating if a Swedish classification model could be used as a complement to the Quebec Classification. Furthermore, to study gender differences in care-seeking behavior immediately after whiplash trauma. A subsequent goal was to develop a risk stratification model for individuals exposed to whiplash trauma, a practical tool for medical personnel in prehospital triage after a neck trauma that results in neck pain. A prospective study was performed on 85 patients with WAD classified according to a new proposed classification system. Ten years of data from a database of injuries with more than 3000 patients exposed to a whiplash trauma were used to construct an algorithm recommending the appropriate first level of care. Finally, a survey to 188 medical practitioners exploring their recommendations for pre-hospital triage of patients exposed to a traffic accident resulting in neck pain. Patients with whiplash-associated disorders grade II and neuropsychological symptoms seem to have a worse prognosis for spontaneous recovery than those without. A Swedish classification system seems to be a complement to the Quebec classification. Women sought healthcare later than men after a whiplash trauma who sought hospital emergency department more often than women. Half of all individuals sought care at a hospital where only 6.4 % were hospitalized, while the other half sought care at a primary health care centre. Four risk factors were identified in patients diagnosed with WAD to predict the presence of a potentially sinister injury requiring hospital care; commotio cerebri, fracture or luxation, serious injury, and attending health care the same day as trauma. An algorithm recommending the appropriate first level of care was made. A consensus around initial pre-hospital triage of patients with a very low or very high risk for sinister injury exist. This consensus correlates well to recent findings recommending appropriate pre-hospital triage and first level of care.

Conclusion: The right level of care and classification after whiplash trauma is important for the injured individual and for the healthcare system.

Keywords: Whiplash, WAD, pre-hospital triage, medical decision-making, clinical decisions.