

## **Can long term impairment in general practitioner whiplash patients be predicted using screening and patient-reported outcomes?**

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### **ABSTRACT** (141)

The objective of this prospective pilot study was to investigate the predictors of outcome at six months for whiplash associated disorder in a general practitioner primary care population. Psychosocial screening questionnaires, patient-reported outcomes of cervical functional impairment, demographic and accident-specific data have been indicated as predictive of future recovery status and treatment requirements. Participants (n=30, age=37+/-14, 77% female) from eight general practitioner had recovery status monitored and classified for six months using patient-reported outcomes, both quantitatively (Neck Disability Index), and qualitatively (patient status self-classification). Analysis at two separate cutoff levels showed 30% of participants nonrecovered and 17% with moderate/severe impairment. Non-recovery status and higher treatment was predicted by a 109-point screening score cut-off whilst moderate/severe impairment was predicted by including the presence of cervical rotation at impact. Initial cervical functional impairment status measured with the Neck Disability Index was sensitive but not specific for prediction. A larger population study investigating these protocols is warranted.

Keywords: prediction, screening, whiplash-associated disorder, patient-reported outcome

### **INTRODUCTION**

Psychosocial screening tools, such as the Generic Screening Tool (GST) and Orebro Musculoskeletal Pain Questionnaire (OMPQ) have been successfully used to predict disability outcome in low back pain {Linton, 2003 #368; Gabel, 2007 #1303} and general workers compensation musculoskeletal patient groups {Dunstan, 2005 #1207; Gabel, 2005 #1127}. Recent research on Whiplash Associated Disorder (WAD) has shown that the use of psychological testing tools for distress and acute post-traumatic stress in conjunction with sensory hypersensitivity and motor dysfunction can indicate patients at risk of persistent moderate/severe symptoms at six months post injury {Sterling, 2006 #1256}. Other research determines that prediction of severity and delayed recovery can be made based upon demographic data, initial levels of intensity, the presence of cervical rotation at impact and the type of accident {Sturzenegger, 1995 #1458; Suissa, 2003 #1067}.

The purpose of this research was to investigate in a pilot study whether long term functional impairment following a WAD could be predicted in a General Practitioner population using self administered patient report outcomes (PROs). Functional impairment was measured quantitatively using the Neck Disability Index (NDI) PRO and qualitatively from patient reported recovery status. The hypothesized predictors were the score on

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the psychosocial Generic Screening Tool (GST) {Gabel, 2007 #1303}, the presence of cervical rotation at impact, demographic details and the initial level of severity on the NDI.

## **METHOD**

### Participants

Participants with WAD (n=35, age 37+/-14, 77% female, 83% receiving physiotherapy treatment) were recruited and managed under the standard care procedures of eight GPs. Five patients withdrew from the study leaving n=30.

### Measures and Procedures

At initial assessment demographic data, the presence of cervical rotation at impact, psychosocial screening scores and baseline PROs were obtained. The screening was measured by the GST - a modified Orebro Musculoskeletal Pain Questionnaire that combines psychosocial yellow flag and physical impairment signs. The PROs were the NDI and patient reported recovery being a dichotomous self classification for recovery status (full/nearly versus not) and symptoms/impairment (none/mild versus moderate/severe). The PROs were repeated at one, three and six months. The NDI uses a 100 percent scale (0% being no impairment, 100% being worst possible). A dichotomous classification was used to indicate participant status using a combination of the original three categories defined by Vernon {, 1996 #1106} and validated by Sterling {, 2003 #856}. These were recovered ( $\leq 8\%$ ) versus non-recovered ( $> 8\%$ ) and moderate/severe ( $> 28\%$ ) versus non-severe ( $\leq 28\%$ ). Sensitivity and specificity with subsequent Likelihood Ratios were used to analyse the effectiveness of screening in predicting chronicity as determined by the NDI classification at six months and the patient reported classification status.

## **RESULTS**

Symptoms classification at 6 months found nine (30%) participants non-recovered on both quantitative and qualitative classification with moderate/severe impairment for five (17%) on quantitative and four (13%) on qualitative classification - 80% correlation. Demographic data gave the poorest prediction of non-recovery, however female classification was predictive. Employment status was not significant. For screening, a GST cut-off Score of  $\geq 109$  was 78% sensitive and 86% specific of non-recovery with a LR of 5.4. Combining GST  $\geq 109$  and cervical rotation at impact was 100% sensitive and 87% specific for moderate/severe impairment with a LR of 7.7.

The total treatments (physiotherapy) provided were 252, ranging from 0 to 22 at an average of 8.4 +/- 7.5. There was a statistically significant difference ( $p = 0.001$ ) between those classified as non-recovered (average

Target – Intl J of Rehab Research – Brief Research Report Drft #4 FMT of 15 treatments) and those who were classified as recovered (average of 8.2 treatments). There was a similar significant difference between those classified with moderate/severe impairment (average of 14.6 treatments) and those not severely impaired (average of 9 treatments). Using these average treatment values of  $\geq 15$  treatments and  $\leq 9$  treatment, the GST  $\geq 109$  cut-off was predictive being 80% sensitive and 90% specific of  $\geq 15$  treatments with a LR of 8.0 and 100% sensitive and 75% specific for being moderate/severely impaired with a LR of 4.0. Initial NDI score was 100% sensitive but only 40% specific for being moderate/severely impaired.

## DISCUSSION

This pilot study demonstrated that initial information at injury, specifically a GST cut-off score of  $\geq 109$  and the presence of 'cervical rotation at impact', are predictive of impairment at six months following a WAD injury. These baseline measures are also indicative of who will respectively be recovered or have moderate/severe impairment. The GST cut-off  $\geq 109$  was also indicative of who would require more treatment. Use of the combined GST  $>109$  and the presence of 'cervical rotation at impact' were strong indicators of the risk of not being recovered at six months post injury. By using a screening tool and determining the presence of rotation at injury, GPs would be able to have an early indication of patients who are at a higher risk of chronicity and increased treatment. This would facilitate appropriate early referral and management strategies to reduce the associated incidence and morbidity for WAD patients. A further larger population study is warranted.

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