Long-term follow-up of whiplash injuries reported to insurance companies: a cohort study on patient-reported outcomes and impact of financial compensation

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Received: 26 October 2017 / Accepted: 30 January 2018 / Published online: 10 February 2018
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Abstract

Purpose The long-term outcome of Whiplash-associated disorder (WADs) has been reported to be poor in populations from medical settings. However, no trials have investigated the long-term prognosis of patients from medico-legal environment. For this group, the “compensation hypothesis” suggests financial compensation being associated with worsened outcome. The aims of this study were to describe long-term (2–4 years) non-recovery rates in participants with WAD recruited from insurance companies and to investigate the association between self-reported non-recovery and financial compensation.

Methods 144 participants, reporting neck pain after a motor vehicle accident, were recruited from two major insurance companies in Sweden. Self-reported recovery was measured at 6 months and 2–4 years. Those who received financial compensation from an insurance company were compared with those who received no compensation.

Results The overall non-recovery rate after 2–4 years was 55.9% (66/118). In the non-compensated group, the non-recovery rate was 51.0% (25/49) and in the compensated group 73% (27/37) ($p = 0.039$). Adjusted OR was 4.33 (1.37–13.66). High level of pain at baseline was a strong predictor of non-recovery [OR 46 (4.7–446.0)]. However, no association was found between pain level at baseline and financial compensation.

Conclusions The non-recovery rate among patients making insurance claims is high, especially among those receiving financial compensation even if causal relationship cannot be determined based on this study. However, lack of association between baseline level of pain and compensation supports the compensation hypothesis.

Keywords Whiplash · Wad · Compensation · Insurance · Self-reported health

Introduction

Musculoskeletal injuries due to motor vehicle accidents, MVAs, can lead to long rehabilitation periods and an increased risk of permanent disability [1]. All persons injured in an MVA in Sweden have a legal right to economic compensation from their insurance company due to physical or mental suffering of a transient nature, as well as for economic losses [2]. The most common type of injury mechanism among patients suffering from an MVA is whiplash

trauma of the neck, which may lead to a range of symptoms and clinical manifestations commonly referred to as whiplash-associated disorders (WADs) [3]. WAD is also the most common injury in persons involved in financial claims on insurance companies [4].

The large variation in recovery rates after a whiplash trauma is thought to be partly due to the use of different definitions of “recovery” [5]. Both objectively measured, “constructed”, and patient-reported definitions have been used [6], but there is no conclusiveness about the best clinical value of the different measures. Qualitative data suggest, however, that measuring only symptom intensity is insufficient for describing recovery [7]. Self-reported perception of recovery has previously been shown to be an easily interpreted and valid outcome measure [8, 9] and is thought to reflect the multifactorial conception of health.

During the last decades, much effort has been made to find an association between financial compensation and

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patient-related outcomes in terms of disability after WADs. It has been suggested that involvement by the insurance company could affect the outcome [10, 11], but also that the compensation model [12] and the time from the MVA to claim closure play a significant role [13]. The “compensation hypothesis” suggests that the outcome is worse if financial compensation is given [14]. Although many patients report their WAD to an insurance company, it is still unclear if compensation affects the long-term outcome [15, 16]. In several studies where this association has been shown, little or no consideration has been given to the possibility of reverse causality [15], i.e., if the claimants who received financial compensation had a worse outcome rather than if those with a worse outcome after an MVA were more likely to be financially compensated. There have been academic requests for this type of research [15].

Although WAD is still often thought of as a benign injury, long-term pain and disability are common. We have previously shown that 70% of patients with a WAD recruited via insurance companies reported non-recovery at 6-month follow-up [17]. It is, therefore, of interest to investigate whether self-reported health status changes at 2–4 years after the accident.

The primary aim of this study was to investigate long-term self-perceived non-recovery in patients with a WAD who had reported their injury to insurance companies and, secondly, to study the effect that compensation may have on the non-recovery rate.

Materials and methods

This prospective cohort study on self-reported non-recovery among patients who had filed an insurance claim regarding a WAD after an MVA shares the population with a previously published study [17]. The participants were recruited from two of the largest insurance companies in Sweden, Folksam and Trygg-Hansa, during a 22-month period from February 1, 2010, through November 30, 2011. A case worker at the insurance company asked the patient for permission to be contacted by the research team. The research team was informed when a patient had agreed to participate. The patient was then contacted by telephone by a study nurse, who gave information about the study, checked inclusion and exclusion criteria and obtained informed consent. The patients were asked to fill out a web-based questionnaire and were informed that they would be followed up after 6 months and after 2–4 years (Fig. 1.)

Study population

Adults ≥ 18 years of age reporting a WAD to their insurance company and suffering from neck discomfort at the

Fig. 1 Flowchart of the inclusion process and follow-up

time when they were interviewed by the study nurse were included. Exclusion criteria were: pre-existing neck pain, non-Swedish-speakers, fractures or other injuries caused by the index MVA or hospitalization for more than 2 days due to the index MVA (according to self-reports), report of the index accident to the insurance company later than 3 weeks, residence outside of Sweden, and no persisting neck pain when interviewed by the research nurse.

Data were gathered at baseline, after 6 months, and after 2–4 years. The questionnaire was web based and, if the participant had not responded, a reminder was sent after 2 weeks. Those not responding to the reminder were called up by the study nurse and were offered help to respond if needed.

Data acquisition at baseline

Data regarding age, gender (male/female), highest level of education (university/<university), employment (employed/student/looking for employment/senior citizen/other), living conditions (single/single with children/cohabitant/cohabitant with children), sick leave (Yes/No), and a prior MVA to the index MVA (Yes/No). The levels of pain and mental distress were indicated on a numeric rating scale (NRS) from 0 to 10 (0 = no pain/mental distress, 10 = worst possible pain/mental distress).

Follow-up

At the 6-month and the 2–4-year follow-ups, the patients were asked whether they felt that they had recovered (Yes/No) and were asked to rate their level of neck pain on a scale from 0 to 10 (0 = no pain, 10 = worst possible pain).

At the 2–4-year follow-up, an additional question about the insurance company's processing of their case was included (case closed, Yes/No) and if the patient had received financial compensation for his/her injury (Yes/No)?

Statistical analysis

IBM SPSS Statistics, version 22 (SPSS Inc., Chicago, Illinois, USA) was used to perform all statistical analyses. For the analyses, age was categorized as ≤ 25 , 26–40 and ≥ 41 years and employment status as employed (i.e., employed and students) or unemployed (i.e., those looking for employment, senior citizens, and others). Levels of pain were categorized as NRS < 4 , 4, < 6 , and ≥ 6 . The level of mental distress was categorized as NRS < 1 , 1–5, and > 5 . To test associations between two nominal or ordinal variables, Chi square cross-tabulation was used. When the Chi square test's underlying assumptions were not fulfilled, Fisher's exact test was used for corresponding purposes. A *p* value of < 0.05 was considered statistically significant.

For the adjusted binary linear regression analysis, we included pain, mental distress, age, gender, highest level of education, and insurance company. In the crude analysis, the association between non-recovery and the variables was included one at the time. The mean values of pain were analysed with independent *t* test.

Results

In total, 144 patients were included. After 6 months, 116 (80.6%) had completed the follow-up questionnaire. All the included participants received the final questionnaire after 2–4 years regardless of whether they had answered at the 6-month follow-up and 118 (81.9%) of the 144 included participants answered the final follow-up questionnaire, 99 (68.7%) answered both follow-up questionnaires, and 9 (6.2%) were lost to follow-up on both occasions.

Females were somewhat overrepresented, 87.5% of the participants were 26 years old or older and most of the participants were employed, had a lower than university educational level, and cohabited with or without children (Table 1).

Among the participants, 11.1% had been on sick leave after the MVA. A medium or high level of pain (i.e.,

Table 1 Characteristics of the study population at baseline (*n* = 144)

	<i>n</i>	Column %
Gender		
Male	62	43.1
Female	82	56.9
Age (years)		
≤ 25	15	10.4
26–40	63	43.8
≥ 41	66	45.8
Highest level of education		
< University	93	64.6
University	51	35.4
Employment		
Employed	125	86.8
Unemployed	19	13.2
Initial sick leave		
No	111	87.4
Yes	16	12.6
Initial level of pain (NRS)		
< 24	12	8.3
24–65	100	69.4
> 65	32	22.2
Level of mental distress (NRS)		
< 5	50	34.7
5–51	56	38.9
> 51	38	26.4
Insurance company		
A	77	53.5
B	67	46.5
Financial compensation ^a		
No	81	68.6
Yes	37	31.4

^aAt the time of 2–4 years follow-up (*n* = 118)

NRS ≥ 4) was experienced by 91.6% and a medium or high level of mental distress (i.e. ≥ 3) was experienced by 45.1% (Table 1).

After 6 months, 69.8% (81/116) and, after 2–4 years, 55.9% (66/118) of the participants reported non-recovery from the index MVA, i.e., the self-perceived rate of non-recovery decreased by 13.9 percentage points, from the follow-up at 6 months to the final follow-up after 2–4 years.

There were no significant differences between those who reported recovery and those who reported non-recovery after 2–4 years regarding background factors (gender, age, insurance company, educational level, and employment) or regarding reported sick leave or a high level of mental distress. A high level of neck pain directly after the accident was strongly associated with non-recovery after 2–4 years (Table 2).

Table 2 Self-perceived recovery and non-recovery after 2–4 years in relation to baseline data

Variable	Self-perceived non-recovery after 2–4 years						
	Total	<i>n</i>	%	Crude OR	95% CI	Adjusted OR	95% CI
Gender							
Male	49	27	55.1	Ref			
Woman	69	39	56.5	1.3	0.51–2.21	0.63	0.23–1.77
Age							
< 25	11	8	72.7	Ref			
26–40	51	26	51.0	0.39	0.93–1.64	0.44	0.07–2.83
> 40	56	32	57.1	0.50	0.12–2.09	0.87	0.14–5.46
Highest level of education							
< University	73	44	60.3	Ref			
University	45	22	48.9	0.63	0.30–1.33	1.17	0.42–3.24
Employment							
Employed/studying	102	56	54.9	Ref			
Unemployed	16	10	62.5	1.4	0.46–4.05	1.52	0.36–6.42
Sick leave because of MVA							
No	93	50	53.8	Ref			
Yes	14	7	50.0	0.86	0.28–2.65	0.23	0.46–1.34
Initial level of pain (NRS)							
< 24	11	1	9.1	Ref			
24–65	79	42	53.2	11.35	1.39–92.94	^b	^b
> 65	28	23	82.1	46.00	4.74–446.04	^b	^b
Initial level of mental distress (NRS)							
< 5	42	18	42.9	Ref			
5–51	44	28	63.6	2.33	0.98–5.55	1.89	0.61–5.82
> 51	32	20	62.0	2.22	0.87–5.69	1.63	0.45–6.85
Insurance company							
A	65	31	47.7	Ref			
B	53	35	66.0	2.13	1.01–4.51	2.46	0.88–6.85
Financial compensation ^a							
No	49	39	48.1	Ref			
Yes	37	27	73.0	2.91	1.25–6.78	4.33	1.37–13.66

The relation between self-perceived recovery and baseline variables at the 2–4-year follow-up of patients filing an insurance claim regarding a whiplash-associated disorder (WAD) after a motor vehicle accident

^aAt the time of follow-up (*n* = 118)

^bToo few individuals with the outcome non-recovery

Effect of financial compensation

At the 2–4-year follow-up, 86 participants (73%) reported having their insurance claim closed: 37 (43%) of those reporting their case being closed had been financially compensated by their insurance company. Twenty seven of the compensated claimants (73%) reported non-recovery and 10 (27%) recovery ($p = 0.039$) and, among those who did not receive compensation, no difference in the reported recovery rate was noted (51 vs. 49%) (Table 3).

On adding the claimants reporting that their insurance claim had not been closed to the group that had not been compensated, the difference remained significant

($p = 0.016$) (Table 3). No difference in recovery was seen between those with open and closed cases ($p = 0.075$).

The compensated group had a higher risk of reporting non-recovery at the time of follow-up when consideration was given to possible confounders (Table 2).

There were no significant differences between those who had received compensation and those who had not regarding gender, age, level of education, employment, or sick leave at baseline (Table 4).

Nor did we find any association between the level of pain at baseline and financial compensation at the 2–4-years follow-up (Table 4). However, in participants with a medium level of mental distress (NRS 5–51) at baseline an

Table 3 Association between financial compensation Self-perceived non-recovery

	Self-perceived recovery after 2–4 years		
	Recovered <i>n</i> (%)	Non-recovery <i>n</i> (%)	<i>p</i> value*
Financial compensation if case closed (<i>n</i> = 86)			
Yes	10 (27%)	27 (73%)	0.039
No	24 (49%)	25 (51%)	
Financial compensation for all patients (open and closed cases) (<i>n</i> = 118)			
Yes	10 (27%)	27 (73%)	0.016
No	42 (52%)	39 (48%)	

Grouping of the participants when consideration has been taken to whether the case is open or closed

*Pearson Chi square

Table 4 Compensation by the insurance company after 2–4 years in relation to baseline variables, *n* = 144

Variable	Financial compensation				<i>p</i> value
	No		Yes		
	<i>n</i>	Column %	<i>n</i>	Column %	
Gender					
Male	49	45.8	13	35.1	0.33 [#]
Female	58	54.2	24	64.9	
Age (years)					
≤ 25	13	12.1	2	5.4	0.36 [#]
26–40	48	44.9	15	40.5	
≥ 41	46	43.0	20	54.1	
Highest level of education					
< University	74	69.2	19	51.4	0.07 [#]
University	33	30.8	18	48.6	
Employment					
Employed	92	86.0	33	89.2	0.62 [#]
Unemployed	15	14.0	4	10.8	
Initial sick leave					
No	82	90.1	29	80.6	0.15 [#]
Yes	9	9.9	7	19.4	
Initial level of pain (NRS)					
< 24	10	9.3	2	5.4	0.59*
24–65	75	70.1	25	67.6	
> 65	22	20.6	10	27.0	
Level of mental distress (NRS)					
< 5	41	38.3	9	24.3	0.01 [#]
5–51	34	31.8	22	59.5	
> 51	32	29.9	6	16.2	
Insurance company					
A	55	51.4	22	59.5	0.40 [#]
B	52	48.6	15	40.5	

n = 37 for the compensated group and *n* = 107 for the non-compensated group[#]Pearson Chi square

*2-sided Fisher's exact test

Fig. 2 Level of pain baseline and follow-ups for the compensated and non-compensated groups. *n* = responders in the compensated group. *N* = responders in the non-compensated group. Error bars: 95% CI

association was noted for receiving financial compensation (Table 4).

On looking at the level of pain at baseline, after 6 months, and after 2–4 years, there was no significant difference between the financially compensated group and the non-financially compensated group (Fig. 2).

Discussion

This prospective study highlights previous findings that non-recovery rates remain relatively high after whiplash trauma [18] in an insurance company setting even after 2–4 years. To the best of our knowledge, this is the first prospective study with a long-term follow-up of participants recruited from insurance companies. The long-term non-recovery of patients identified with a WAD trauma at emergency

departments has been reported to be around 30% [19, 20]. It can be questioned if individuals with less severe symptoms of WAD are less likely to file an insurance claim, which might be the reason for the over 50% non-recovery in our study. In that scenario, the true prognosis of the injury could be better in a clinical setting. Previous studies suggest, however, that the definition of “recovery” has a greater influence on the outcome than the population setting [5] and the variety of definitions is vast [21].

The finding that only 73% of the claims were closed after 2–4 years and that only 43% of the claimants had been financially compensated was somewhat surprising. The guidelines from the Swedish National Board of Traffic Injuries (Trafikskadenämnden) state that all victims of a traffic injury are entitled to compensation for economic losses and pain and suffering [2]. The “no-fault” compensation model used in Sweden should, in theory, eliminate prolonged insurance claims and guarantee that all victims of an MVA are financially compensated to some extent. However, the risk of recall bias among our participants must be taken into consideration. Insurance claims regarding damage to the motor vehicle, police investigations, and emotional traumatization are possible factors causing mix-ups. The self-reporting of not having been compensated is, however, the variable of interest in this study and is represented by the presumption that no such compensation has been given. Another explanation for the low frequency of financially compensated claimants might be their lack of knowledge of their legal rights to compensation.

The finding that those who received economic compensation for their injury had a worse outcome than those who did not may have several explanations. Firstly, reverse causation, i.e., those with persisting symptoms and a prolonged recovery are more likely to be compensated. It is tempting to conclude that those with more pain get compensated more frequently. However, the absence of a statistical association between the level of pain at the 6-month and 2–4-year follow-ups and compensation status contradicts this assumption. Pain is a very strong predictor of prolonged recovery [11, 21] and one would assume that this fact would lead to a stronger insurance claim and a higher frequency of compensation. Secondly, that the insurance claim itself may lead to a worsened outcome. It has been shown that an ongoing compensation process affects the claimants’ quality of life negatively, both physically and mentally [13, 22] and that a prolonged time to claim closure is a negative prognostic parameter [13, 23]. Indirectly, this could be correlated with being an experience of non-recovery after the index trauma [24] and support the “compensation theory” [14]. In this study, no difference in outcome between the participants with open and closed cases could be detected. However, the outcome in participants with relatively high levels of mental distress correlated with a higher frequency of self-reported

compensation. This suggests that mental distress, rather than pain as such, was correlated with financial compensation. It is also possible that the non-compensated and compensated groups differed regarding parameters that were not included in our study and, therefore, not detected in the analysis. The linkage between non-recovery and financial compensation remains uncertain and the mechanisms of eventual negative association between these factors cannot be determined on the basis of this study. Apparently, there are still undescribed factors that influence the long-term outcome in WADs, whereas financial compensations may indeed be one.

One strength of this study is the use of validated and reliable outcome measures [8]. Moreover, it can be argued that when examining recovery after musculoskeletal injuries, the most accurate view of interest should be the patient’s own experience of recovery. Another strength is having participants from two large nationwide insurance companies since local administrative routines and legal interpretations could be possible confounders in a material from a one-company-setting only. The follow-up rate was also relatively high (81.9% at 2–4 years).

This study has also some limitations. The material is relatively small which, consequently, makes the confidence intervals wide and increases the risk of type II errors (i.e. differences in the population between the groups were not detected in the analysis). Another limitation is the absence of reports of time to claim closure since 2–4 years is a wide time span for follow-up and reflects the slow rate of inclusion. This may have influenced the outcome. Furthermore, the risk of recall bias cannot be ignored. The probability of a higher rate of case closure than 73% after 2–4 years must be considered great and may reflect the long-time span since the case was open. Also, recall of having received financial compensation several years ago must be considered imperfect. It can only be speculated as to whether those who were compensated but did not realize or recall it consider themselves compensated or not.

The lack of randomization between the compensated and non-compensated groups leads systematically to a selection bias and makes the causal relationship even more difficult to predict. Finally, the participants followed up at 2–4 years were not identical to the ones followed up at 6 months. Willingness to participate in one follow-up, but not the other, may reflect their satisfaction with the outcome.

Conclusion

The non-recovery rate reported by the patient after 2–4 years was 55.9% in our study and was based on WAD cases reported to an insurance company. These data emphasize the poor recovery rate after whiplash trauma and indicate an even higher non-recovery rate than in a medical setting. The

patients receiving financial compensation had a higher non-recovery rate than the ones not receiving compensation. Our analysis showed that the latter group did not report a higher level of self-reported pain, which may indicate that financial compensation is a stand-alone risk factor for non-recovery and strengthens the compensation hypothesis.

There was an overrepresentation of patients with an elevated level of mental distress at the time of the accident that may have influenced their compensation-seeking behavior.

Compliance with ethical standards

Conflict of interest None of the authors has any potential conflict of interest.

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