**Institutionen för Neurobiologi, Vårdvetenskap och Samhälle;
Centrum för Allmänmedicin, Karolinska Institutet**

ON THE REHABILITATION OF NON-ACUTE, NON-SPECIFIC SPINAL PAIN

AKADEMISK AVHANDLING
som för avläggande av medicine doktorsexamen vid Karolinska Institutet offentligen försvaras i Hörsal 4-263, entréplanet, Alfred Nobels allé 12, Huddinge.

Fredagen den 17 december 2010, kl 09.00

av
Odd Lindell
Leg läkare, specialist i allmän medicin

Handledare:
Professor Lars-Erik Strender
Karolinska Institutet
Centrum för Allmänmedicin

Fakultetsopponent:
Professor Steven Linton
Juridik, psykologi och socialt arbete
Örebro Universitet

Betygsnämnd:
Docent Ingvar Krakau
Institutionen för medicin, Solna (MedS)
Karolinska Institutet

Professor Eva Vingård
Institutionen för medicinska vetenskaper
Arbets- och miljömedicin
Uppsala Universitet

Docent Rolf Wahlström
Institutionen för Folkhälsovetenskap (PHS)
Avdelningen för global hälsa (IHCAR)
Karolinska Institutet

Stockholm 2010

ABSTRACT

Background

Non-specific spinal pain (NSP), comprising back and/or neck pain, is one of the leading disorders behind long-term sick-listing. The general aim was to study the rehabilitation of non-acute (=leading to full-time sick-listing > 3 weeks) NSP as regards **epidemiology** ((Study) I), **reliability** (II), **treatment** (III), and **return-to-work prediction** (IV).

Specific aims: I: To compare living conditions associated with long-term sick-listing for NSP in patients with non-acute NSP with a population-based sample of non-patients. **II:** To answer the question "given a 10-test package of function tests for patients with non-acute NSP, could an examiner without formal medical education be used without loss of quality?" **III:** For patients with non-acute NSP, a programme of cognitive-behavioural rehabilitation was compared with traditional primary care. The specific aim was to answer the question "within an 18-month follow-up, will the outcomes differ in respect of sick-listing and number of health-care visits?" **IV:** For patients with non-acute NSP, to answer the question "which are the predictors at baseline for stable (= lasting ≥ 1 month) return-to-work during a 2-year period after baseline: objective variables from function tests, socioeconomic, subjective and/or treatment variables?"

Methods

I (cross-sectional study)**:** For the 125 patients of study III, living conditions were compared with 338 non-patients by logistic regression. **II** (methodological study)**:** Examination by a physiotherapist (A) in performing the 10-test package was compared with that by a research assistant (B) without formal medical education. The reliability, including inter- and intra-rater reliability, was assessed. In the inter-rater reliability study, 50 participants (30 patients + 20 healthy subjects) were tested once each by A and B. In the intra-rater reliability study, the 20 healthy subjects were tested twice by A or B. One-way ANOVA intra-class-correlation coefficient (ICC) was calculated. **III** (randomized controlled trial)**:** After stratification by age (≤ 44 / ≥ 45 years) and subacute / chronic (= full-time sicklisted 3-12 / > 12 weeks) NSP, 125 primary-care patients were randomized to cognitive-behavioural rehabilitation (rehabilitaion (rehab) group) or continued primary care (primary-care group). Outcomes: *Return-to-work share* (percentage) and *Return-to-work chance* (hazard ratios) over 18 months; *Net days* (crude sick-listing days x degree), and the number of *Visits* (to physicians, physiotherapists etc) over 18 months and the 3 component 6-month periods. Descriptive statistics, Cox regression and mixed-linear models were used. **IV** (prospective cohort study)**:** *Stable return-to-work* was the outcome variable, the above-mentioned factors were the predictive variables in multiple-logistic regression models, one per follow-up at 6, 12, 18 and 24 months. The predictors which were represented in ≥ 3 follow-ups were finally considered.

Results

I: In the univariate analyses, 13 of the 18 living conditions had higher odds for the patients with a dominance of physical work strains and *Indication of alcohol over-consumption*, (odds ratio (OR)) 14.8 (95%CI)[3.2–67.6]. Five conditions remained in the multivariate model: *High physical workload*, 13.7 [5.9–32.2]; *Hectic work tempo*, 8.4 [2.5–28.3]; *Blue-collar job*, 4.5 [1.8–11.4]; *Obesity*, 3.5 [1.2–10.2]; and *Low education*, 2.7 [1.1–6.8]. **II:** All 5 tests requiring no manual fixation had acceptable reliability (ICC > 0.60 and no indication of systematic error). The 5 tests that required manual fixation had poor reliability except cervical rotation. The difference (5 vs 1) was significant ($p = 0.01$). **III: All patients:** *Return-to-work share* and *Return-to-work chance* were equivalent between the groups. *Net days* and *Visits* were equivalent over 18 months but decreased significantly more rapidly for the rehab group over the 6-month periods ($p < 0.05$). **Subacute patients:** *Return-to-work share* was equivalent. *Return-to-work chance* was significantly greater for the rehab group (hazard ratio 3.5 [1.001–12.2]). *Net days* were equivalent over 18 months but decreased significantly more rapidly for the rehab group over the 6-month periods and there were 31 days fewer in the 3rd period. *Visits* showed similar though non-significant differences and there were half as many in the 3rd period. **Chronic patients:** *Return-to-work share, Return-to-work chance* and *Net days* were equivalent. *Visits* were equivalent over 18 months but tended to decrease more rapidly for the rehab group and there were half as many in the 3rd period (NS). **IV:** Three variables qualified: *Low total prior sick-listing* (including all diagnoses) was the strongest predictor in 2 follow-ups, 18 and 24 months, (OR) 4.8 [1.9–12.3] and 3.8 [1.6–8.7] respectively, *High self prediction* (the patients' own belief in return-to-work) was the strongest at 12 months, 5.2 [1.5–17.5] and *Young age* (≤44) the 2nd strongest at 18 months, 3.5 [1.3–9.1].

Conclusions

Epidemiology: In the univariate analyses, the patients vs the non-patients had higher odds for most of the conditions. In the multivariate analysis, 5 conditions qualified, indicating work strains, lower social class and life-style. As these cross-sectional data makes causal conclusions impossible, they should be complemented by prospective research. **Reliability:** Given a 10-test package for patients with non-acute NSP, an examiner without formal medical education could be used without loss of quality, at least for the 5 tests that require no manual fixation. To make our results more generalizable, a similar study should be conducted with 2 or more examiners with and without formal medical education, and the intra-rater reliability study should also include patients and involve more participants. **Treatment:** Though the results were equivalent over 18 months, there were indications that cognitive-behavioural rehabilitation in the longer run might be superior to primary care. For subacute NSP, in terms of both sick-listing and health-care visits; for chronic NSP, in terms of health-care visits only. More conclusive results concerning this possible long-term effect might require a longer follow-up. **Return-to-work prediction:** The strong predictors of stable return-to-work were 2 socioeconomic variables (*Low total prior sick-listing* and *Young age*), and 1 subjective variable (*High self prediction*). Objective variables from function tests and treatment variables were non-predictors.

Keywords: Non-specific; non-acute; subacute; chronic; spinal pain; back pain; neck pain; sick-listing; cross-sectional; methodological; randomized controlled; prospective cohort; epidemiology; reliability; treatment; return-to-work; prediction.