Reviewer's report

Title: Course and prognosis of non-traumatic arm, neck and shoulder complaints: design of a prognostic cohort study

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Reviewer: Harald S Miedema

Reviewer's report:

I. The authors propose a interesting new cohort study with regard to complaints of the arm, neck and shoulder (CANS). However, the setting of their cohort is somewhat different from usual primary or secondary care. They established a network of health care professionals working in an occupational context for the employees and students of two universities on the one hand, and a network of 39 health care professionals working in primary or secondary care that responded positively on a request for participation in the study on the other hand. Aim of the study is to provide insight into the course of CANS, to identify determinants of this course in the longer term, and to examine the relationship between medical treatments and patient outcomes.

II. Knowledge about prognostic factors that can predict the course and outcomes of arm, neck and shoulder complaints is scarce, so new studies on this subject are welcomed. However, the authors address a large group of complaints and symptoms, but fail to present a framework for the diagnoses they expect to encounter in this study, nor a clear hypothesis in which the expectations are given about the relationships between the most important determinants (e.g. medical interventions, duration of complaints before consultation, workrelated factors, activity related factors, psychosocial factors etc.) and the outcomes they described. Furthermore detailed information is lacking about the cohort they want to study, the type and number of interventions they expect to be of influence on the outcomes in both settings of the study, the number of patients they expect to include based upon epidemiological data of the underlying populations and the power that is needed for the analysis of the most important relationships.

III. The answers to the specific questions of the editor for this review are as follows:

1. Will the study design adequately test the hypothesis?

No clear hypothesis is given, and to much information is lacking for a positive answer to this question; the study is presented as a observational prospective cohort study, but in fact two types of interventions have been conducted (CANS knowledge and treatment center with supposedly specific approach and CANS care network with specific management guidelines, both cohorts do not reflect usual care. Also it is unclear if the normal variation in medical treatments will be reduced by the specific approach or management guidelines, so if there will be enough contrast between patient groups to study the relationships between
medical treatments and outcome. In my opinion the research question for this cohort study should be specified and a hypothesis postulated that are to be tested.

2. Are sufficient details provided to allow replication of the work or comparison with related analyses: if not, what is missing?

Detailed information is lacking about:
- the population under study; a) on the one hand regular (usual) care, but no discrimination is made between primary and secondary care (especially in secondary care selection can occur because of special interest of a medical specialist, e.g. the rehabilitation physician in Maastricht), and within primary care between general practitioners and physical therapists etc. and the numbers of patients that are expected at each group of providers; b) on the other hand the CANS knowledge and treatment center, not clear is how the selection is made of patients that can or may consult the professionals of this center (referral by occupational physicians?), no expected numbers are presented, no comparison of this subpopulation with the other subpopulation is given.
- the type of disorders that can be included and the way in which these disorders can be diagnosed by the professionals with various background (medical doctors, medical specialists, physical therapists etc.); discrimination between specific and aspecific disorders
- the type and number of medical treatments that are of interest considering the goal of the study; with regard to physical therapeutic interventions it is not mentioned whether the various possible treatments will be differentiated;
- in the description of the CANS care network it is said that the professional received instructions about the management of CANS according to guidelines, but no explanation is given with regard to the content of this management and how this would influence the care they would have provided otherwise;
- the power of the study that is needed to establish the relationships between the main determinants of interest and the primary outcome.

3. Is the planned statistical analysis appropriate?

Because four follow-up measurements are planned within one year analyses that consider repeated measurements are necessary. This is mentioned, but also simple logistic regression, but the end-point for this analysis is not given.

It is mentioned that a discrimination will be made between working and non-working subpopulations. However, expected numbers (related to the power that is needed) are lacking, as well as a definition of the working subpopulation and the way in which this is established.

Because no hypothesis nor power analysis is given it is hard to guess if at the end more prognostic factors can be determined than in the studies of for instance Feleus et al. and Karels et al.; especially the subquestion about the relationship between medical treatments and outcome is interesting, but it is hard to predict whether this question can be answered. Furthermore, because the disorders that are included are heterogeneous and seem to include both specific and aspecific
disorders at various locations, the study of the relationships between medical treatments and outcome can be hampered by this heterogeneity.

4. Is the writing acceptable?
The writing is acceptable, however the English writing can be improved. There are three sections that seem to be of less interest to the general reader:

- CANS knowledge and treatment center: relatively extensive description, but still it is not clear which patients will consult the professionals at this center and how they differ from other populations; also the specific approach of these professionals is not given, however it seems that most professionals in this setting are physical therapists that are trained in workrelated CANS.

- CANS care network: this seems to be a rather heterogeneous group of professionals, but it is not clear how they act as a network other than that they spent a two day course together. It is said that the group is “complemented” by five safety, health and welfare workers and three occupational physicians: are these complementary professionals involved in the patients that consult the professionals in the network or what is their specific role?

- Description of the computer-based record system is rather extensive.

IV. Minor remarks:

1. In the description of background it is not clear what this study will add to the studies of Feleus et al. and Karels and al., both studies also addressing populations with arm, neck and shoulder complaints at various sites, including pain at multiple sites. The study of Karels and not Feleus was conducted in physiotherapy practice.

2. The second paragraph of page 4 is unclear to me: a multidisciplinary approach is mixed up with heterogeneity of patients, involvement of different caregivers providing various treatments, possible multifactorial relationships etc.

3. In the third paragraph a monodisciplinary setting is mentioned, but it is unclear what is ment by this. The studies of Feleus et al. and Karels et al. both included occupational factors.

   Descriptions and definitions should be clear, for instance multi-site pain (supposedly in one patient) differs from pain at various sites (in different patients). On page 5 multiple interventions are mentioned, is this in one patient or in different patients.

4. In the last paragraph of page 5 an episode is defined as new if patients have not visited a care professional for the same complaint in the preceding 3 months. This seems insufficient, as many patients have long lasting complaints without consulting a care professional. Furthermore it is not clear if and how recurrence of complaints are registered. To my opinion a specific question about the duration of complaints should be included in the questionnaire and patients should be excluded with complaints of long duration (for instance >3 months).

5. The discussion contains a summary of the study, but does not discuss many
limitations and its strengths and weaknesses, nor what this study will add to the current knowledge. In the last section it is unclear what is meant by “In addition, based upon the results, the development and evaluation of intervention strategies can take place in general practice ….”

**Level of interest:** An article whose findings are important to those with closely related research interests

**Quality of written English:** Needs some language corrections before being published

**Statistical review:** Yes, but I do not feel adequately qualified to assess the statistics.

**Declaration of competing interests:**

I declare that I have no competing interests