Reviewer's report

Title: Clinical Attributes for the Conservative Gait Pattern in Diabetes

Version: 1 Date: 21 July 2008

Reviewer: Smita Rao

Reviewer's report:

Recommendation:
- Unable to decide on acceptance or rejection until the authors have responded to the major compulsory revisions

Level of interest
- An article of importance in its field

Quality of written English
- Acceptable

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

Reviewers Report:

General Comments:

The manuscript is well-organized and addresses a clinically relevant purpose. However there are serious concerns related to the choice of analysis and interpretation of results.

Specific Comments have been divided into Major and Minor Revisions:

Major Revisions:

Methods and Statistical Analysis:
1. The authors use visual gait analysis to define apropulsive gait. Power generation at push-off is a continuous variable and the validity of this definition of apropulsive gait in patients with DMPN has not been addressed. An examination of the validity and reliability of the assessment of apropulsive gait in DMPN, as relevant to this study is lacking. In addition, the lack of blinding may contribute to investigator bias.

2. The absence of a hypothesis is concerning. This data is unique and valuable but may be better suited to analyses such as likelihood ratios and confidence intervals than regression analysis.

Conclusions:
1. Conclusions are overstated and do not support the results. Ankle mobility differed by 2 degrees between the groups and explained 3.4% of the variance in conservative gait strategy. These data do not support the Conclusion stated on Page 8 of 12.

2. The data suggest that plantar loading in the apropulsive and normal groups is similar. This is an interesting finding since previous studies report that ankle power at push off is directly related to forefoot loading. The authors do not address the possibility that the apropulsive strategy may have been utilized as a means to modulate loading. Suggestions to focus on interventions that improve ankle mobility may be accompanied by the possibly deleterious side effect of concomitant increases in plantar loading. The authors do not address these clinically relevant issues in the results or discussion section.

Minor Essential Revisions:

Background:
1. The first paragraph introduces the presence of gait instability in patients with diabetes and neuropathy. It is not clear whether the authors expect patients with DMPN to demonstrate increased unsteadiness during gait or adopt a conservative pattern as a compensation for underlying unsteadiness. I would recommend reorganizing the first paragraph to clarify potential causes and consequences of gait instability in patients with DMPN.

2. The second paragraph alludes to fall risk. The relationship between gait instability and fall risk is missing and needs to be elucidated. However, fall risk does not feature later in the manuscript, in terms of methods or results.

Methods:
1. Please provide a rationale for assessing total foot loading instead of regional loading. Foot architecture, presence of callus and restrictions in range of motion have all been postulated to have specific consequences on different regions of the foot. If plantar loading of the foot as a whole was quantified, some of these relationships may wash out.

Statistical Analysis:
1. Please indicate which of the dependent variables described in the Methods section are used as predictors. For instance, were the following variables used in the analysis and how:
   a. Diabetes duration
   b. HbA1c
   c. Presence of arterial insufficiency
   d. 1st MTP ROM
   e. Deformity
   f. Positive Romberg sign
g. Presence of callus

2. Were the a priori co-variates independent of each other?

3. A discussion of statistical power is lacking. This is important particularly because the groups were defined post-hoc.

Discussion:

1. No direct relationship between an apropulsive gait pattern and fall risk has been identified in the literature or through this study. Please eliminate references to balance and fall risk in the manuscript since this study did not assess balance or fall risk.

2. The second sentence on page 8 of 12 “These findings are also supported by Mueller and colleagues” is misleading. Mueller et al described the apropulsive gait pattern. However their work has shown that an apropulsive gait pattern is accompanied by a reduction in forefoot loading, contrary to the findings of the current study.

Level of interest: An article of importance in its field

Quality of written English: Acceptable

Statistical review: Yes, and I have assessed the statistics in my report.