Reviewer’s report

Title: Risk of fracture among patients with polymyalgia rheumatica and giant cell arteritis: a population-based study

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Reviewer: Davide Gatti

Reviewer's report:

The manuscript entitled "Risk of fracture among patients with polymyalgia rheumatic and giant cell arteritis: a population -based study" appears very interesting and gives some relevant information concerning a topic which plays a key role in the management of these two diseases. The paper is well written and with a good and clear scientific terminology. The Authors should emphasize the data regarding the incidence of GCA in patients with PMR (6.1%) and of symptoms of PMR in GCA (27.5%) in clinical practice.

There are some points that should be resolved by the Authors.

Major points:

1) Discussion chapter (16-18 line, page 13): It's hard to explain why the risk of fracture "...was lower in people who received higher cumulative doses of glucocorticoids". The risk appeared higher within the first year of diagnosis (for both diseases) when the doses of corticosteroids are commonly higher. I suggest the Authors to calculate the cumulative doses of the first year to study a possible positive correlation with the fracture risk in this very year.

2) Discussion chapter (line 3, page 13): this is not the first study to quantify the risk of fracture in people with GCA. Please see and quote: Wilson et al. Semin Arthritis Rheum. 2017 - Incidence of outcomes potentially associated with corticosteroid therapy in patients with giant cell arteritis.; Rossini et al Reumatismo. 2017 - Prevalence and incidence of osteoporotic fractures in patients on long-term glucocorticoid treatment for rheumatic diseases: the Glucocorticoid Induced OsTeoporosis TOol (GIOTTO) study.

Minor points:

1) Background chapter (line 21-22): The sentence regarding that "...in other inflammatory conditions, the increased fracture risk is independent of glucocorticoid use" should be rephrased with a lesser degree of strength. It is clear that in these cases the disease per se...
induces an increase in fracture risk, but this does not erase the addictive importance of the corticosteroid use.

2) Limitation of study Chapter (page 14): the use of a Clinical Practice Research datalink is useful to identify the patients who incurred in a clinical fracture. Obviously, this method does not allow to find the asymptomatic or morphometric vertebral fractures. Thus, the study underweights the risk of vertebral fractures and of fracture risk and this should be mentioned in this chapter. It is possible that in this kind of patients the pain due to the disease could mask the pain due to a new vertebral fracture.

3) Comparison with other study Chapter (line 52, page 14): please quote the more recent papers demonstrating a dose-dependent increase in fracture risk with glucocorticoid use (see point 2 of Major points)

4) The surprising data regarding the cumulative corticosteroid doses in PMR and GCA could be due to the fact that in this study, in a relevant amount of cases, the diagnosis could have been done by a General Practitioner and not by the Rheumatologist. For the same reason, also the treatment could have been different in regards with the doses and the duration of the glucocorticoid therapy. It's more likely that a General Practitioner might use inappropriate doses for longer time.

5) I can't find any data regarding the risk of fracture in the patients with PMR and GCA treated with bisphosphonates. May the Authors please show these data?

**Are the methods appropriate and well described?**
If not, please specify what is required in your comments to the authors.

Yes

**Does the work include the necessary controls?**
If not, please specify which controls are required in your comments to the authors.

Yes

**Are the conclusions drawn adequately supported by the data shown?**
If not, please explain in your comments to the authors.

Yes

**Are you able to assess any statistics in the manuscript or would you recommend an additional statistical review?**
If an additional statistical review is recommended, please specify what aspects require further assessment in your comments to the editors.

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