Reviewer’s report

Title: Trends in knee arthroscopy and subsequent arthroplasty in an Australian population: a retrospective cohort study

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Reviewer: Megan Bohensky

Reviewer’s report:

Thank you for the opportunity to review this manuscript. This study evaluated a large amount of data, which clearly required considerable effort. Furthermore, I found the manuscript to be very well written.

Given recent debate in Australia and internationally about the value of arthroscopies, particularly for people with osteoarthritis, I think this paper poses important and well-defined questions. I believe the abstract and title accurately convey the findings of the paper.

Major Compulsory Revisions

The main methodological concern I have is that, in the absence of data on laterality, the authors have assumed that the TKA and arthroscopy occurred ipsilaterally. The authors have tried to address this issue by undertaking an audit of 42 patient medical records from two institutions. I think the authors need to explain further how this sample of records were selected and demonstrate if they are representative of the overall cohort of patients. Specifically, did the 42 records cover all 8 years represented in the data? Within this audited sample, 5% of records had contralateral procedures (i.e. the arthroscopy and TKA occurred on opposite sides). Can the authors please comment on how a potential 5% error rate is likely to impact their findings? Is there reason to think the proportion of contralateral procedures could be higher in certain sub-groups of patients, particularly older patients who are more likely to undergo TKA?

1. Discussion- paragraph 4-5

The authors note that the rate of TKA within 2 years of an arthroscopy was higher for patients aged 65 and older than what has been identified previously. Could the authors please comment as to whether this finding may is the result of a higher chance of having contralateral procedures in older people?

2. Methods- Paragraph 4

The authors used a negative binomial regression analysis to study changes in rates of procedures and conversion to arthroplasty over years. Could the authors please clarify if negative binomial regression was used to due to the dispersion of the data? Was an offset variable used in the model? If so, why was this offset chosen?
Minor Essential Revisions

1. Methods- Paragraph 1
While the use of administrative data has been questioned in the past, I think these methods are becoming more acceptable internationally. I happen to know that CHeReL undertakes routine quality checks of the APDC data and their data linkage processes. I think mention of this in the methods could help to allay any concerns readers may have about the use of administrative data.

2. Also, could the authors please clarify whether the APDC collects data from all public and private hospitals in NSW? (i.e. is it likely to have 100% coverage of arthroscopies and arthroplasties performed in the state?)

3. Methods- Paragraph 3
The authors also note that data on indication for surgery were poorly reported. This leads to questions about the quality of reporting for other variables used in the study. Can the authors please quantify the rates of missing data? Were any methods used to address high rates of missing-ness?

4. Results-Paragraph 1
According to the relevant standards for this paper (the STROBE guidelines for cohort studies), results should provide characteristics of study participants. I think the results section might benefit from a Table briefly describing the overall characteristics (e.g. age/gender distribution, number of institutions (if available), treatment in public and private settings, etc)

5. Discussion
In the second paragraph of the Discussion and in the Conclusion, the authors refer to a 9-year study period. It seemed to be that the study was undertaken from July 2000 to December 2008, which is only 7.5 years. Can the authors please correct this?

6. Discussion- paragraph 3
The authors state in this paragraph that “increasing rates of arthroscopies have been reported elsewhere, attributed to the increasing rates of OA.” And in the next sentence state that “data from Canada and England have shown that the utilisation of knee arthroscopy for the treatment of osteoarthritis decreased between 1993 and 2004.” Both sentences reference the same study by Hawker et al. Could you please clarify if the rates of arthroscopy increased or decreased in this study?

7. There have been several other studies on rates of arthroscopies both in the United States and Australia that deserve mention in the discussion when contrasting these findings with others. While the authors do mention the study by Hawker, there have been at least three other recent studies (please see Kim et al Journal of Bone & Joint (American),Potts et al American Journal of Sports Med and Bohensky et al MJA).
8. Discussion- paragraph 6

Limitations
As the APDC only captures data on patients treated in New South Wales, is it possible that interstate migration, especially among younger patients, could have impacted the findings in relation to conversion to TKA?

9. Figure 2- Procedures per 100,000 population by age group
I found this graph a little confusing due to the 7 groups/lines. Is it possible to simplify it by aggregating some of the age groups together- for example 24-44 and 45-64?

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.

Declaration of competing interests:
I declare that I have no competing interests.