Reviewer's report

Title: Evaluating the impact of a novel restricted reimbursement policy for quinolone antibiotics: A time series analysis

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Reviewer: Ria Benko

Reviewer's report:

It is a well-written and interesting paper about a new antibiotic policy implemented in a Canadian ambulatory care setting with the aim of keeping quinolone use in bay. As the readership will not only come from Canadian healthcare people but from all around the world, sometimes more precise descriptions are needed.

Major Compulsory Revisions

1) More than 4/5 of visits belonged to OSA+ doctors. Than how can you give a reliable estimate about differences of prescribing behaviours of different kind of doctors? And why do you differentiate these two groups anyway?: both of them had new restrictive policy with small differences.

2) Segmented regression models use two parameters to describe changes: the level change (value at the beginning of the time intervals, describe sudden change) and slope changes (measure change during a time step: e.g. one month, describe gradual change). You have to explain this to readers in the methods section and than use these two parameters consequently in the results section to describe your findings. (Than it will be more clear that: e.g. there was only a sudden decrease in quinolone use for UTIs and URTIs after the implementation of the programme). To write on the figures the slopes and intercepts of the pre and post intervention regression lines would be also useful.

See also:


Minor Essential Revisions

1) For UTI the change in FQ use was – 3%, while for URTI it was – 1.6 %, I think it is clinically insignificant. Secondly, this was a level change (change between the first month’s use of before and after policy). But was this change stable over time?. (see also my comments above)

2) I think you should more carefully phrase about the implemented changes (new policy). OSA was only one main pillar of it, so I would retain to use of this acronym alone as the synonym of the implemented changes. Basically it was formulary change with the following main elements:
• new restriction policy for quinolones (OSA OR traditional prior authorisation)
• adding to formulary two new quinolones (these could not be prescribed with reimbursement at all?)

3) Nothing is known about the new therapeutic guideline (aimed at restricting the use of FQ)- what has been changed compared to the previous version of the guideline?

4) Could you give an example how this 'restricted' reimbursement policy worked? How was the system before? All antibiotics in formulary were reimbursed? At same scale? And in the new system?

5) As both kind of doctors (OSA+ and OSA-) could prescribe FQs with reimbursement than I cannot see any main difference between these two status. Maybe for OSA+ doctors this reimbursement was automatic, while for OSA- ones it took some time to receive the approval? Did the scale of their reimbursement differed? (I mean could they prescribe medicines with the same price for patients?)

6) Was the traditional prior authorisation of OSA negative doctors only an administrative step? Or has it been rejected any time? What motivated the doctors to become a designated FQ prescribers (OSA+) ? To save time?

7) Chart review: over estimate quality as informed consent was required. How many invited doctors denied to participate?

8) You found that guideline adherence was 42.5% and 58.5% before and after the policy change. What were the most common adherence problems? Does it changed over time? In which infection type out of the 4 the doctors ignored the recommendations?

9) Why adjustment for age was needed? The population was a narrow, homogenous age group (those above 65 yrs).

10) What was the fourth quinolone (not reimbursed one)

11) In the abstract you wrote: "impact on economical consequence": this topic was not touched in the manuscript. Deleit it please.

12) Figure 1 and 2: In all years in October the index visits which were followed by NO antibiotic use were outstanding (and this were the months with lowest FQ use). What is the explanation for that?

13) Levofloxacain use Figure: levo use dropped substantially before the introduction of the new reimbursement policy. Why?

Possible calculation problems/typing errors:

1) mortality risk: in the text: 0,3% in the Table 1: 0,8 %

2) in the text: 3856 patient visits vs. in Table 1: 3846 patient visits

3) any AB use within 30 days post index visit: in the text: 49,5%, in the table 50,8 %
4) In table 1. Quinolone use was 29.4% while in the Figure 1: the monthly quinolone use was always below 20% (200/1000 index visit). In Figure 2 it was even lower. Any explanation?

5) In the chart review cohort, the proportional distribution of the 4 infections and consequently the AB use rates) differed substantially from the administrative data cohorts’ data. Therefore the chart review sample was not representative. The other interesting thing that in the chart review cohort the share of URTI was much higher (69,6% vs. 46,8% in Table 1) but NO antibiotic use occured in smaller proportion (31,9% vs. 50,5 %). This finding is strange (I would expect the opposite) as URTI is the only infection type from the 4 one that do not require AB use due to its mainly viral origin. Could you explain this finding?

6) levofloxacin not levafloxacin

7) Durbin-Watson not Durbin-Wason

8) …with abilling claim for an infection of interest in fact had one of the…..

9) In table : not ofloxacin but gatifloxacin was added to the formulary as a new.

10) Tables and Figures should be understandable without reading the text. So please write the full term of acronyms (IQR, AECB, abx, etc…) under the tables/figures.

11) There is only 3 figure legend but there are 4 figures. Therefore the legends do not pass to the figures. Figure 2 is probably Figure 1, panel B.

Discretionary Revisions

1) I would recommend to standardize for 100 unique index visits instead of 1000. Then you see the changes in %. Also the figures would be more easy to follow.

2) Would be a good quality indicator to see in how many % of visits for URTIs resulted in AB prescription. Stratification by infection type in Table 1 would be nice

3) There were 436,888 doctor visit and 397,534 unique index visit, meaning that the difference (39,354 cases, ~10%) a repeated visit with the same condition (infection type) happened within 30 days. As all this nearly 39500 re-visits followed an AB prescribing visit (20% of 196,740) means that revisiting mainly occurred due to ineffective first AB treatment (not due to the watchful waiting behaviour of doctors when not prescribe AB at the first visit but call-back the patient - good practise in case of URTI). This should be emphasized in the text.

Level of interest: An article of importance in its field

Quality of written English: Acceptable

Statistical review: No, the manuscript does not need to be seen by a statistician.

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