Author's response to reviews

Title: Impact of treatment policies on patient outcomes and resource utilization in acute cholecystitis in Japanese hospitals

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Dear Editors:

We are very grateful for the opportunity to submit our revised manuscript entitled "Impact of treatment policies on patient outcomes and resource utilization in acute cholecystitis in Japanese hospitals" (MS-ID: 1124466370860534) for publication in BMC Health Services Research. Enclosed, please find a copy of our manuscript, which has been revised in accordance with the reviewers' comments. Below, we provide a detailed list of the revisions that have been incorporated into the manuscript.

1. The Introduction was revised according to Dr. Nilsson's suggestion.
2. We updated the evidence regarding randomized clinical trials comparing laparoscopic cholecystectomy (LC) and open cholecystectomy (OC) in acute cholecystitis (in both the Introduction and in the first paragraph of the Discussion).
3. The selection of the participants was described in the Methods. All of the hospitals are members of the QIP project, and participation in the study was voluntary. However, the member hospitals are located across Japan.
4. The description of the inclusion and exclusion criteria was incorrect. In reality, we did not exclude cases with acute pancreatitis or acute cholangitis. Therefore, we corrected the description of the exclusion criteria. (in the second paragraph of the "Subjects and database" subsection of the Subjects and Methods). The impact of these two factors on physicians' selection of LC, as well as on patient outcomes, was also investigated.
5. In the second paragraph of the Results, we show the results of a logistic regression identifying factors associated with the selection of LC, according to Dr. Carbonell's request.
6. Dr. Nilsson pointed out the importance of the finding that a higher incidence of intra-operative complication was observed in cases for which LC was initially attempted when compared to cases that requested OC, and that we must provide an interpretation. According to this suggestion, we added a description of such intra-operative complication (in the "Relationship between laparoscopic use and clinical outcomes in patient-level analysis" subsection of the Results, and in the second paragraph of the Discussion)
7. According to Dr. Carbonell's comment that the 2nd and 3rd panels of Figure 1 do not contribute to the understanding of the data, we deleted these panels from the figure.
8. As Dr. Tsuyuguchi suggested, the prevalence of preoperative ERCP was significantly higher among hospitals with high use of LC (in the last paragraph of the Results). Unfortunately, data for preoperative examination costs were not available; thus, we could not analyze the impact of this strategy (LC+ERCP) on examination costs.
9. Although mini-cholecystectomy is a safe and inexpensive approach, which is comparable to LC in terms of less postoperative morbidity and pain, the study subjects of the clinical trials that compared mini-cholecystectomy with LC are not limited to individuals with acute cholecystitis, and we consider that the evidence can not be generalized to our study subjects. Moreover, as this approach is not popular in Japan, our study can not address the effectiveness of this modality. However, we mentioned the possibility...
of this approach as an excellent modality, which may take the place of LC (in the 4th paragraph of the Discussion).

10. We discussed fast-track surgery as a possible confounding factor, which could jeopardize interpretation of the effectiveness of laparoscopic surgery (in the 5th paragraph of the Discussion).

11. In the 7th paragraph of the Discussion, we added a description in order to explain why the length of hospital stay is remarkably long in Japan.

12. As Dr. Tsuyuguchi suggested, some patients were discharged from the hospital for delayed elective surgery. We collected information regarding not only admissions due to the onset of acute cholecystitis, but also all subsequent admissions, including those for delayed elective surgery. Length of hospitalization and medical charges were summed across these admissions.

13. Although small-incision operation is a promising approach that might take the place of LC in the future, our study did not directly investigate this modality. Therefore, as our cases had remarkably long preoperative length of stay, we consider that changing the treatment policy from delayed surgery to early surgery should remarkably reduce the overall length of hospitalization.

This research was conducted with the cooperation of the QIP Cholecystectomy Expert Group which consists of 17 physicians of the participant hospitals. Would you please allow us to include the name of the group at the end of the authors’ list in the manuscript? And if possible, would you please list the name of these names in the first page of the article? We included the names and the affiliations of the each member in Acknowledgement.

We hope that these revisions satisfy the reviewers’ concerns and that the manuscript is now acceptable for publication. If you have any questions about the manuscript, please contact Dr. Miho Sekimoto. We are looking forward to your reply.

Sincerely yours,

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