Reviewer's report

Title: Severe inflammatory reaction induced by peritoneal trauma is the key driving mechanism of postoperative adhesion formation

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Reviewer: Maria Mercedes Binda

Reviewer's report:

It is a very interesting manuscript comparing inflammatory parameters and postoperative adhesions in both OS and LS rat models.

1) First paragraph of introduction: References should appear in order starting from 1 and not (2,3, 27, 30, 32).

2) Last sentence of last paragraph of introduction:
   a) I think the aim of the study is not clear. In my opinion, the aim of this study (as written on the title) is to study the adhesion formation and inflammation parameters during OS and LS in a rat model. In my opinion, it should be written clearly.

3) M&M: Experimental design:
   a) I would not call it "double blind randomization", rats were allocated blindly or blinded randomized into OS or LS. I would say who was blinded for what. For instance, the rats were blindly randomized for OS or LS and the person who did the scoring of the adhesions and/or inflammatory parameters was blinded for the group which was evaluated. The surgeon can't be blind for the type of surgery (OS or LS) performed.

   b) Age of the rats?

   c) The authors said that 19 rats died. The surgery looks very traumatic to produce such a high mortality. With such a high mortality, is this a good animal model to study OS and LS? Please comment on that.

   d) To avoid variability: was the surgery performed by the same surgeon? Were the postsurgical adhesion and/or the inflammation scoring evaluated by the same person?

4) Surgical protocol:
   Was the MLI kept just opened or was that kept opened with the help of a tool (forceps, retractor, etc). Please write it down.

5) CO2 pneumoperitoneum set up: This section is not clear. Please rewrite it.

   a) "This setup is included the humidifier and heating device with thermometer and the excess water reservoir (5-7)."
Where is the heating device in the figure? Please indicate with the number. The humidifier is number 6?
What is 5?
Water reservoir is number 8, right?

I would write it like: “This setup is included the humidifier (6) and heating device (?) with thermometer (7) and the excess water reservoir (8). “
b) With which material was the tubing done? Can it loose temperature? Was the tubing isolated?
c) “The temperature in this system was kept at 35-37°”. How was done that? Was the temperature and humidification of the insufflation gas measured at 9 and/or 10?.
d) “Insufflation pressure was controlled with two water valves. The first water valve (see 3) was situated next to the CO2 balloon and controlled the system pressure (setup)”. The First water valve is number 4 as written before. Please change 3 to 4
e) What is 12? It is also a 0.3 cm catheter? Please write it down.

6) Evaluation of macroscopic changes and adhesion formation
a) The authors said that percentage of the adhesions were 25%, 50%, 75% or 100%. And what happen if the size was 35% of the lesion? How was that scored? Was not possible to measure the total size of the lesion (normally 2 cm) and the exact mm of the tissue attached?
b) It is not clear how the author got the total inflammation score for each rat. I suppose that the individual inflammation parameter scores were added. This should be written clearly.

7) Table 1 is explained in the text, I don’t think it is necessary

8) Table 3 is nice but it is better to include it in the discussion.

9) If authors wanted to compare OS and LS which is the added value of the MLI in the LS Group? Like this the LS group has the trauma of the OS (the MLI) and of the insufflation gas.

10) Results:
a) I would not include questions in the results section. This section should give the results such as. Questions or hypothesis better go to aims.
b) Last paragraph of the results must go to the statistic section in M&M

11) Figure 4 is nice but it can be included in the discussion.

12) Discussion:
a) I found the following sentence too strong: “Subsequently all other gases could
not be considered safe for pneumoperitoneum because of their accumulation during laparoscopy and unexpected consequences during and after surgery”

I think if it is proven that other gases are not accumulated in the body and/or are easily removed from the body, they can also be considered to induce the pneumoperitoneum.

13) A few typing mistakes:
a) Title: “Inflammatory” instead of “inflammattory”
b) Table 2: “scores” not “scorres”

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'