Reviewer's report

Title: Sensitivity of intra-abdominal, intra-organ and intravascular pressures in detecting changes induced by external abdominal pressure with and without PEEP: an experimental study

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Reviewer: Franco Valenza

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Major
The one presented by Jakob et al. is an interesting manuscript. However, according to this reviewer, there are major criticism that limit its clinical relevance: namely the absolute values of pressure investigated and the decision to use an external weight.

The values of pressure reached during the so called IAP were rather low. What is the scenario the authors are thinking of when they investigated IAP of 7-13mmHg? Why did they decided to investigate the interaction between IAP and PEEP in such a condition? This does not emerge from their manuscript.

This is particularly relevant if one consider the decision to use an external weight to rise IAP. Why ? Why 7 kg? What is the relevance of this means of rising IAP to any to clinical scenario? On Pag.9 they write: “ in one animal intraperitoneal pressure did not increase after applying external weight onto the abdomen;....” How do the authors explain such a finding? From a methodological point of view, this adds uncertainty to the following measurements presented.

Moreover, in both Figure 1 and 2, one animal showed a decrease of pressure with increased IAP: Why? Did this happen always in the same animal? How do the authors explain such a finding? Did this affect the statistics? This need to be discussed in the manuscript.

Was the application of PEEP-weight presented on pag. 8, random? This is unclear and need to be declared.

Minor
There are sentences that need to be better supported and explained:
Pag. 12: “ Accordingly, our results do not support the use of higher filling pressure targets in situations with borderline IAH”

Pag.12: “While the increase in intravascular pressure is the result of increased pressure around the vessels in the former situation, it is a consequence of intravascular pressure transmission in the latter.”

Table 1: data from the different groups are missing. Their presentation would add to clearness.
Authors refer in the title of their manuscript, in the abstract (introduction, conclusion (pg.2-3) and in the discussion (pag.5), that they investigated “changes induced by…..”. However, in the manuscript they never present true changes, conversely they present absolute values. When comparing different methods of measurements, this may be of relevance. Authors should either change sentences or data presentation.

Authors claim in the title of the manuscript, in the abstract and in the introduction (pag.2) that they investigated the “sensitivity” of different systems to measure IAP. However, they never showed any data related to sensitivity. They should probably either omit the word or add specific data.

Abstract: the type of investigation is missing. So is the animal species used.

pag.4 intro: “direct measurement of IAP is difficult and invasive ……..” This seem a rather strange sentence. Do the authors believe so?

What do the authors mean by:
“lower and upper abdominal pressures” (Pag. 5).
"position of the catheters checked by palpation” (Pag.7)

Repetition: Pag.7: “for further analysis….. for later analysis”

Discrepancy: Pag.11 : ACS definition: 20 mmHg on pag 4, 25 in the introduction.
Pag.11: „... 10 cmH2= of PEEP had no significant effect OF the relationship…..”

Pag.14: The role of J Takala in the manuscript is missing.

Figure 1 and Figure 2: too small, hard to read.

**Level of interest:** An article of limited interest

**Quality of written English:** Needs some language corrections before being published

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

**Declaration of competing interests:**

declare that I have no competing interests'