Author's response to reviews

Title: Could the use of bedside lung ultrasound reduce the number of chest X-rays in the Intensive Care Unit?

Authors:

Etrusca Brogi (etruscabrogi@gmail.com)
elena bignami (bignami.elena@hsr.it)
Anna Sidoti (anna.sidoti1@gmail.com)
Mohammed Shawar (forforiden@libero.it)
Luna Gargani (lunagargani@gmail.com)
Luigi Vetrugno (vetrugno.luigi@aoud.sanita.fvg.it)
Giovanni Volpicelli (giovi.volpicelli@gmail.com)
Francesco Forfori (francescoforfori@gmail.com)

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Cover letter

Dr Bignami Elena
Department of Anaesthesia and Intensive Care
IRCCS San Raffaele
Scientific Institute
Milan Italy

Pisa, 30th of August 2017

Dear Dr. Rosa Sicari,

I wish to submit the revised version of the manuscript entitled Could the use of bedside lung ultrasound reduce the number of chest X-rays in the Intensive Care Unit? ” for consideration by Cardiovascular Ultrasound.
We appreciate the thorough review of our manuscript and for the helpful comments provided by the reviewers. We have tried to address all the issues raised in the extensive review below. Please find a copy of each reviewer’s comments, along with a point-by-point response in bold font:

“Reviewer reports:


Reply:

We are grateful to the reviewer for the suggestion. We read the suggested reference and found it very interesting. We added the recommended reference on page 4.

Page 7, line 40: It would be useful to better describe the scanning technique: which probe has been used and what type of scan (longitudinal or transversal). Have you collected data on LUS scores?

Have you adopted a protocol to decide when to perform Chest Xrays after 2012? Have you reported your LUS findings in the clinical notes or in a dedicated sheet? It would be useful to know better your decision algorithm. Even if the study is retrospective and it’s difficult to obtain data on LUS technique, any information would be useful to understand how LUS has been implemented in your everyday clinical practice.

Reply:

We are grateful to the reviewer for having pointed out this aspect. We are aware that a lot of differences in performing the LUS exist from one country to the other, from one hospital to another. Even more, no standardized methodology for LUS examination in ICU is univocally accepted. Consequently, We understand your concern; we modified the method section as requests (please find highlighted in green page 6 and 7) and added the following sentences:

“During that period, the first methodological imaging technique of choice was LUS, then, in case of clinical doubt or technical problems, X- Rays were used to overcome the issue”

“A microconvex probe was used as the first choice for LUS. Then, to help resolve cases where diagnostic doubt remains, higher frequency probes were chosen for a better visualisation of the pleural line and subpleural space. The probe was positioned longitudinally in order to visualise the “bat sign” (the pleural line and two ribs), then placed in transversal plane”.

We recorded our LUS finding in the clinical notes however, we did not use dedicated sheets. Consequently, the majority of data that we are able to extract from these documents were about
the performance of LUS scan or other imaging techniques. We are able to extract only few data on the clinical nature of the imaging techniques.

Unfortunately, we did not collect the LUS score. We highly appreciate your suggestion and we are willing to implement these aforementioned documents in our daily clinical practice.

Page 8, line 38-39: It would be of interest to know how many chest x-rays were normal and how many were pathological in the two groups because the actual reduction in Chest x-rays could be mainly a reduction of normal scans, suggesting that the issue was that too many "useless" x-rays were performed in the group A, and LUS allows in an initial phase to reduce these scans, rather than helping in the pathological diagnostic process. In any case, the contribution of LUS would be significant and useful, this suggestion is just to promote a better understanding of the LUS acquisition process in the clinical practice.

Reply:

We are grateful to the reviewer for the opportunity to address this comment. Unfortunately we are unable to provide such information. Due to the retrospective nature of the study, it was not possible to gather such information for a great part of the participants. Consequently, we obtained only partial information, not suitable to add in the study. We believe that this aspect represents a limitation of our study and consequently, we added the following sentence in the discussion (please find highlighted in green page 11): “For the same reason, it was not possible to evaluate how many chest x-rays or LUS examinations were normal and how many were pathological in the two groups”.

We appreciated your comments and realized that probably, as you pointed out, the reduction in Chest x-rays in our study could be mainly a reduction of normal scans, suggesting that the issue was that too many "useless" x-rays were performed in the group A, and LUS allows in an initial phase to reduce these scans, rather than helping in the pathological diagnostic process.

Page 11, line17: Have you observed any changings in the number of performed CT scans in the two groups? It would be interesting to know it.

Reply:

We are grateful to the reviewer for having pointed out this aspect. We add the number of CT scan in Table 1 and added the following sentence in the discussion section: “We did not find a decrease in the number of chest CT scans between the groups” (please find highlighted in green page 8).

Page12, line20: Do you have any data about LUS in your patients? Can you tell if LUS were normal/pathological? It would be interesting to compare LUS and X-rays in your cohorts to better understand if the X-rays reduction was mainly due to normal X-rays reduction or not.

Reply:
This is a really remarkable observation. As aforementioned explained for Chest X rays, we are unable to provide such information. Due to the retrospective nature of the study, it was not possible to gather such information for a great part of the participants. Consequently, we gather only partial information, not suitable to add in the study.

Table 1: The high number of surgical admissions suggest that the potential application of a standardized protocol for LUS application and Chest X-rays avoidance in your reality is feasible. For short ICU stays, where X-rays are often routinely performed just before patients' transfer, it could be of high significance and also interesting for a prospective study.

Moreover, I would add an ICU duration stay line.

Reply:

We are grateful to the reviewer for the opportunity to address this comment. We add the ICU stay in Table 1. Even more, we added the following sentences in the discussion: “The overwhelming majority of our sample consisted of surgical patients requiring a brief postoperative intensive care monitoring. For short ICU stays, the implementation of LUS seems of high significance, because, conventionally, X-rays are often routinely performed just before patients' transfer.” (Please find highlighted in green page 8).

In conclusion, we hope that our modifications have addressed all the issues raised in your informative and thorough review of our paper. We would be glad to make further changes upon request. On behalf of the other authors, I extend my gratitude for your time and assistance with our review. I look forward to hearing your response.

Please address all correspondence concerning this manuscript to me at bignami.elena@hsr.it

Thank you for your consideration of this manuscript.

Sincerely,

Dr. Bignami Elena (corresponding author)