Reviewer’s report

Title: Impact of positive chest X-ray findings and blood cultures on adverse outcomes following hospitalized pneumococcal lower respiratory tract infection: A population-based cohort study

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Reviewer: James D Chalmers

Reviewer’s report:

This study investigates differences in clinical outcomes between pneumococcal pneumonia, bacteremia and a third group without radiological infiltrates on CXR and without bacteremia. The main question can be summarised as “does a positive sputum culture for S.pneumoniae with LRTI symptoms but without chest x-ray changes equate to pneumonia”. The answer from the authors is…not quite. The group still has a significant mortality but lower than the group with infiltrates. The main strengths of the study are the large sample size and a rich, highly detailed clinical database.

The main difficulty is in defining who the group with no pneumonia and no bacteremia were- what were the clinical diagnoses in this group (acute bronchitis, exacerbation of obstructive lung disease or other?). Pneumonia and bacteremia are very well defined clinical groups while the third group are likely to be a mix of different disorders and so are much more difficult to analyse in a meaningful way. For example, can the authors show the primary diagnoses based on their ICD-10 coding, or chart review. It seems some did not even receive antibiotics- is this the case?

When the authors say “lower respiratory tract infection (LRTI) without positive chest X-ray findings and blood cultures” do they mean a positive sputum culture for S.pneumoniae or were other positive samples included e.g throat swabs/BAL etc? Confirm that urine antigen testing was not part of the identification process here. Please specify where the isolates from “LRT” were- presumably this is mostly sputum but please provide % from sputum, BAL or other sources ??throat swabs

Can the authors think of better abbreviations that nPnB, PnB and B or explain them more clearly. I kept thinking PnB should stand for pneumococcal bacteremia, when this is actually the group pneumococcal pneumonia with x-ray changes (I guess it stands for pneumonia no bacteremia, but then some of the B patients must also have pulmonary infiltrates). This is really confusing for me and I have to keep checking back to the abstract to confirm which group is which.

It is not clear why the authors excluded 35 patients without chest x-ray changes who did not have raised CRP or WCC. Can the authors explain why this group were excluded?
Can the authors be more clear in the discussion on the clinical implications of these findings? When we see patients initially, we will not have sputum culture results available to know they have S. pneumoniae. Would these results change your approach to patients with LRTI symptoms but no chest x-ray changes?

In summary, a great database, a good analysis, but the clinical importance of this third group needs to be clarified.

Level of interest: An article whose findings are important to those with closely related research interests

Quality of written English: Acceptable

Statistical review: Yes, and I have assessed the statistics in my report.

Declaration of competing interests:

i declare that i have no competing interests