Reviewer's report

Title: Inadequate treatment of ventilator-associated and hospital-acquired pneumonia: Risk factors and impact on outcomes

Version: 1 Date: 23 April 2012

Reviewer: Nele Brusselaers

Reviewer's report:

This is a well-written and designed article of Piskin et al, considering inadequate antimicrobial treatment in HAP and VAP, which remains a complicated and often controversial problem. It is remarkable that international guidelines seem to fail often when implemented in real-life clinical practice (difference in efficacy-effectiveness, or is the problem just to complicated to fit in one set of guidelines???).

I do have a couple of suggestions, and a few queries

Major
- Was there a difference in antimicrobial efficacy in polymicrobial cases vs. mono-microbial cases? I suppose the ‘bad’ results might be overestimated by considering an episode as inadequately covered if one microorganism is covered, and another isn’t? Please discuss…

- It’s quite remarkable that episodes of culture-negative pneumonia do have a higher proportion of adequate therapy. Could this be due to over-diagnosis of pneumonia (ascertainment bias)? If it’s not really pneumonia, it might be expected that the patient will improves clinically (maybe even without antibiotics???). I would suggest to report the data to illustrate the difference between culture pos/neg (which you mention in the discussion as not being different).

- Did your findings chance your antimicrobial practice? Do you have recommendations to improve the initial antimicrobial coverage? (routine surveillance cultures, taking into account local ecology by surveillance programs, not using/changing the international guidelines?) Please discuss…

Minor essential
- Definition of inappropriate antibiotic therapy: I noticed that you have a quite high proportion of culture negative HAP and VAP (please add the exact number for the VAP cases, as well as the % polymicrobial). Please clarify in the methods, that this considers the initial antimicrobial therapy (probably first 24h-48h until culture results are known).

- Did you consider all identified microorganisms as causal pathogen, or did you exclude organisms such as Candida, CNS, ‘mouth flora’ which could be identified
in the laboratory… Yet, these are probably (except for Candida) covered by the antimicrobial regimen. Please clarify this in the methods…

- I also wondered if there was a difference if you don’t include sputum cultures, which might give more false positives (representing colonisation instead of infection/pneumonia). Please clarify which diagnostic techniques were used in which indication: Was EA and/or BAL performed in all VAP cases? Was EA/BAL ever performed in HAP cases? Sputum cultures are probably less specific…

- Remarkable finding: for HAP, a twice higher proportion of appropriate treatment was seen on surgical wards (absolute proportions), and for VAP a 2-times lower odds in the multivariate analyses. Do you have an explanation?

- Did you see any difference for the HAP patients admitted to the ICU or to other wards? I suppose it’s quite a high proportion at the ICU, because the overall mortality of HAP seems quite high?

- I suppose you only took into account the first episode of pneumonia? (please clarify in methods)

Discretionary revisions:
- In table 5: correct ‘entubation’ -> ‘intubation’.
- In the first sentence of the discussion, the verb is missing between AB and based.
- In the introduction, the sentence on prevalence should be written clearly. E.g. does the reported mortality represent VAP only or VAP/HAP (so what’s the mortality of HAP?)

**Level of interest:** An article of importance in its field

**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