Reviewer's report

Title: Patient characteristics but not virulence factors discriminate between asymptomatic and symptomatic E. coli bacteriuria in the hospital

Version: 2 Date: 12 February 2013

Reviewer: Par-Daniel Sundvall

Reviewer's report:

1. Is the question posed by the authors well defined?
The aim/questions are well defined by the authors.

2. Are the methods appropriate and well described?
This is a prospective cohort study of patients with E. coli bacteriuria from August 1, 2009 to July 31, 2010 at a 1250-bed teaching hospital. All adult patients admitted to the hospital that presented with E. coli bacteriuria at time of admission, or developed it subsequently were considered for enrolment. The study analyzed patient and pathogen factors associated with asymptomatic versus symptomatic E. coli bacteriuria. The study concludes that asymptomatic E. coli bacteriuria in hospitalized patients was frequent and more common in patients with dementia and chronic pulmonary disease. Bacterial virulence factors could not discriminate symptomatic from asymptomatic bacteriuria.

Major compulsory revisions

Those classified as asymptomatic bacteriuria (ASB) in the study had no symptoms of cystitis and no symptoms of pyelonephritis. Why had the clinician ordered a urinary culture? It might be a selection bias in this prospective study as urine cultures were taken at the discretion of treating physicians and not from everyone admitted to the hospital. If a urine culture had been taken from everyone admitted to the hospital, there would have been many more patients with ASB. It’s not unlikely that patient characteristics among those patients could be different compared to patients where the clinician for some reason took a urine culture in the absence of urinary tract symptoms.

During the entire year, there were only 70 patients with cystitis symptoms and E. coli in the urine. This seems to be a small number at a 1250-bed hospital. (Totally there were 337 patients with E. coli bacteriuria, 50 were excluded as they were considered unclassifiable, 110 had ASB, 107 had pyelonephritis and 70 had cystitis.) Why are these numbers so low? Are there other urine cultures taken at the hospital, but not included in this prospective study? Were treating physicians just taking urine cultures sporadically when patients presented with cystitis symptoms? Either of these explanations could affect the selection of studied subjects in a way that could possibly affect the results of the study.

According to methods, presence of dysuria, frequency, urinary retention or lower
abdominal pain was classified as cystitis symptoms. There is no information on time aspects and number of symptom required for being classified as having cystitis. Especially among elderly people there are many other causes to these symptoms, especially if not of recent onset, i.e. prostatic hyperplasia and genitor-urinary symptoms associated with oestrogen-deficiency states. Depending on which definition used, patients with ASB could be misclassified as cystitis if having urinary symptoms caused by something other than E. coli in the urine.

There is no information about the number of urine samples cultured during the year of the study. What was the distribution between urine cultures positive/negative for E. coli?

Is it possible that single patients could be included more than once in the study, if readmitted to the hospital?

3. Are the data sound?
It is not stated how patients were selected for a urine sample. Due to possible selection bias, the comparison between symptomatic and asymptomatic patients with E. coli could rather be a comparison between the following two groups; E. coli bacteriuric patients with UTI symptoms and a complicated group of patients that the clinicians didn’t know how to handle (as they took urine cultures in the absence of UTI symptoms).

4. Does the manuscript adhere to the relevant standards for reporting and data deposition?
Yes.

5. Are the discussion and conclusions well balanced and adequately supported by the data?
Due to possible selection biases and a difficulty to define a true UTI versus ASB, the conclusions might be incorrect.

6. Are limitations of the work clearly stated?
The possible selection biases (mentioned above) are not clearly stated in the manuscript. Other limitations of the work are however clearly stated.

7. Do the authors clearly acknowledge any work upon which they are building, both published and unpublished?
Yes.

8. Do the title and abstract accurately convey what has been found?
Yes.

9. Is the writing acceptable?
Yes.
**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.