Reviewer's report

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

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Reviewer: Jean-Philippe Lavigne

Reviewer's report:

The manuscript by Marschall et al. present two risk factors associated with asymptomatic E. coli bacteriuria in patients. Generally, the manuscript is well-written but the study design is not clear including exclusively one centre and some important experiments are not performed.

Major Compulsory Revisions

The manuscript has some major biases in the goal of the study:

-Ln 67-69 and Ln 204-206: The objective of the study was to develop a bedsides test to distinguish ASB from UTI... I don't understand the interest of this test. To distinguish ASB and UTI, you can use clinical signs... and except for some clear criteria (e.g. pregnancy...), no antibiotic treatment must be prescribed. So why would the authors develop a test? Please clarify.

-Moreover the study is monocentric and concerned a specific population (elderly patients). It's very difficult to interpret the results and generalize these data in other Centres.

-The recruitment of ASB and UTI is unclear. Which patients were screened? All the patients in the Center or some patients? What are the criteria the authors used to screen asymptomatic patients? Are prostatitis excluded? If so, please indicate and explain why. I don't understand the strategy of blood cultures. All the patients with UTI and fever had not blood cultures and patients with ASB had blood cultures. Could you explain? One patient with ASB presented a blood culture + with E. coli: how the authors could excluded a pyelonephritis in this case?

-Some major virulence factors are not screened in this study (notably adhesins genes: papGII, papGIII, papA...). It's well established that these genes are involved in UTI and could discriminate cystitis, pyelonephritis and ASB. See for example Lavigne JP et al., J Clin Microbiol 2011). The phylogenetic groups and serotyping are also very important in the analysis of E. coli virulence. These criteria are absent in this study. Moreover, the interpretation of the results is not surprising. Many publications showed that E. coli strains belonging to B2 or D phylotyping groups have a real potential of virulence and could induce UTI (Please see different articles on ASB and pregnancy). So the fact that no difference could be found between strains isolated from ASB and UTI is not surprising: the only difference is the genes expression. The authors must describe the phylotypes of the strains and perform clonality research (PFGE) to
see if the strains are identical or not.

Minor Essential Revisions
I have some others concerns about this study.

-Ln.30: Please indicate the location where the study was conducted.
-Ln. 53: ASB screening is also recommended in immunocompromised patients.
-Ln 76-77: Data of nosocomial and community origins are mixed. This could induce a bias in data interpretation. Moreover the definition of community-acquired UTI is not correct. You must include in nosocomial infections all patients who had a link with healthcare system (e.g. Institution, Long-term care, etc).
-Ln. 121-122 and Ln 170-173: The results must be presented in the Table 1 and discussed. The level of ciprofloxacin resistance is particularly high in this Centre. Please explain.
-Ln. 137-139: The authors must record the patients’ signature.
-Ln. 143: I strongly recommend that the authors add a flowchart.
-Ln. 159: “patients with symptomatic UTI were more likely to be neutropenic”. It would be interesting to know the leukocyturia in urines samples of these patients. The detection of this criterion is very easy (e.g. dipstick), low cost and could represent a solution in this population (if I follow the goal of this study).
-Ln 214-215: The link between chronic pulmonary disease and ASB could be exclusively due to a bias in the recruitment (with an elderly population which presented this comorbidity).
-The references are not updated. To improve discussion, please see for example: Ragnarsdottir B et al., Pediatr Nephrol 2012 (the authors observed some virulence factors and host markers which are involved in risk factors of UTI or ASB); Hawn TR et al., PLoS One 2009 (the authors show a relation between genetic factors and UTI/ASB – in response to Ln 246-248); Ariathianto Y, Aust Fam Physician 2011 (the author identified dementia as a risk factor of ASB – in response to Ln 213); Juthani-Mehta M, Clin Geriatr Med 2007 (the author wrote a review on ASB and UTI in elderly population)

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

**Quality of written English:** Acceptable

**Statistical review:** Yes, but I do not feel adequately qualified to assess the statistics.

**Declaration of competing interests:**

I declare that I have no competing interests’ below.