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Title: Testing for asymptomatic bacteriuria in pregnancy

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Dear Editor

We found that testing practices for asymptomatic bacteriuria (ASB) in England are variable between hospitals, and that over testing for ASB is common.

Untreated ASB in pregnancy is associated with an increased risk of pyelonephritis [1]. ASB screening and antibiotic treatment has been reported to be effective in reducing this risk [1]. On this basis the UK National Screening Committee considered introducing a population level ASB screening programme. Their evidence assessment identified a lack of data relating to current ASB testing practices. We therefore carried out an audit of practice in England using standards based on national guidance [2] and current clinical standards [1]. Practice against these standards was assessed by questionnaire. We contacted antenatal screening staff with an e-mail request to complete the questionnaire in 2015. The questionnaire asked 16 questions related to ASB testing. These questions and answers are provided in Table 1, with the audit standard highlighted in bold. Eighteen hospitals responded to the questionnaire, after e-mailing the questionnaire to approximately 100 hospitals. Most centres complied with national recommendations to offer screening for ASB by mid-stream urine at pregnancy booking visits which are normally scheduled in weeks 8-12 of pregnancy. Beyond this the standards set were generally not well attained. For example, the standard of repeat testing to confirm ASB, based on the Infectious Disease Society of America's clinical guidance for investigation of ASB, was infrequently carried out (30%). Most patients who were treated for ASB were not re-tested (18%). Beyond the booking visit, in women who did not initially have ASB there were a proportion of responders (35%) who re-tested for ASB using dipstick tests despite the absence of guidance to do so. Although national guidelines recommend re-testing for ASB after initial treatment for ASB, we are not aware of guidance for routine re-testing for ASB after an initial negative test [[1],[2]]. In other antenatal practice, when pre-eclampsia was screened for in pregnancy and proteinuria found, all respondents reported that they would always or sometimes investigate for ASB, despite the lack of evidence of an association between asymptomatic UTI and proteinuria [3]. This unnecessary ASB screening has significant cost implications. Given there are approximately 700,000 births each year in the United Kingdom (Office for National Statistics 2014), and proteinuria is repeatedly tested for in pregnancy (United Kingdom guidelines recommend ten occasions for screening), with proteinuria identified in approximately 10% of patients, this could result in an estimated 70,000 urine samples being submitted for microbiological testing at a cost of £700,000 (estimations, 1 urine sample per pregnancy in the estimated 10% with proteinuria, £10 per MSU) with additional antibiotic prescribing also resulting [[2],[4]]. The potential benefits of treating patients with proteinuria and bacteriuria with antibiotics must also be put into context. Recent literature concerning ASB screening in pregnancy determined that routine screening for ASB had limited clinical impact, preventing only one case of pyelonephritis per 1000 screened women [5]. It was suggested that with changes in social attitudes to screening in pregnancy between the 1960s and now, that access to urinary tract infection treatment prevents the development of pyelonephritis at the high rates seen in the 1960s [5].

In conclusion, we have identified that national guidance relating to initial ASB screening is generally followed. Unfortunately, outside of the booking visit, in the absence of specific national guidance, testing for ASB is potentially leading to high laboratory costs and unnecessary antibiotic prescribing. We recommend that national bodies update guidance such that they specifically state: In women

without ASB at their initial screen further screening for ASB should not be undertaken and that proteinuria is not an indication for ASB screening.

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Table 1: Questions and answers to an audit into testing for asymptomatic bacteriuria in English Hospitals. Answers consistent with audit standards are highlighted in bold.

Questions	Answer Options	Replies
1. Does your department have a guideline recommending screening for Asymptomatic Bacteriuria in pregnancy at a patient's booking visit?	Yes No	17 (94%) 1 (6%)
2. What is your main method of screening for Asymptomatic Bacteriuria at a patient's booking visit?	Urine dipstick (multistick) Urine dipstick (albustick) Mid-stream urine culture (MSU) None, we don't screen for Asymptomatic Bacteriuria at a patient's booking visit	1 (6%) 0 16 (89%) 1 (6%)
3. If urine dipstick is your main method of screening at booking visits, do you confirm positive dipsticks with urine culture before antibiotic treatment?	Yes No Not applicable, we don't use urine dipsticks	1 (7%) 0 14 (93%)
4. If you were interpreting a urine dipstick for Asymptomatic Bacteriuria, which of the following results would you consider a positive result (select all answers that apply)?	Blood Leucocyte Nitrite Protein I don't know Not applicable	6 (35%) 4 (24%) 6 (35%) 6 (35%) 0 10 (59%)
5. Do you have a departmental guideline which details how to interpret a urine dipstick for Asymptomatic Bacteriuria?	Yes No Not applicable, we don't use urine dipsticks to screen for Asymptomatic Bacteriuria	1 (6%) 3 (17%) 14 (78%)
6. In an asymptomatic (no urinary symptoms) pregnant patient with a single positive E.coli urine culture, do you have guidelines recommending a second (confirmation) urine culture before antibiotic treatment?	Yes, our guidelines recommend we confirm before treating We have guidelines which sometimes recommend confirming before treating No, our guidelines don't recommend we confirm before treating	2 (12%) 3 (18%) 12 (71%)
7. Roughly, what percentage of service users would you say you screen for Asymptomatic Bacteriuria?	<5% 5-20% 21- 40% 41-60% 61-80% 81- 95% 95-100%	0 2 (12%) 0 0 0 1 (6%) 17 (82%)
8. In a women who does not have asymptomatic bacteriuria on their booking visit, do you routinely rescreen?	Yes No	6 (35%) 12 (71%)
9. At which visits do you re-screen?	Midwife home visits Hospital clinic visits	6 (86%) 6 (86%)
10. Which test do you use to re-screen women for Asymptomatic Bacteriuria during pregnancy?	Urine dipstick (multistick) Urine dipstick (albustick) Mid-stream urine culture (MSU) None, we don't re-screen for Asymptomatic Bacteriuria	8 (47%) 1 (6%) 3 (18%) 6 (35%)
11. When screening for proteinuria with an albustick urine test, do you normally send an MSU sample to microbiology when proteinuria is identified?	Yes No Sometimes	13 (76%) 0 4 (24%)
12. In a patient diagnosed and treated for Asymptomatic Bacteriuria, do you have guidelines that recommend post antibiotic re-testing for Asymptomatic Bacteriuria?	Yes No	3 (18%) 14 (82%)

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