



Overtreatment of asymptomatic bacteriuria: a qualitative study

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SUMMARY

Background: Overtreatment of asymptomatic bacteriuria (ASB) is widespread and may result in antibiotic side-effects, excess costs to the healthcare system, and may potentially trigger antimicrobial resistance. According to international management guidelines, ASB is not an indication for antibiotic treatment (with few exceptions).

Aim: To determine reasons for using antibiotics to treat ASB in the absence of a treatment indication.

Methods: A qualitative study was conducted at a tertiary care hospital in Switzerland during 2011. We interviewed 21 internal medicine residents and attending physicians selected by purposive sampling, using a semi-structured questionnaire. Responses were analysed in an inductive thematic content approach using dedicated software (MAXQDA®).

Findings: In the 21 interviews, the following thematic rationales for antibiotic overtreatment of ASB were reported (in order of reporting frequency): (i) treating laboratory findings without taking the clinical picture into account ($N = 17$); (ii) psychological factors such as anxiety, overcautiousness, or anticipated positive impact on patient outcomes ($N = 13$); (iii) external pressors such as institutional culture, peer pressure, patient expectation, and excessive workload that interferes with proper decision-making ($N = 9$); (iv) difficulty with interpreting clinical signs and symptoms ($N = 8$).

Conclusion: In this qualitative study we identified both physician-centred factors (e.g. overcautiousness) and external pressors (e.g. excessive workload) as motivators for prescribing unnecessary antibiotics. Also, we interpreted the frequently cited practice of treating asymptomatic patients based on laboratory findings alone as lack of awareness of evidence-based best practices.

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Introduction

The prevalence of asymptomatic bacteriuria (ASB), defined as urine culture with significant bacterial growth in an asymptomatic individual, increases with age and may reach 50% in nursing home residents.¹ By contrast with urinary tract infection (UTI), ASB is not an indication for antibiotic treatment (with very few exceptions).² However, multiple studies

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have shown that at least a third of patients with ASB are unnecessarily treated with antibiotics.^{3–6} This practice corresponds to significant antimicrobial consumption.^{7,8} Consequences of inappropriate antibiotic use include the development of antimicrobial resistance, side-effects of antibiotics, and additional costs to the healthcare system. The 2005 practice guideline by Nicolle and colleagues was an important effort to reduce antibiotic overuse for ASB in that the authors discarded all but two treatment indications (i.e. ASB in pregnancy and ASB in patients about to undergo urogenital surgery).² In the same vein, a recent Infectious Diseases Society of America practice guideline by Hooton and colleagues differentiated between catheter-associated UTI and catheter-associated ASB, and recommended against both screening and antibiotic treatment for the latter.⁹ Regarding UTI management, we know that guideline adherence is a concern.^{10,11} We are, however, unaware of published studies determining the degree of guideline adherence for ASB (i.e. screening, diagnosis, and treatment). In light of the above-mentioned reports on antibiotic overuse, we must assume that ASB guidelines are not well observed.

Very few studies have examined the psychological mechanisms for antibiotic misuse and barriers for guideline implementation. In the long-term care setting, Walker *et al.* identified misleading or non-specific clinical signs, ordering of urine cultures without clear indication, and the lack of education among providers in interpreting urine culture findings as the main contributors towards antibiotic overuse.¹² For the acute care setting, data are lacking. Our objective was to elicit factors that drive antibiotic misuse for ASB in a tertiary care hospital.

Methods

Design, setting, and study population

A qualitative evaluation of physician interviews was conducted using a semi-structured approach. Interviews were performed during November 2011 at Bern University Hospital, a 950-bed tertiary care hospital located in Switzerland, which offers all medical specialties. This hospital operates a large general medicine house staff, which consists of residents and senior physicians who serve general medicine floors and a broad range of medical and surgical subspecialties. For the purpose of this study, we approached 69 physicians (49 residents and 20 senior physicians) based on their availability for interviews. Of these, 21 voluntary participants were recruited (12 residents and nine senior physicians). By purposive sampling, we made sure that both genders and all training levels were represented among the interviewees. The sample size attempted to reach data saturation (i.e. the point where no further material can be obtained) across the full dataset.

Interview structure

We performed case-based, semi-structured, individual interviews with open-ended questions.¹³ In order to elicit information about the motivators for prescribing unnecessary antibiotics for ASB, a case mirroring a typical clinical course was presented to participants at the start of the interviews. The purpose of this case was to serve as discussion basis to

highlight how difficult it is to distinguish UTI from ASB. The interview questions followed a pre-defined 'Topic guide' (Appendix A) and focused on (i) determinants of starting antibiotic treatment for suspected UTI, (ii) knowledge of scientific evidence and resulting evidence-based guidelines and adherence thereto, and (iii) understanding and awareness of the concept of 'asymptomatic bacteriuria'. The topic guide was developed and piloted by one of the authors (M.M.E., fellow in infectious disease) and, to ensure its applicability, subsequently reviewed by an infectious disease senior physician, an epidemiologist, and a behavioural psychologist. Before the interview started, participants were informed that the objective was to understand their knowledge background, management concepts, and behaviour, and we obtained their informed consent. We also reminded participants that their identity would not be revealed outside the research team, and that their responses were stored in an anonymous fashion and not used for individual assessment. Each interview lasted ~30 min, was audio-taped, and then transcribed *verbatim*. Participants confirmed the accuracy of the written transcripts by signature which we kept in our files.

Data analysis

A computer-assisted analysis (MAXQDA[®] software, version 10, VERBI Software Consult Sozialforschung GmbH, Berlin) was undertaken with inductive thematic content approach according to Mayring.¹³ Interview transcripts represented the material in which thematic categories were identified. Coding was inductively created according to new themes emerging from the material. We repeatedly revised the codebook in line with a continuous comparative approach to identify similar or distinct perceptions, attitudes, and experiences. Two data abstractors (M.M.E. and M.L.) systematically coded the material in an independent way. In order to improve the consistency and reliability of the analyses, M.M.E. and M.L. discussed emergent themes between each other; the interpretation ultimately selected was supported by consensus in all cases. For illustration purposes, we extracted typical examples from the material (i.e. 'anchor examples'). Finally, frequency analysis summarized the prevalence of identified codes.

Ethics approval

In consultation with the local ethics committee, formal ethical approval was not required as the study was deemed a quality control project without immediate impact on patient care.

Results

We conducted and analysed a total of 21 interviews with the recruited physicians. The themes used to create categories were: 'Treatment of laboratory results without considering the clinical picture', 'Physician-centred factors', 'External factors', 'Therapy in light of ambiguous or non-attributable signs and symptoms', 'Lack of attention to detail or analytical thinking, particularly under time constraints', and 'Over-treatment due to trivialization of UTI'. We arranged the categories according to the frequency with which they were mentioned (Table I) and their distribution according to the

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