

A qualitative study exploring basis for antibiotics prescription without microbiological investigations, Dar es Salaam Tanzania

Fidelis F. Manyaki

Muhimbili University of Health and Allied Sciences School of Pharmacy

George Bwire (✉ georgebwire@gmail.com)

Muhimbili University of Health and Allied Sciences School of Pharmacy

Liberata Mwita

Muhimbili University of Health and Allied Sciences School of Pharmacy

Raphael Z. Sangeda

Muhimbili University of Health and Allied Sciences School of Pharmacy

Faustine Tungaraza

Muhimbili University of Health and Allied Sciences School of Pharmacy

Augustino S. Kahere

Muhimbili University of Health and Allied Sciences School of Pharmacy

Esther J. Ndegeulaya

Muhimbili University of Health and Allied Sciences School of Pharmacy

Fatuma F. Felician

Muhimbili University of Health and Allied Sciences School of Pharmacy

Manase Kilonzi

Muhimbili University of Health and Allied Sciences School of Pharmacy

Wigilya P. Mikomangwa

Muhimbili University of Health and Allied Sciences School of Pharmacy

Hamu J. Mlyuka

Muhimbili University of Health and Allied Sciences School of Pharmacy

Alphonse I. Marealle

Muhimbili University of Health and Allied Sciences School of Pharmacy

Ritah Mutagonda

Muhimbili University of Health and Allied Sciences School of Pharmacy

Doreen Mloka

Muhimbili University of Health and Allied Sciences School of Pharmacy

Kennedy D. Mwambete

Muhimbili University of Health and Allied Sciences School of Pharmacy

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Abstract

Background Prescription of antibiotics based on microbiological investigations is a commendable rational use of antibiotics and help in fighting the spread of resistance. Although shortage of microbiology laboratory is indicated to impair this practice but prescription without microbiological investigation has been reported even in settings with laboratory facilities.

Methods Semi structured key informant interviews with 31 prescribing medical doctors in Dar es Salaam, Tanzania were conducted from January to June 2019. The purpose of the interviews was to obtain the insight into the prescriptions of antibiotics without microbiological investigations especially in hospitals with laboratory facilities.

Results Majority of participants (26/31) were ready to prescribe antibiotics without microbiological investigations. In addition, a total of four major themes were identified as the basis for this practice; i) clinical condition of the patient ii) past experience with the clinical condition and/or patient iii) an intention to prevent the spread of infection and iv) patient's history and physical examination were adequate to establish the management plan.

Conclusion In recognition of the urgent need to improve antibiotic use in hospitals, this study highlights the need to implement hospital Antibiotic Stewardship Programs in Dar es Salaam, Tanzania.

Background

Antimicrobial resistance i.e. antibiotics poses a serious global threat and raising concern to human, animal, and environment health. [1]. Most of the frequent isolated pathogens are becoming resistant to conventional antimicrobial medicines hence putting the world at an increased risk of morbidity and mortality due resistant bacteria strains [2].

If uncontrolled, antibiotics resistance may not only threaten health of individuals but also results to an increased economic burden through use of expensive medicine and increased number of hospital stay [3]. In this regard, low and middle-income countries (LMICs) including Tanzania which are struggling with severe underfunding and improving their weak health systems are particularly at more risks of antibiotic resistance and its associated problems [4].

At present, there are no doubts on the existence of relationship between the irrational use of antibiotics such as prescription without microbiological investigation and the spread of antibiotic resistance [5]. In combating the problem, World Health Organization (WHO) has continued to recommend the rational use of antibiotics such as prescription based on culture and sensitivity [6]. Furthermore, the national standard treatment guidelines (STGs), Tanzania in particular advocate on evidence based prescription [7].

On the other hand, this practice still faces some challenges especially in resource-limited settings as reported from different studies [4,8–10,11]; these include lack of good facility (microbiology laboratory) [10,12]. However, studies have reported prescription without culture and sensitivity evidences even in settings with facilities [12–16].

For the purpose of exploring the basis of this practice especially in setting with facilities, a qualitative study involving prescribing medical doctors was conducted

Methods

Study design, period and area

The study was conducted using semi-structured key informant interviews where thirty-one prescribing Medical Doctors (MDs) from tertiary hospitals in Dar es Salaam, Tanzania were interviewed in person between January and June 2019. Dar es Salaam region is the business city in Tanzania with approximated population of five million people (almost 10% of the country population) according to the National Census of 2012 [17]. Prescribing MDs included general practitioner, specialist and consultants. The study sites included eight hospitals (four private and public hospitals). Microbiology laboratory for culture and sensitivity and laboratory personnel were available in all study sites.

Participants and selection

This study involved employed MDs with at least bachelor degree in medicine and one year of working experience as a prescriber. Participant was required to be an employee who works at tertiary hospital. Additionally, this study excluded intern doctors and medical students who were under supervision. Participants for the key informant interviews were purposively selected based on the reason that his/her hospital should have a good microbiology laboratory.

Data collection

Semi-structured, individual interviews lasting 15 min each, were conducted in the hospital surroundings after office hours by two members of the study team (FFM and GMB). The question aimed at exploring the reasons, which prompt the prescription of antibiotics with microbiological investigations i.e. culture and sensitivity, especially in resources available settings (hospitals). The guiding question(s) were developed after comprehensive literature review of the studies that were conducted to access this practice in LMICs [4,8,9,11,15]. Specifically, the questions included: work experience and position; hospital category (private/ public hospital), patient category (in/out-patients); and number the number of patients he/she attends per day. The main question was: "Can you prescribe antibiotics to a patient without culture and sensitivity results?" (Additional file 1)

Data analysis

All interviews were tape recorded and fully transcribed. The process of analysis involved familiarization with the data, development of initial codes based on the research questions and issues emerging from the data, refinement of codes, and their allocation to broad themes. Furthermore, all analysis of interviews was done by hand coding, and emerging themes were identified based on frequency of appearance. In addition, analysis was done by two members of the study team who did not conduct the actual interviews (DM and KDM) [21]. In the event of discrepancies, discussion between the researchers and verification with interviewers took place until consensus was reached.

Ethical consideration

Ethical approval to conduct this study was sought from Muhimbili University of Health and Allied Sciences Research and Publications Committee with Ref. No. DA.282/298/01.C/. A written informed consent form was read and signed by all participants.

Results

A total of 31 respondents representing practicing MDs were interviewed where 20 were general MDs, 8 medical specialists and 3 medical consultants. Their work experience ranged from 2 to 35 years.

Prescription of antibiotics

To provide a general picture of the professional attitude and practice related to prescription of antibiotics without microbiological investigation, participants were questioned whether they are ready to prescribe antibiotics without microbiological investigation. Majority of participants (26/31) were ready to prescribe antibiotics without microbiological investigations. In addition, a total of four major themes were identified as summarized below.

- Clinical condition of the patient influence the decision of the attending clinician
- Past experience with the clinical condition and/or patient prompt the practice of prescribing antibiotics without microbiological investigations
- An intention to prevent the spread of infection also greatly influence the immediate prescription because culture and sensitivity result takes too long (average 3–5 days)
- Patient's history and physical examination are sufficient to establish the management plans especially for the type of infections, which are endemic in that particular area.

Theme 1. Patient clinical condition

Majority of the participants (25/31) indicated that patient's clinical condition influence the prescription of antibiotics without microbiological culture evidences.

"Majority of Tanzanian patients seek for health services when they start presenting with serious symptoms, in simple language the condition may become more severe and even threaten patient life if untreated immediately"

Theme 2: Past experience

Past experience in the sense that, a doctor may have already attended the patients or the presenting symptoms are similar from the previous attended cases of the same nature. In this regard, 24/31 participants mentioned it being one the reasons for prescription without microbiological evidence

"Most of the infections are endemic to our settings, so their management are well known, I therefore, use my experience to prescribe"

"It happens that the same patients is complaining the same disease, where I was previously guided by culture and sensitivity results to initiate the management, at this point I may need no laboratory investigation but use my experience to prescribe another antibiotics"

Theme 3: Intention to prevent the spread of infection

Most of the MDs (18/31) gave antibiotics because they wanted to prevent the spread of infection

"If you let the patient leave the health facility untreated and back to the community awaiting for microbiological investigations, culture and sensitivity in particular, that patient may act as a reservoir and spread the disease to other members of the community/family and in most cases patients do not come back for their results when you ask them to do so"

Theme 4. Patient's history and physical examination

Majority of the participants (25/31) mentioned that history of the patients and physical examination were sufficient for prescription of antibiotics

“History and some physical examinations are adequate for me to initiate empirical treatment”

Discussion

Perspectives from medical practitioners on rational use of antibiotics particularly prescription of antibiotics based on culture and sensitivity evidence are necessary to inform the ongoing antimicrobial resistance stewardship program [18]. Therefore, a qualitative study using MDs was conducted to explore the basis of prescribing antibiotics without culture and sensitivity evidence.

This study found that, factors such as patient's clinical condition, time taken for culture and sensitivity and doctor's experience on the disease condition influence prescription and dispensing of antibiotics without microbiological investigations in Dar es Salaam hospital with laboratory capacity to perform culture and sensitivity. These findings were similar from the studies conducted elsewhere [12–16].

Evidence from the study conducted to assess medical seeking behaviors found that that, medical seeking behavior in most cases are influenced by symptoms, patients who are on treatment believe to have the correct diagnosis due to lack of follow-up [19] and recurrence of a disease is mistakenly assumed as the new infection due to lack of prognostic testing. These result concurred with the finding of the current study where Doctors reported that, patient do not come back for their results when they are asked to do so.

The high replication of an infectious disease make difficult for a clinician to wait for culture and sensitivity results [19]. This has been supported by the current findings where the patient's medical condition influenced the prescription without waiting for culture and sensitivity. For the life saving purpose, broad spectrums are mostly prescribed [20].

Lastly, this study found physical examination, which is a result of patient's history, leads to an establishment of diagnosis in most cases accompanied with empirical treatment. But again due to health seeking behaviors outpatients who are given empirical antibiotics rarely return to hospital for their results [19].

The conclusion of these findings was limited to health practitioners working in Dar es Salaam hospitals, which had laboratory capacity to perform culture and sensitivity. In addition, the current study did not assess the practice to differentiate between prescription only medicine and over the counter medicines.

Conclusions

Patient's clinical conditions, practitioners' experience, time taken for culture and sensitivity influenced this practice. The study highlights the need for further emphasis on sensitization seminars about the basis for why guidelines recommend prescribing antibiotics based on laboratory investigation results. In addition, accurate and affordable rapid tests should be advocated to shorten the time required for microbiological investigations. In recognition of the urgent need to improve antibiotic use in hospitals, this study highlights the need to implement hospital Antibiotic Stewardship Programs as recommended by Center for Disease Prevention and Control.

Declarations

Ethics approval and consent to participate

Ethical approval to conduct this study was sought from Muhimbili University of Health and Allied Sciences Research and Publications Committee with Ref. No. DA.282/298/01.C/. A written informed consent form was read and signed by all participants.

Consent for publication

Not applicable

Availability of data and materials

All data used to draw conclusion of the study is provided in the manuscript.

Competing interests

Authors declare that they have no competing interest.

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Authors received no fund to conduct this study.

Authors' contributions

FFM participated in conception, research design, data collection, data analysis and interpretation and drafting of the manuscript, GMB participated in conception, data analysis and interpretation, and revising the manuscripts, FF, EJM and ASK participated in designing the study. MK, RZS, WPM, HJM, IAM, LM and RM participated in manuscript writing. DM and KDM contributed in data interpretation and revising the manuscript. All authors read and approved the final version of this manuscript.

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Authors' information

¹Department of Pharmaceutical Microbiology, School of Pharmacy, Muhimbili University of Health and Allied Sciences, P. O. Box 6513, Dar es Salaam, Tanzania. ²Department of Clinical Pharmacy and Pharmacology, School of Pharmacy, Muhimbili University of Health and Allied Sciences, P. O. Box 6513, Dar es Salaam, Tanzania.

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