

'FEVER MEANS ANTIBIOTIC' THE OMANI PUBLIC'S ATTITUDES TO THE USE OF ANTIBIOTICS FOR TREATING THE COMMON COLD

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ABSTRACT

BACKGROUND: Antimicrobial resistance is a worldwide concern, and the need to reserve the effectiveness of antibiotics in therapy is universally recognised. The irrational use of antibiotics to treat common viral infections is one of the factors contributing to antimicrobial resistance. In depth exploration of the public's attitudes towards the use of antibiotics for treating the common cold will improve understanding of the factors that cause the indiscriminate use of antibiotics, and could have an impact on antimicrobial resistance.

METHOD: Semi-structured interviews were conducted with individuals recruited from public places, within the governorate of Muscat, Oman. The interviews explored public perceptions about self-care of minor ailments. The data were analysed by applying the principles of constructivist grounded theory.

RESULTS: Twenty-one participants were interviewed. Emerging themes included attitude to medicines in general, comprising specifically the use of antibiotics. Some participants indicated that it was necessary to take antibiotics for conditions associated with fever or severe sore throats. They believed that fever and inflammation are always a sign of bacterial infection that requires antibiotics. Participants did not understand the concept of bacterial resistance but thought that overuse of antibiotics affected their immunity to colds and sore throats. Access to antibiotics for treating the common cold is highly influenced by physicians' prescribing behaviours, and there was a clear variance perceived between the private and public primary health sectors with regards to antibiotic prescribing practice.

CONCLUSION: Due to misunderstanding, people believe that antibiotics are needed to treat colds and sore throats. These findings suggest there is a need for educational intervention and better enforcement of clinical guidelines and prescribing policies in Oman.

INTRODUCTION

Antimicrobial resistance (AMR) is a worldwide concern, which has been identified as a complex global public health challenge that requires a multi-domain strategy to combat the problem sufficiently. Within medical practice, the irrational use of antimicrobial medicines is highlighted as having an important impact on AMR¹. With limitations in the development of new generations of antibiotics, restrictive and appropriate use of antibiotics is needed to ensure the availability of effective treatment for microbial infections. Therefore, the World Health Organisation (WHO), on World Health Day 2011, identified the importance of regulating and promoting rational use of antibiotics in medical practice as one of the six main essential strategies to reduce AMR². Factors related to inappropriate or irrational use of antibiotics need to be addressed and improved. Research has been done in many countries to determine factors influencing public and medical professionals' use of antibiotics, with the aim of producing a better and effective response to AMR within the community³⁻⁸. There is however a lack of research in some areas of the world, and therefore a lack of good understanding of the scope of the factors related to this problem in some countries.

Multifaceted educational intervention, involving both the public and healthcare professionals (HCPs) about the use of antibiotics and AMR can combat the threat of AMR, by changing their attitudes towards the responsible use of antibiotics⁹⁻¹¹. Accordingly, many studies have been conducted worldwide to improve understanding of the knowledge, views and attitudes of both consumers and HCPs, to provide better interventions to address AMR⁵⁻⁷. This will help to reduce unnecessary patient demand for antibiotics and/or the improper prescribing or dispensing of antibiotics for conditions such as the common cold.

Self-medication with antibiotics was identified as one of the factors that could contribute to AMR^{2,12}. Studies which looked at self-medication with antibiotics identified that obtaining antibiotics without prescription, or use of leftover prescribed antibiotics are significant issues^{8,13,14}. Where regulation is in place, physicians' attitudes and knowledge drive the prescribing practice and may contribute to the unnecessary use of antibiotics^{4,7}. In Europe, AMR was identified as a public health threat and therefore regulatory health initiatives were introduced to combat this threat globally¹⁵⁻¹⁷.

In the Middle East, and specifically in the Arab gulf countries, there have been numerous quantitative studies that have explored the views and knowledge of the public about the use of antibiotics. Examples of such studies include work in Saudi Arabia¹⁸⁻²⁰, Kuwait²¹, Oman²², and Qatar²³. Although Jose *et. al.* investigated the Omani public's knowledge and attitudes towards the use of antibiotics, the study did not explore the public's understanding of AMR, or the socio-cultural factors contributing to use of antibiotics in common cold.

The aim of this paper is to explore the Omani public's knowledge and attitudes to the use of antibiotics for the common cold and to understand cultural factors that could contribute to AMR. It is part of a larger study aimed to identify factors that influence self-care of minor ailments in Oman.

METHOD

Ethical approval

Ethical approval for the study was obtained from the University of Nottingham, School of Medicine, research ethics committee (OVSA11092014 SoP SRMH Oman). Local approval was sought from the Ministry of Health (MoH) of Oman who confirmed that MoH approval was not required.

Sampling and Recruitment

Three public places (shopping malls) were identified to recruit the study participants. Permission to advertise and recruit to the study was obtained from the administration department of each centre before commencement. A convenience and purposive sampling strategy was used to recruit a range of study participants across age and gender groups. Snowball sampling was used to recruit underrepresented groups (participants over 50 and non-working mothers) that the researcher was not able to recruit via the public places.

The researcher (MA) introduced herself to participants as a researcher from a university, the aim of the study was explained to them by the researcher who then invited them to participate. Individuals were provided with a pack containing participant's information sheet, consent form and the contact details of the researcher. The individual's contact and demographic details were obtained to arrange for the interview at a mutually convenient time and location.

Data generation and analysis

Individual semi-structured interviews were conducted to explore the views and the attitudes of the public toward self-care and management of minor ailments, including the common cold. The interview topic guide was flexible with probing questions asked to consolidate and explore the respondents' beliefs and experiences (see appendix A). The interviews were conducted in Arabic or English, according to participant preference, audio recorded and transcribed verbatim. Interviewing ceased once data saturation was achieved and no more new concepts emerged from the last three interviews.

Transcripts in the Arabic-language were translated into English using a meaning based approach^{24,25}. A certified translator was approached to translate the Arabic transcripts (n=6). Because of the shortage of resources, the remaining transcripts were translated by the researcher herself and an Omani PhD student at the University of Nottingham. Backward translation technique of at least 10% of the translated transcripts was used to check the translation validity. This was performed by a third person who was fluent in both languages and later was reviewed with the researcher MA. A good similarity in the meaning compared with the original transcripts was found, and a good compatibility between the three-different-translators was observed. Data were coded using NVivo® and were analyzed by applying the principles of constructivist grounded theory²⁶⁻²⁸. The emerged codes and themes were revised and discussed with CA and MB.

RESULTS

Twenty-one consented participants were interviewed, nine of them were female and the age ranged from 19 to 78 years old. Analysis of the data identified knowledge and attitudes towards medicines as one of the factors influencing the public's decisions toward handling minor ailments. Hence, public knowledge and belief about common cold and their attitudes to medicines influenced their behaviour on the use of antibiotics for the management of common cold.

Knowledge and belief

The public belief for the need of antibiotics to treat common cold and cough was one of the factors identified in the study that influenced the management of minor ailments. Some participants indicated that it was necessary to take antibiotics for conditions associated with fever or sore throats. Eleven out of 14 participants who discussed the use of antibiotics for the common cold believed that they are needed to effectively relieve the symptoms. They believed that fever is a sign of underlying inflammation which is caused by infection and therefore it always requires antibiotics.

'I do not go to the hospital if I have a cold. I go to the hospital if there is inflammation. If it is only cold, I can control it but if it is cold plus fever, this means you have inflammation. I know that from my readings about the symptoms. If you have a fever, you have inflammation, such as that in the throat. Fever means antibiotic.' Participant 06

The study participants illustrated a poor understanding of when they needed antibiotics. There was a common belief that an individual need to take antibiotics if a fever lasted for more than two or three days. Other indications for taking antibiotics were identified by the study participants, such as tonsillitis or a cough that might disturb their sleep. Some believed that antibiotics can speed the recovery of these conditions.

'When I get itchy throat, I have to take antibiotics from the health centre. I ask for it every time, even if they don't prescribe it, they say: that is minor and take the antibiotic only if needed. Actually, I don't ask for it unless I am really suffering from the cough and can't sleep.' Participant 18

With regard to public knowledge about the inappropriate use of antibiotics and antimicrobial resistance, some participants were aware of the risk of unnecessary use of antibiotics for a common cold. However, they identified the irrational use of antibiotics as a sort of self-harm i.e. affecting their own immunity or causing side effects' rather than having an impact on the community i.e. the emergence of AMR. Some participants explained that the use of antibiotics could affect their immunity and that they will be ineffective when really needed if overused when not required.

'When I needed to use "antibiotic" for my condition, he (the doctor) told me to use the natural immunity of your body instead of relying on the antibiotic, because it could reduce your immunity, you get this advice from doctors that know you well. That's what they suggest.' Participant 10

Some participants were aware of the common administration instructions for antibiotics i.e. complete the course, however others lacked the full understanding of the risk of non-adherence.

'The most important thing is to keep taking it, the physician says that if I do not take it regularly, the fever shall not end. He always advises that I should take the antibiotic regularly.' Participant 7

Public attitude and clinical practice

The attitude of the public in managing common colds is influenced by their knowledge and beliefs about the need for antibiotics for full and fast recovery from the symptoms. This attitude was found to be driven by patients' previous treatments obtained for the common cold that influenced their decision when the symptoms recurred.

There was a clear variance perceived between the private and public primary health sectors with regards to antibiotic prescribing practice. People who were demanding antibiotics showed a preference for visiting a private doctor for easy and fast access to antibiotics; even if they had to pay for the cost of the visit and the prescription.

'I went first to the health center and the doctor said: I don't need it. Then, I went to the clinic, and they directly gave me a prescription for antibiotic. You know, clinics always prescribe antibiotics right from the start. Therefore, I think that public health centers are better from this aspect, they give antibiotics gradually. After that I went to the (hospital Name A) and they advised me: you don't need antibiotics.'
Participant 12

Factors that could contribute to peoples' non-adherence to antibiotics were identified when interviewing the study participants. For example, those who expressed a negative attitude toward medicines and were dissatisfied with doctors who overprescribe antibiotics tended to use lower doses or took antibiotics for a shorter duration, to eliminate the feeling of the guilt of not adhering to doctor's treatment advice.

'Usually I try not to go and see a doctor, because what they give you is antibiotics and I am big believer these things could affect your immunity. He (the doctor) sometimes writes the medicine (antibiotic) but I don't have to take it, so I don't dispense it or take it.'

Researcher: *'So, what do you will do? will you continue on taking the home remedy?'*

'No, if antibiotic I might; to be honest I follow the doctor, I follow what the doctor says but if I take I will not take it for longer I see myself I got better and stop even if he tells me to take it for five days.'
Participant 14

Some parents explained that they tend to struggle getting their children to cooperate in taking medicines and therefore tended to stop antibiotic courses earlier than recommended.

'I continue for 5 days if the child is seriously ill. Most of the time, children don't like to take the medicine.'

That's why I prefer to take the easy way and give them the medicine for 3 to 4 days. The elder children understand better, and therefore I complete the course with them. Participant 13

Some participants expressed their dissatisfaction with doctors' irrational prescribing of antibiotics and lack of patient-centred care. A participant indicated that some doctors tended to prescribe, 'when required' antibiotics. This raised the concern of unnecessary prescribing of antibiotics that could facilitate self-medication and sharing of leftover or home-stored antibiotics.

'Private hospitals and clinics prescribe lots of medicines, either you need them or not, especially antibiotics, I do tell them that the condition does not require antibiotics. I know when antibiotics are needed. They tell me: it is ok, you buy it and keep it with you. That's why I don't go to private hospitals or clinics.' Participant 15

DISCUSSION

The findings of this study help to provide some understanding of the systemic and cultural factors that contribute to the inappropriate use of antibiotics in primary care settings in Oman. To our knowledge this is the first qualitative study in Arab Gulf countries that explored the public perception of antibiotic use, and the first study to explore in depth the Omani public's knowledge and attitudes towards the use of antibiotics for treating the common cold.

There appears to be significant misunderstanding of the need for antibiotics for the common cold in Oman. Participants indicated that stronger medicines like antibiotics are required to relieve their symptoms. The Arabic term used to indicate the need for antibiotics is 'inflammation' and not 'bacterial infection'. People's lack of understanding about the cause of inflammation and its pathophysiology, lead them misinterpreting the need for antibiotics for colds and sore throat. A review and meta-analysis of the international literature showed that 51% of the sample mistakenly thought that antibiotics are same as anti-inflammatory agents and about 50% did not know that antimicrobials are not useful for cold or flu⁵. The public's knowledge and use of antibiotics has been studied in some of the Gulf countries including Oman. The overall findings indicated that people unnecessarily use antibiotics for treating common colds and flu, and have a poor knowledge about the usefulness of antibiotics in these conditions^{18,21,22,29}. Awad *et.al.* found that more than half of their sample believed that using antibiotics can speed the recovery from coughs and colds²¹.

Participants, who were aware of the harmful effects of unnecessary use of antibiotics, reported that antibiotics harm their immunity rather than causing bacterial resistance in the community. Some indicated that there is no harm in taking antibiotic once a year, whereas others tend to take a lower dose or shorter duration than that prescribed by their doctors. Lack of knowledge in the general population about the risks of inappropriate use of antibiotics and identifying it as a self-harm rather than a community-harm, should be taken into consideration when addressing antimicrobial resistance in the country. A review of literature that studied antibiotic knowledge and attitudes, indicated that about half of the sample were aware of the concept of antimicrobial resistance, but 27% of them did not know that misuse of antibiotics could increase the risk of bacterial resistance^{5,21}.

The study that assessed the Omani public's knowledge and beliefs about antibiotic use did not look at the public knowledge about antibiotic resistance²². However a similar study in Kuwait showed that about 49% of the sample were not aware that misuse of antibiotics could have an impact on bacterial resistance and 37% of them were uncertain²¹. In addition that study showed that more than half of the participants thought that humans could be resistant to antibiotics. This could be related to the belief that the overuse of antibiotics could have an impact on individuals rather than on the whole community, similar to our finding.

Lack of standard national regulation and monitoring systems on antibiotic prescribing by physicians, has led to a substantial variation in the use of antibiotics for common colds among the public and private healthcare sectors in Oman. Although the government sector seems to have a regulation in place to control unnecessary prescribing of antibiotics for common colds, this is not the case in the private sector. The overprescribing of antibiotics in the private sector made people question the quality of care provided by the government sector rather than understanding the clinical evidence for the management of common colds. The study shows that the use of antibiotics for minor ailments was perceived to be influenced by the doctors prescribing rather than self-medication with antibiotic without medical consultation. It is important, therefore, to enhance the governance, regulation and monitoring of prescribing of antibiotics in the private sector. Jose *et.al.* found that 84% of the Omani participants did not buy antibiotics from pharmacy without a doctor prescription compared to 14% who said they do. Purchase of non-prescribed antibiotics for self-medication was low in Oman compared to other Arab Middle East countries, where it was more than 30%^{18,21,29}.

Oman, as a member of Gulf Cooperation Council Countries, joined the worldwide initiative in combating antimicrobial resistance (AMR)^{30,31}. Consequently the first national antibiotic guidelines and the national AMR strategy were launched in 2016³¹, with the country goal to tackle AMR at all levels. This study has helped to identify some of the important factors related to misuse of antibiotics in the primary healthcare setting, which will help to inform the implementation of the initial relevant interventions. These include multifaceted educational interventions for both the public and health care professionals (this includes the pathophysiology and expected management of common cold and related minor conditions), review and monitoring of physician prescribing behaviours, and enforcing the adherence to antibiotic guidelines in the private sector^{9,10}. Furthermore, the patient and physician relationship and the physician's communication skills need to be explored in the future, to address the factors related to the patient-centred care and responding to patient demand for prescribing antibiotics, that emerged in this study.

The study helped to identify the individuals' beliefs and attitudes toward the use of antibiotics for common cold as a factor influencing self-care of minor ailments. Evidence showed that different factors that can have an influence on the doctors' prescribing behaviour, which could be patient-related or system-related⁷. Further exploration of the practitioners and pharmacists perceptions in Oman toward the use of antibiotics in common cold will give a better understanding of the situation. A systematic review indicated that prevalence of self-medication with antibiotic is high in Middle East countries, including Oman¹⁴. This study showed low tendency of the public towards

self-medication, or obtaining antibiotics from pharmacy without doctor prescription (n=1). This could be because the study findings are based on individual self-reporting of knowledge and previous experience, and can give a biased response, as people may tend to be more comfortable with sharing experiences and attitudes that are likely to be approved by the interviewer. Therefore, it might be useful to investigate further the prevalence of self-medication of antibiotics within the community and the prescribing practice in healthcare sectors e.g. leading to left-over antibiotics.

CONCLUSION

This small study has identified important factors that contribute to the use of antibiotics in treating the common cold. The public's lack of knowledge about the cause of the common cold leads them to be highly dependable on GPs. It suggests that there is a need to review the terminology used in health education in Oman e.g. 'inflammation' rather than 'infection' or 'immunity' rather than 'resistance'. An educational and awareness program is essential for improved understanding of the pathophysiology, and pharmacotherapy of the common cold and other related common upper respiratory infections. Regulation and monitoring enforcement is warranted on the unrestricted access to antibiotics in primary care clinics, namely the private sector, and on physician prescribing behaviours. Further exploration of factors influencing the irrational prescribing of antibiotics in the private sector is important in order to develop evidence-based-intervention that can have positive impact on tackling AMR in the country.

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Appendix A: Interview topic guide

Starting the interview

- Explain the purpose of the interview, the format and length.
- Confirm the understanding of Participant Information Sheet and if any questions need to be answered before starting the interview.
- Take permission for audio-recording.

During the Interview

Understanding of/ attitude to the concept of self-care of minor ailment

What does self-care of minor ailments mean to them? Tell me what do you know about minor conditions?

Prompts

- What does a minor condition mean to you?
- What do you know about self-care?
- What do you understand by a minor condition?
- Was the "self-care" of minor ailments explained to you before? By who? How did you get the information?
- Tell me how you go about self-care (of minor conditions). What do you do?

Responding to minor ailments

What health seeking behavior/pathway do they use to manage their symptoms? What strategies do they use to manage the condition? Tell me how you manage the condition. Understand if the difference in perceiving the symptoms (severity) affects their response.

Prompts

- How you manage if you/your child/ carer got _____?
- What do you do when you/your child/carers got _____?
- Who do you consult?

Treatment of minor ailment

What is the type and source of medicines used by them to manage their condition? How they practice self-medication?

Prompts

- What helps you manage minor conditions?
- What medicines do you use to treat _____?
- How to get access to _____?
- Was it helpful?
- What make you decide to self-medicate?
- Tell me how you go about self-medicate?
- Why do you self-medicate?

Attitudes toward primary HCP

What are their views toward HCPs in managing their minor conditions? Which health care providers do they consult for minor ailments? Tell me a time when you consulted pharmacist/physician?

Prompts

- Do _____ ask you if you tried to treat the condition?
- What do you think about _____ asking you in _____?
- Do you tell the doctor/pharmacist about your self-management?
- How do you feel about _____ enquiring about the medicines/herbal remedies you have taken before consulting him/her?
- What do you feel/think about the _____ advice on your/your carer symptoms/condition?
- Why do you consult the _____?

Closure of interview

- Thank the interviewee for their time and information shared.
- Ask them "Is there anything more that you think it is important to tell me related to the topic?"
- Make sure they know how to get in touch later if he/she wanted to.