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Editorial

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### Can over-the-counter antibiotics coerce people for self-medication with antibiotics?

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#### ABSTRACT

The current communication, based upon the previous published papers in various scientific web-based journals, states the scenario of over-the-counter sales of antibiotics, including many other factors, that enhance people practice antibiotic self-medication world-wide, which in the developed countries the situation is little different having some resolution with the antibiotic self-medication problems. This paper also states about the prudent use of antibiotics through medical supervision and prescription in order to combat the unwanted antibiotic side effects including emergence of antibiotic resistant bacteria from antibiotic misuse.

### Introduction

The antibiotic self-medication (ASM) refers to the use of antibiotics to treat self-diagnosed health disorders or disease symptoms without doctor's prescription and medical supervision. The antibiotics are well recognized prescription-only drugs, which still are often requested by the people, and dispensed over-the-counter (OTC) from pharmacies without prescription, in order to treat or prevent illness or infections, in both developed and developing nations[1-4]. Self-medication with antibiotics and other drugs can help prevent and treat diseases cost-effectively, but long term use of OTC antibiotics may be deleterious and can potentially outweigh their benefits inviting serious health hazards. As regards the situation antibiotics are self-medicated, mostly for viral requiring no

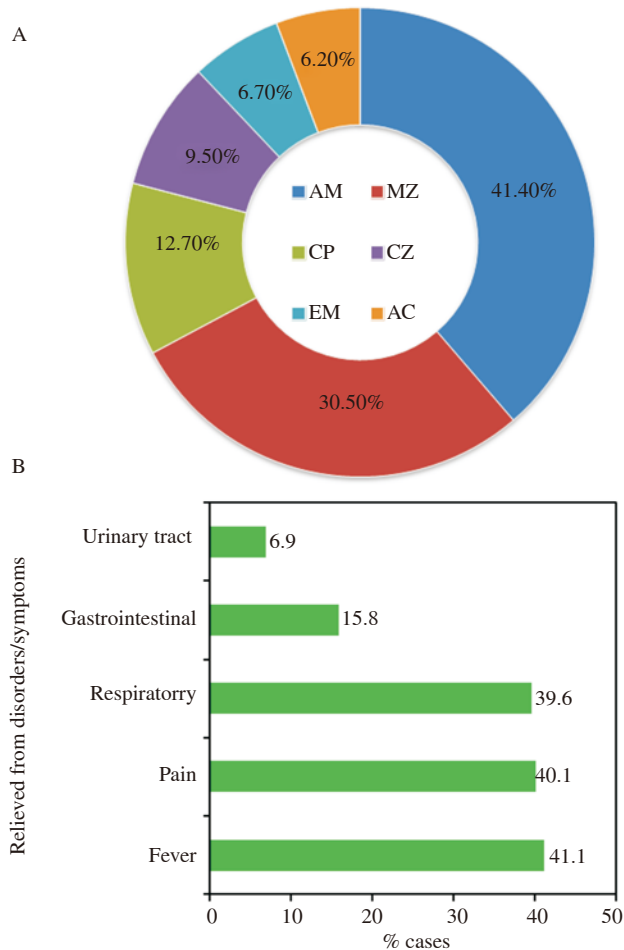
antibiotic therapy, leading to the misuse of antibiotics, which evidently is a reason for the development of bacterial resistance to multiple antibiotics, since there is a direct relation between the indiscriminate use of antibiotics and emergence of increased multidrug resistance[5,6], imposing high treatment costs with limited benefits.

In developing countries, various factors like patients' incapacity to afford the cost of medical consultation (doctor's visit), their dissatisfaction with medical practitioners and OTC antibiotics coerce people practice ASM, based on their past experience or advice/suggestion from peers and the pharmacists, and thus without physician's prescription[7], bearing the increased risk of adverse effects, emergence and dissemination of bacterial resistance and increased healthcare costs. As it has been reported by Emeka, *et al.*[4], the respondents from Saudi Arabia were informed about the OTC antibiotics by the physicians (44.1%), from the pharmacists (13%) and through their previous experiences (15.1%). In India, there is increased incidence of infectious diseases and

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antibiotics are available without prescription[3], and higher usage of antibiotics (due to affordable costs) for self-medication is common, even in the medical fraternity[8]; the vital sources of ASM include the use of left-over antibiotics from incomplete compliance of previous prescription, their acquisition from pharmacies without prescription, and antibiotic sample gift from medical representatives to the medical practitioners, and to their friends. However, countries with strict regulation in OTC antibiotic sales have greatly reduced rate (4%) of prevalence of ASM[9].



**Figure 1.** ASM. A: the common antibiotics used by the non-medical university students of Karachi, Pakistan.

AM: amoxicillin; CP: ciprofloxacin; EM: erythromycin; MZ: metronidazole; CZ: cotrimoxazole; AC: ampicillin-cloxacillin.

B: To get relief from various health disorders and disease symptoms (text data converted from Shah, et al.[12]).

The developed as well as developing countries face with the OTC and ASM problems, such as in the United States, persons purchase antibiotics from countries of the neighbors[10], whereas, others like antibiotic be available without doctor’s prescription considering the effectiveness of the agents (antibiotics) against viral infections[11]. As it has been reported by Shah *et al.*[12], the most common antibiotics used for self-medication for relief from various health disorders and

disease symptoms are depicted in Figure 1, and the adverse effects as per the report, which the respondents experienced after antibiotic usage were abdominal complaints, allergic reaction, sleep disturbance and weakness. The top dispensed antibiotic for self-medication was metronidazole, followed by azithromycin, ciprofloxacin, amoxicillin, tetracycline, flucloxacillin and cefuroxime[13]. The illness such as cold, sore throat and acne were the most common causes of request for antibiotics: amoxicillin and augmentin, without prescription[4]. The common antibiotics dispensed without prescription for sore throat and acute diarrhea from Pune, India were azithromycin and norfloxacin, respectively[14], while those included amoxicillin and fluoroquinolones dispensed by the pharmacists from South India[3]. The antibiotics most recurrently dispensed without prescription by different pharmacies to cure the urinary tract infection were norfloxacin, fosfomycin trometamol, and piperidic acid, while the pharmacies that sold antibiotics for the treatment of sore throat, the commonest one was amoxicillin, followed by amoxicillin-clavulanic acid and azithromycin[1]. The study conducted by Biswas, *et al.*[13] demonstrated excellent recovery in 41.50%, satisfactory recovery in 39.19% and good recovery in 2.02% of the patients using OTC antibiotics for various illness (Table 1). The rampant use of antibiotics that leads to the development bacterial antibiotic resistance, including multidrug-resistance, sometimes causes outbreaks of life-threatening bacterial infection[15].

**Table 1**

Common antibiotics purchased for self-medication in Bangladesh (source: text data converted from Biswas, *et al.*[13]).

Antibiotic	Clinical condition for self-medication
Metronidazole	Diarrhea and dysentery, food poisoning and gastro-intestinal disorders, dental carries and toothache
Azithromycin	Fever, cold, cough, tonsillitis, respiratory tract infections, irritable bowel syndrome
Ciprofloxacin	Fever, cold, cough, diarrhea and dysentery, urinary tract infection, respiratory tract infection, food poisoning and gastro-intestinal disorders, irritable bowel syndrome
Amoxicillin	Fever, cough, cold, dental carries and infection, asthma, sinusitis
Tetracycline	Cough, fever, dysentery, diarrhea

The OTC sale of antibiotics compels the public into ASM practice and direct for mistreatment with improper drugs and dosage selection. The physician should be more professional to justify and prescribe antibiotic(s) for the patients, particularly in rural of the developing countries, where there is lack of way into antibiotic susceptibility testing, and hence the non-availability of local antibiogram information, keeping in mind the selection and dosage of the antibiotics and their plausible side effects including bacterial antibiotic resistance[9], and on the other hand the pharmacists should be aware and careful

to dispense antibiotics because of the potential inspections by the drug regulator to check whether pharmacies are selling antibiotics OTC without prescription[2]. Since the medical representatives may act as the potential source of antibiotics for self-medication by providing free sample antibiotics, their action of such kind should strongly be monitored too, in order to restrict the misuse of antibiotics. Finally, a national (and also the local) antibiotic policy is urgently required to implement in order “to regulate India’s 24 000 hospitals and hundreds of thousands of physicians, as well as its pharmacies”[2], for prudent use of antibiotics. Interestingly enough in Brazil the tendency of amplified practice of self-medication with antibiotics has been tempered, while in Mexico the trend of reduced usage of antibiotics has been improved on restricting OTC antibiotic usage[16]. Above all, we have to live, in this post-antibiotic era, with the bacterial antibiotic resistance that requires global solution, and might be through the continued investigation of biomedicine[17,18].

### Conflict of interest statement

I declare that I have no conflict of interest.

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