Antibiotic Dispensing Practice by Medicine Sellers in Dhaka City-A Cross-Sectional Study

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Abstract

Dispensing antibiotics without prescription is a potential source of inappropriate use. Improvement of antibiotic use is very important in developing countries like Bangladesh. This cross-sectional observational study was conducted in Dhaka city, Bangladesh among 100 purposively selected medicine shops to observe antibiotic dispensing practices of medicine sellers on request for the treatment of nonspecific Upper Respiratory Tract Infection (URTI). Actual practice was assessed with simulated client visit (SCV) with 2 encounters in each medicine shops (a total of 200 encounters). Later self-stated practice was assessed through in-depth interviews with medicine sellers using a digital voice recorder. A total of 42 medicine sellers (42%) interviewed that they would have recommended antibiotics in response to a presentation of nonspecific URTI. In actual practice, antibiotics were dispensed in 108(54%) simulated visits. Total 5 drugs (tab ciprofloxacin, tab azithromycin, cap amoxicillin, cap cephradine, tab levofloxacin) was suggested by medicine sellers. Tab ciprofloxacin is the most preferable dispensed drug by medicine sellers in both actual and stated practices which were 73.15% (79/108 SCV) and 40.48 %(17/42 medicine sellers) respectively. The most frequent question was "duration of disease" which was asked by medicine sellers in 76 %(152/200) SCV. None of the medicine sellers asked about allergic history. Antibiotics were dispensed by medicine sellers in Dhaka city without prescriptions and appropriate indications.

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Introduction

In many developing countries including Bangladesh, the use of antimicrobial drugs for treating people is unregulated. Antibiotics can be purchased without a prescription in medicine shops.1 Moreover Untrained medicine sellers dispense antibiotics, offer alternative antibiotics when the prescribed drugs are out of stock, or refill prescriptions without consulting the prescriber.2,3 Unqualified medicine sellers and unregulated dispensing of antibiotics can lead to a higher incidence of inappropriate use and greater levels of drug resistance.4 Mortality and morbidity from infectious diseases due to antibiotic resistance are increasing day by day all over the world.5 So assessing and improving the dispensing practices of medicine sellers is of great importance for the health of the population. A very few studies have been carried out on dispensing practices by the medicine sellers in our country. Consequently, there is a substantial gap in knowledge around the dispensing behaviors of medicine sellers for antibiotics. Considering the above facts, the present study was designed to observe the dispensing practices of antibiotics by the medicine sellers when the customer approached for treatment of nonspecific upper respiratory tract infection without prescription in Dhaka city.

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Materials and Methods

This cross-sectional observational study was conducted in Dhaka city from Nov 2010 to Feb 2011 on purposively selected 100 medicine shops. Each 25 medicine shops were selected from four traffic division (east, west, north, and south) of Dhaka city.[6] Small-sized medicine shops (50 square feet approximately), one to two medicine sellers per medicine shop were included in the study. Medicine shops within half km of the tertiary hospital were excluded from the study. A preselected scenario by simulated customer visit (SCV)[7] was developed to observe the dispensing practices of medicine sellers to see if they suggested antibiotics or not for a patient of non-specific upper respiratory tract infection. Two volunteers were trained by a professional actor to perform and say the words described in Table-I in a natural and reproducible manner. They bought all recommended drugs and filled in a pre-designed information sheet on the scenario within 15 minutes after the encounter and out of sight of the medicine shop. Two volunteers visited each of 100 medicine shops making a total of 200 SCVs. Only one visit would occur per medicine shop per day. Medicines dispensed in two SCV per medicine shop is termed as 'dispensed consistently'. 'Dispensed occasionally' is termed when medicine sellers dispensed medicines in one SCV per medicine shop. Researchers planned the timing of visits and monitored the progress. After all the simulated customer visits had been completed, face to face in-depth interviews[8,9] were performed by the principal author using a digital voice recorder which included sociodemographic features of medicine sellers and antibiotic dispensing practices in response to treatment of nonspecific URTI. Verbal informed consent was given by all medicine sellers before the interview. A pilot study was done before starting the main study. The study was approved by the ethical committee of Bangabandhu Sheikh Mujib University (BSMMU).

The results Medical were entered into a computer using Microsoft Excel 2010. Differences between the percentage of actual and stated practices of dispensing different types of antibiotics in response to a presentation of nonspecific URTI were compared. Z-test was done to measure the significance of the difference between them.

Table I:

Predetermined scenario: 'My brother is suffering from fever, cough and running nose. He took tab napa and tab histacin, but he is not improving. What medicine can be given for rapid cure?'
The simulated customer was 20-25 years of age with casual dressing. He speaks in the local dialect.
If asked by medicine sellers, the following information was to be replied by simulated customers accordingly
His younger brother is suffering from fever, running nose, cough for two days. His brother's age is around 20 years. The temperature rises up to 100 degrees Fahrenheit and comes back to normal after taking medicines, but again it rises. He has a mild headache. But he has no other problem.

Results

TABLE-II showed the stated and actual dispensing practices of antibiotics in response to a presentation of nonspecific URTI taken by SCV and In-depth interview method respectively in Dhaka city. Forty-two (42%) medicine sellers stated that they would have suggested antibiotics for the treatment of nonspecific URTI. Among them 36(85.71%) medicine sellers dispensed antibiotics consistently and 6(14.29%) medicine sellers sell occasionally in actual practice (Fig-1). Fifty-eight (58%) medicine sellers stated that they would never sell antibiotics in a presentation of nonspecific URTI (TABLE-II). Fig-2 revealed 40(68.97%) medicine sellers were consistent with their statements by not dispensing antibiotics consistently which were observed previously

by SCV. Of the remaining 18 medicine sellers, 12(20.69%) of them dispensed antibiotics consistently in actual practice previously and 6(10.34%) of them dispensed antibiotics occasionally.

TABLE-II: Comparison of actual and stated antibiotic dispensing practices by medicine sellers

Variable	Actual practices observed by SCV* (%)	Stated practices observed by in depth interviews (%)
Suggested antibiotic	108(54)	42(42)
Does not suggested antibiotic	92(46)	58(58)
Total	200(100)	100(100)

* SCV = Simulated Customer Visit

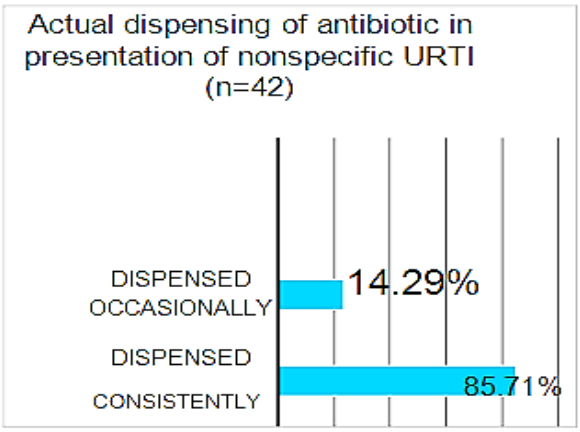

Fig 1: Actual practice by the medicine sellers who stated that they would suggest antibiotics (n=42). 'Dispensed consistently' means dispensed in 2 SCV/medicine shop. 'Dispensed occasionally' means dispensed in 1 SCV/medicine shop.

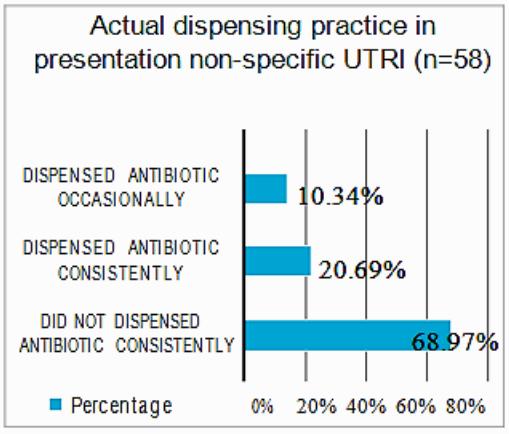

Fig 2: Actual practice by the medicine sellers who replied that they would not suggest antibiotics (n=58). 'Dispensed consistently' means dispensed in 2 SCV/medicine shop. 'Dispensed occasionally' means dispensed in 1 SCV /medicine shop.

TABLE-III showed antibiotics suggested by medicine sellers in response to a presentation of Nonspecific URTI in actual and stated practices. The percentage of actual dispensing practice (73.15%) of tab ciprofloxacin is higher than the percentage of stated practice (40.48%) which is statistically significant. But in the case of tab azithromycin, cap amoxicillin, cap cephradine, percentages of stated practices are higher than percentages of actual practices which are statistically significant. Tab levofloxacin was suggested by medicine sellers least in both actual (2.78%) and stated (4.76%) practice and the difference between the practices is statistically insignificant.

TABLE-III: Antibiotics recommended by medicine sellers in response to a presentation of nonspecific URTI in actual and stated practices

Name of antibiotics recommended	Actual practice* (%)	Stated practice** (%)	p-value
Tab Ciprofloxacin	79(73.15)	17(40.48)	0.00005
Tab Azithromycin	22(20.37)	12(28.57)	0.0168
Cap Amoxycillin	2(1.85)	7(16.67)	0.003
Cap Cephradine	2(1.85)	4(9.52)	0.0263
Tab Levofloxacin	3(2.78)	2(4.76)	0.1473
Total	108(100)	42(100)	

*Actual dispensing practices observed by SCV (2 visits/shop)

**Stated dispensing practices obtained by face to face in-depth interview (1 interview/shop)

TABLE-IV showed the different duration and doses of antibiotics suggested by medicine sellers in actual practice. Tab ciprofloxacin (500 mg) twice daily for 5 days was the most popular duration recommended by medicine sellers. Tab ciprofloxacin (250 mg) was also suggested by medicine sellers for 7 days and 5 days in 1.26% and 3.80 % simulated visits respectively. Tab azithromycin was suggested once daily for 3 days, 7 days, 5 days in 8.33%, 6.48%, and 4.63% simulated visit respectively. Medicine sellers suggested tab levofloxacin (500 mg) once daily for 7 days (2.78% SCV), cap amoxicillin (250 mg) for 5 days (1.85% SCV), cap cephradine (500mg) for 5 days (1.85% SCV). One medicine seller suggested tab azithromycin (500 mg) for 1 day then 250 mg for the next 4 days.

TABLE-IV: Duration and doses of antibiotics dispensed by medicine sellers to simulated customers (n=108)

Name of Antibiotics	No of SCV*	Percentage
Tab Ciprofloxacin		
500 mg twice daily for 7 days	25	23.15
500 mg twice daily for 5 days	38	35.18
500 mg twice daily for 3 days	12	11.11
250 mg twice daily for 7 days	1	0.92
250 mg twice daily for 5 days	3	2.78
Tab Azithromycin		
500 mg twice daily for 7 days	7	6.48
500 mg once daily for 5 days	5	4.63
500 mg once daily for 3 days	9	8.33
500 mg 1 st day 500mg, then 250 mg daily for 5 days	1	0.92
Tab Levofloxacin		
500mg once daily for 7 days	3	2.78
Cap Amoxycillin		
250 mg thrice daily for 5 days	2	1.85
Cap Cephradine		
500mg thrice daily for 5 days	2	1.85

* SCV = Simulated Customer Visit

Fig-3 showed medicines other than antibiotics were dispensed by medicine sellers in 30(15%) SCVs. In 14 (46.67%) SCV, other medicines were dispensed with antibiotics to simulated customers. The most dispensed drug was tab paracetamol + caffeine which were dispensed in 12(40%) SCV. Then tab cetirizine was dispensed in 6(20%) SCVs. Tab desloratadine and paracetamol suppository both were dispensed in 3(10%) SCVs. Both herbal cough syrup and dextromethorphan HCl syrup were dispensed in 2(6.67%) SCVs. Both tab fexofenadine and tab salbutamol was dispensed in 1(3.33%) SCV.

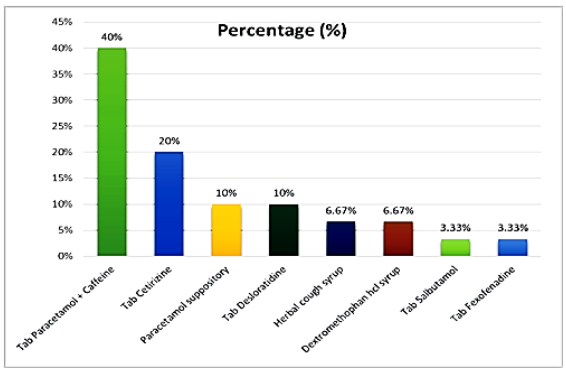

Fig 3: Simulated Customer Visits (SCV) Where other medicines were dispensed by medicine sellers (n=30).

Medicine sellers asked about some information from the stimulated customers during the presentation of nonspecific URTI. Most of the information was asked at the start of the conversation. The most important question for them was the duration of the disease, which was asked by medicine sellers in 76% (152/200) SCV. The second important information for them was the intensity of the fever which was asked in 42 %(84/200) SCV. The patient's age and type of fever were asked in 7.5 %(15/200) and 6.5 %(13/200) SCV respectively. Seldom asked questions were about headache, cough, and body ache (1.5%, 1.5%, 5% SCV) (Table V).

TABLE-V: Simulated Customers Visits (SCV) where information was enquired by medicine sellers (n=200)

Subject of question	No. of SCV	Percentage
Duration of disease	152	76
Intensity of fever	84	42
Patient's age	15	7.5
Type of fever (continuous/intermittent)	13	6.5
Cough (productive/unproductive)	3	1.5
Headache	3	1.5
Body ache	1	0.5

*multiple responses

TABLE-VI showed that medicine sellers advised simulated customers during the treatment of nonspecific URTI. The most common advice was to continue previous treatment which was given in 35.5 %(71/200) simulated visits. Medicine sellers advised simulated customers to come with patient in 2 simulated visits. The advice was given in 80% of all the encounters.

TABLE-VI: Simulated Customers Visits (SCV) where advice was given by medicine sellers (n=200)

Advice	No. of SCV	percentage
Continue previous treatment	71	35.5
Consult with the doctor for treatment	38	19
Wait for 1-2 days, if disease persist consult with the doctor	10	5
Wait for 3-4 days, if disease persist consult with the doctor	10	5
Wait for 5 days, if the disease persists consult with the doctor	4	2
Wait for 1-2 day, if the disease persists take the antibiotic	10	5
Wait for 3-4 day, if the disease persists take the antibiotic	3	1.5
Have plenty of water	3	1.5
Come to medicine seller if condition not improved	5	2.5
Do not give tab histacin to patient	4	2
Want to give medicine after seeing the patient	2	1
No advice given	40	20

In-depth interviews revealed almost all medicine sellers were male (99%). Most of them (48%) were between 31-40 years of age. A total of 24 medicine sellers had completed a pharmacy certificate course of 3 months(category C) and 3 medicine sellers had completed a 3-year diploma course in pharmacy (category B)(Table VII).

TABLE-VII: Demographic characteristics of medicine sellers (n=100)

Characteristics	Frequency	Percentage
Gender		
Male	99	99
Female	1	1
Age(years)		
<20	2	2
20-30	35	35
31-40	48	48
41-50	10	10
>50	5	5
Educational status*		
Category C pharmacist		
Category B pharmacist	24	24
Others (Paramedics course,	3	3
LMAF course, etc.)	32	32
No health-related certificates	43	43
Do not want to answer	1	1

*Multiple responses {3 medicine sellers had completed both pharmacy certificate and LMAF (Local Medical Assistant and Family Planning Training) course}

Discussion

This cross-sectional observational study used a simulated customer visit method for data collection to assess the actual practices of medicine sellers in Dhaka city. In medicine shops usually, no records are kept. To assess actual practices, a researcher may have to wait for a long time for a particular condition. In this situation, this method would give the most reliable result. Hence the purpose of the study was not to deceive medicine sellers but to study their dispensing behavior under realistic settings.[7]

The present study used a simulated illness, nonspecific URTI for which there is no evidence that antibiotics offer clear advantages.[10,11] However, this study showed that antibiotics were dispensed in the presentation of nonspecific URTI in 54% of simulated visits. A similar study in Bangalore, India observed, 82 (71.3 %) of the 115 pharmacies dispensed antimicrobials without a prescription in URTI simulation which was more in number.[12]

Later 42 medicine sellers stated they would have recommended antibiotics for the same reason. Several studies have shown that stated practice tends to be better than actual practice.[13-15]

In this study, simulated customers played the role of relatives of the patient which was similar to earlier studies.[16-18] Only one medicine seller advised simulated customers to come with the patient in both visits in his shop.

Antibiotics recommended to customers in simulated visits were tab ciprofloxacin (73.15%), tab azithromycin (20.37%), tab levofloxacin (2.78%), cap amoxicillin (1.85%), and cap cephradine (1.85%). A similar study in India showed the most common antimicrobial drug dispensed was amoxicillin (51.2%), followed by azithromycin and ciprofloxacin (12.2 % each).[12] A Greek study in 2001 also revealed most of the pharmacists suggested amoxicillin in the treatment of acute rhinosinusitis.[17] Another study in Saudi Arabia observed that amoxicillin/ clavulanate was the most commonly dispensed antibiotic in cases of sore throat.[18]

Later among 42 medicine sellers, 17(40.48%) of them stated that they would like to recommend tab ciprofloxacin in this type of problem. Other suggested antibiotics are tab azithromycin (28.57%), tab levofloxacin (4.76%), cap amoxicillin (16.67%), and cap cephradine (9.52%). There is a sizable difference between actual and stated practices of tab ciprofloxacin. However, in both practices, it is the most preferable dispensed drug among medicine sellers. There is a popular conception that ciprofloxacin can cover almost any disease. Furthermore, the recommendation of drugs can be frequently driven by financial profit and not by rational therapeutic choice and undeniably antibiotics are more profitable than other medicines.[19]

In the present study, all medicine sellers instructed orally about dose, duration, and frequency of antibiotic consumption during selling antibiotics to simulated customers. A often to take the antibiotic and 9(37.5%) pharmacists explained how long the antibiotic should be taken.[20] Another study in India showed more numbers of medicine sellers (69.5%) had given instructions on duration and frequency of antibiotic consumption.[21]

In the present study, other medicines were also sold by medicine sellers in 30 simulated visits. A similar study in India observed a small proportion of medicine sellers (30%) had given non-pharmacological advice (steam inhalation) to simulated customers to reduce symptoms of similar disease.[21]

The present study showed medicine sellers never asked questions regarding the history of drug allergy. The result is comparable to the studies observed in Bangalore, India, and Riyadh, Saudi Arabia.[12,18] Another Indian study by Jaganathan M *et al* observed that history of drug allergy was enquired by 7 (15.2%) medicine sellers only.[21] Llor and Cots in their study showed query was slightly higher (33.3%) in similar illness.[20]

The present study showed only 27 medicine sellers were registered pharmacists. According to the Drugs (Control) Ordinance 1982, section (viii), no person being a retailer, is allowed to sell anydrug without the personal supervision of a pharmacist registered in any Register of the Pharmacy Council of Bangladesh.[22] In our country, most of the time the drugs are dispensed without the direct supervision of any registered pharmacist.

Conclusion

Dispensing pattern of antibiotics by medicine sellers in Dhaka city is inappropriate. Inappropriate antibiotic dispensing was confirmed in this study by dispensing antibiotics in response to a presentation of nonspecific URTI where antibiotic was not required. Implementation of educational intervention, legislation can improve the dispensing practices of medicine sellers.

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