Self-medication practices with antibiotics among 2nd year medical students of North Bengal Medical College

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Abstract:

Introduction: Medical students have easy access to information from various sources to self-diagnose and self-medicate.

Objectives: The present study attempts to assess the practices of self medication with antibiotics (SMA) and knowledge regarding antibiotics in medical students.

Materials and methods: This descriptive study with cross sectional design was conducted in August 2017 among 150 2nd year MBBS students of North Bengal Medical College using a self administered predesigned pretested questionnaire.

Results: Ninety-one (83.5%) of the students could remember using antibiotics in the previous one year. Of them, 67 (73.6%) had self medicated with antibiotics. Almost two-thirds of them (86.7%) had used antibiotics between 1-3 times during the previous year. Fever (74.6%) was the commonest reason for SMA and fluoroquinolones (49.3%) were the most commonly used antibiotics. The main reason for self medication by antibiotics by students was convenience (82.1%). Antibiotic selection was mostly based on a previous doctor’s prescription (61.2%). Prohibitory cost of antibiotics was a common reason for deciding the reasons for selection of a particular antibiotic (20.9%). Antibiotics were most often bought from the shopkeeper at the local pharmacy (85.1%). Majority of the students had the habit of sometimes changing the dosage of antibiotics (47.8%) or switch antibiotics (52.2%) during the course of treatment. Almost 60% of students reported taking more than one antibiotics. Only 17.9% completed the full course of antibiotics. (Table 2)

Conclusion: The present study finds a high SMA prevalence among students at North Bengal Medical College.

Keywords: Self-medication, medical, students, antibiotics.

Introduction

Self-medication has previously been defined to be “the taking of drugs, herbs or some remedies on one’s own initiative, or on the advice of another person without consulting a doctor.” Self-medication with antibiotics (SMA) is becoming increasingly common due to multiple factors like exposure to greater amount of information, increased access to antibiotics, and over the counter availability of such drugs in India. Other factors like physician fees, illiteracy and lack of time have also been seen to be associated with the practice. People using these antibiotics generally do not have information regarding their proper use, doses and possible side-effects exposing them to serious and sometimes life threatening adverse events. Negligent antibiotic use and consistent dismissal of warnings against over-use of antibiotics often result in conditions where the pathogens develop resistance against the antibiotics that are administered in inadequate and improper dosage schedules.

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A study in Italy among medical, dental, nursing and other health care profession students found less than half of the interviewed students (45.6%) claimed to have taken antibiotics on their own in the previous year. Around 20% of the participants stated that antibiotics were appropriate for viral infections and 15% of the students said that they stopped taking the drugs when symptoms decreased.1 In China, 47.9% of study participants from a medical school had a lifetime history of Self-medication with antibiotics (SMA). Among self-treated students, 43.5% believed that antibiotic were suitable for viral infections. Almost 70% had more than one SMA episode in the previous year, 73.5% self-medicated with at least two different antibiotics, 57.1% and 64.4% changed antibiotic dosage and antibiotics during the course, respectively.2 Closer home, a study conducted in Karnataka among 160 government doctors randomly chosen from Hasan district in Karnataka looked specifically into the self-medication with antibiotics (SMA) practices and found a prevalence of 53% among the group.3

Compared to general public many factors influence practice of self-medication among medical students. They have easy access to information from various sources to self-diagnose and self-medicate. As they are the future doctors and health
prescribers of the community, the researchers decided to assess the SMA practices in this group.

**Objectives**
The present study was conducted among 2nd year medical students of North Bengal Medical College with the following objectives
- To assess the prevalence of SMA
- To assess the practices of SMA in this group of students
- To assess the knowledge regarding antibiotics in the participants

**Materials and methods**
*Types and study design:* Descriptive study with cross sectional design  
*Study setting:* North Bengal Medical College and Hospital  
*Study Period:* The study was conducted for a period of one month from 02.08.17 to 24.08.17  
*Study population:* 2nd year MBBS students  
*Exclusion criteria:* Students not found despite two attempts or not willing to participate were excluded from the study. Incomplete questionnaires were not included in the final analysis  
*Sample size:* The expected sample size to be included in the study was 150. However 109 of the students were finally enrolled in the present study  
*Sampling technique:* Data was collected from consecutive students  
*Tools:* A self-administered schedule, composed of three sections, was used to record data for the present study. The first part of the questionnaire included socio-demographic characteristics of the students interviewed, such as age, gender, residence, monthly allowance etc. The second part was addressed to evaluate the prevalence and patterns of SMA in the previous one year. This part was a slightly modified version of a validated questionnaire used in a study of SMA among Chinese medical students. In the third part the knowledge about antibiotic and related adverse reaction was assessed.  
*Technique:* Interview of the study subjects.

*Data Analysis:* Collected data were entered into Microsoft Excel (Microsoft Corp; USA) and cleaned. Final statistical calculations were carried out using IBM SPSS (Version 21).

**Results**
**The study population**
Among the students included in the students most (91.8%) were in the age group of 19-23 years, while only one of them was more than 23 years old. Most of the participants were boys (81.7%) and received a monthly allowance of Rs 2000-5000 from their parents. (Table 1)

**Proportion of students with SMA**
Ninety-one (83.5%) of the students could remember using antibiotics in the previous one year. Of them, 67 (73.6%) had self medicated with antibiotics. Almost two-thirds of them (86.7%) had used antibiotics 1-3 times during the year while the rest had SMA for more than 3 times in the previous one year.

<table>
<thead>
<tr>
<th>Variable</th>
<th>Frequency</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age group (in years)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt;19</td>
<td>8</td>
<td>7.3</td>
</tr>
<tr>
<td>19-23</td>
<td>100</td>
<td>91.8</td>
</tr>
<tr>
<td>&gt;23</td>
<td>1</td>
<td>0.9</td>
</tr>
<tr>
<td>Gender</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>20</td>
<td>18.3</td>
</tr>
<tr>
<td>Male</td>
<td>89</td>
<td>81.7</td>
</tr>
<tr>
<td>Monthly Allowance (INR)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2000-5000</td>
<td>79</td>
<td>72.5</td>
</tr>
<tr>
<td>&gt;5000</td>
<td>23</td>
<td>21.1</td>
</tr>
<tr>
<td>Did not want to disclose</td>
<td>7</td>
<td>6.4</td>
</tr>
</tbody>
</table>

Fever (74.6%) was the commonest reason for SMA followed by cough (44.8%) and diarrhea (40.3%). The most commonly used medications were fluoroquinolones (49.3%), other beta lactams (47.8%) and macrolides (38.8%). The least commonly used antibiotics were cotrimoxazole and aminoglycosides (1.5%). (Figure 1, 2)

**Figure 1: Reasons for self medication with antibiotics**

**Figure 2: Commonly used antibiotics for self medication**

**Practices regarding SMA**
The main reason for self medication by antibiotics by students was convenience (82.1%) followed by cost-saving (37.3%). In most cases (61.2%) the antibiotic selection was based on a previous doctor’s prescription. The other top reasons given by the students were selection based on their own experiences (41.8%), opinion of family members (34.3%) and opinion of friends (32.3%). The main reason for choosing an antibiotic over another was the type of antibiotic (76.1%) in most cases. Although reported by the lowest
number of students, prohibitory cost of antibiotics was responsible deciding the type for deciding the reasons for selection of a particular antibiotic in the study population (20.9%). Antibiotics were most often bought from the shopkeeper at the local pharmacy (85.1%). Only 3% of the participants ordered their medicine online. Checking of instructions from package inserts was always practiced by about a fourth of the participants (25.4%) and occasionally by 62.6%. Twelve percent (12%) of the students never checked the package inserts for instructions. The majority (47.8%) of the users obtained information regarding the dosage by consulting with a doctor. The internet was the source of information in 19.4% of the students. Majority of the students had the habit of sometimes changing the dosage of antibiotics (47.8%) or switch antibiotics (52.2%) during the course of treatment. The most common reason for switching antibiotics was that the medicines did not seem to work (40.3%). Almost 60% of students reported taking 2 antibiotics during a single episode of illness while 6% reported using the same antibiotic with different names at the same time. Most (62.7%) of students with SMA stopped taking antibiotics on disappearance of symptoms while only a fifth (17.9%) of them stopped on completion of the course. Almost two-thirds (70.1%) of the students felt that SMA was a good or acceptable practice. When asked if they felt they could treat common infections with antibiotics successfully by yourself, 14% said no while 70.1% were not sure. (Table 2)

<table>
<thead>
<tr>
<th>Table 2: Table showing self medication behaviour of students</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Questions</strong></td>
</tr>
<tr>
<td><strong>Reasons for SMA with antibiotics</strong></td>
</tr>
<tr>
<td>Cost saving</td>
</tr>
<tr>
<td>Convenience</td>
</tr>
<tr>
<td>Lack of trust in prescribing doctors</td>
</tr>
<tr>
<td>Others</td>
</tr>
<tr>
<td><strong>Your selection of antibiotics was based on...</strong></td>
</tr>
<tr>
<td>Recommendation by community pharmacists</td>
</tr>
<tr>
<td>Opinion of family members</td>
</tr>
<tr>
<td>Opinion of friends</td>
</tr>
<tr>
<td>My own experience</td>
</tr>
<tr>
<td>Recommendation by net citizens</td>
</tr>
<tr>
<td>Previous doctor’s prescription</td>
</tr>
<tr>
<td>Advertisements</td>
</tr>
<tr>
<td><strong>Reasons for selecting a particular antibiotic</strong></td>
</tr>
<tr>
<td>Type of antibiotics</td>
</tr>
<tr>
<td>Brand of antibiotics</td>
</tr>
<tr>
<td>Price of antibiotics</td>
</tr>
<tr>
<td>Indications for use</td>
</tr>
<tr>
<td>Adverse reaction</td>
</tr>
<tr>
<td><strong>Obtain antibiotics from?</strong></td>
</tr>
<tr>
<td>Shopkeeper at pharmacy</td>
</tr>
<tr>
<td>Non qualified practitioners</td>
</tr>
<tr>
<td>Left over from previous prescription</td>
</tr>
<tr>
<td>Online shopping/e-Pharmacy</td>
</tr>
<tr>
<td><strong>Check instructions on package insert?</strong></td>
</tr>
<tr>
<td>Yes, Always</td>
</tr>
<tr>
<td>Yes, Sometimes</td>
</tr>
<tr>
<td>Never</td>
</tr>
<tr>
<td><strong>Understand instructions?</strong></td>
</tr>
<tr>
<td>Fully understood</td>
</tr>
<tr>
<td>Partially understood</td>
</tr>
<tr>
<td>Did not understand at all</td>
</tr>
</tbody>
</table>

**Know the dosage of antibiotics?**
- By checking the package insert | 14 | 20.9 |
- By consulting a doctor | 32 | 47.8 |
- By consulting a family member/friend | 16 | 23.9 |
- From the newspaper, books or TV advertisements | 1 | 1.5 |
- From the internet | 13 | 19.4 |
- From previous experience | 39 | 43.3 |
- By guessing the dosage by myself | 5 | 7.5 |
- By consulting a pharmacist | 22 | 32.8 |

**Change the dosage of antibiotics deliberately during the course of self-treatment?**
- Yes, always | 5 | 7.5 |
- Yes sometimes | 32 | 47.8 |
- Never | 30 | 44.7 |

**Why change?**
- Improving condition | 26 | 51.0 |
- Worsening condition | 7 | 13.7 |
- To reduce adverse reaction | 13 | 25.5 |
- Drug insufficient for complete treatment | 4 | 7.8 |
- Others | 1 | 2.0 |

**Switch antibiotics during the course of self-treatment?**
- Yes, always | 7 | 10.4 |
- Yes, sometimes | 35 | 52.2 |
- Never | 25 | 37.4 |

**Why switch?**
- The former antibiotic did not work | 27 | 40.3 |
- The former antibiotic ran out | 6 | 9.0 |
- The latter one was cheaper | 11 | 16.4 |
- To reduce the adverse reaction | 25 | 37.3 |
- Others | 1 | 1.5 |

**How many different antibiotics did you take maximally during a single illness?**
- 1 | 26 | 38.8 |
- 2 | 35 | 52.2 |
- 3 | 6 | 9.0 |

**Are you concerned that you might have taken counterfeit antibiotics?**
- Yes, very much | 10 | 14.9 |
- Yes, somewhat | 34 | 50.7 |
- No | 23 | 34.4 |

**When did you normally stop taking antibiotics?**
- After a few days regardless of outcome | 8 | 11.9 |
- After symptoms disappear | 42 | 62.7 |
- At the completion of course | 27 | 40.3 |
- After consulting a doctor/pharmacist | 12 | 17.9 |
- Few days after recovery | 24 | 35.8 |
- After antibiotics ran out | 6 | 9.0 |

**What did you do for the adverse reactions?**
- Stopped taking antibiotics | 27 | 40.3 |
- Switched to another antibiotic | 7 | 10.5 |
- Consulted family member/friend | 12 | 17.9 |
- Consulted a doctor | 24 | 35.8 |
- Nothing | 3 | 4.5 |

**What do you think about self-medication with antibiotics for self health care?**
- Good Practice | 15 | 22.4 |
- Acceptable practice | 32 | 47.7 |
- Not acceptable practice | 20 | 29.9 |

**Do you think you can treat common infectious diseases with antibiotics successfully by yourself?**
- Yes, I can | 12 | 17.9 |
- Not sure | 47 | 70.1 |
- No, I cannot | 8 | 14.0 |

*The numbers and percentages may add up to more than 100% due to multiple answers to question.
Discussion
SM is the utilization of medicines by persons on their own without any proficient medical supervision. In developing countries like India, most episodes are treated by SM due to easy availability of non-prescription drugs. It is a prominent constraint in ensuring the safe and effective use of medicines. It is more likely to be inappropriate without complete knowledge although it is becoming a routine practice nowadays especially by undergraduate medical students.5,6

Self-medication is fairly common among undergraduate medical students in India found in 88.18% in Gulbarga6 and 78.6% in Mangalore.8 In West Bengal the same was seen in 57.1% of the students.7 Of the medicines that are commonly self-administered by the medical students antibiotics are the commonest.7 The present study revealed that 83.5% of students reported SM practices in the preceding one year. However, various studies have reported different prevalence figures ranging from 43.2 to 91.9%.10,11 It is very difficult to compare the prevalence of different studies with present study due to different demographic characteristics, different methodology, and different socioeconomic status. The prevalence of SM varied amongst different years of students and found increasing from first year to final year and the reason might be the knowledge of medicines in final year students which is comparable with the findings of previously conducted studies.11,12 Conversely, a study carried out in Maharashtra reported more prevalence in first year students. Also, the SM practice was found more in female students as compared to male students which is in concordance with previous works.11,13

The reasons behind SM are cost saving, convenience, lack of trust in prescribing doctors etc. The commonest illnesses that led to SM in this study (fever, diarrhea, and cough) were also reported similarly in other studies.5,14 A study carried out in a tertiary care medical college of West Bengal reported antibiotics to be the most commonly used drugs. According to the present study Fluoroquinolones, beta lactams and macrolides are most commonly used antibiotics. The study group mentioned the most common source of information for SM as previous prescriptions, reading material followed by followed by their own experience; this is comparable with previously conducted studies.5,11,15 With respect to the source of drug procurement, we observed that the pharmacy was the most common source which is similar to the results of previous studies.11 The reason being easy availability and prior relief from the illness by the drug procured from the pharmacy. Though the students have easy accessibility to the physicians the cumbersome procedure of consultation, prescription procurement and then going to the pharmacy increased the practice of SM.

Most common reasons for SM reported in our study were minor ailments and quick relief. These findings are comparable with the findings in literature.12 However other workers reported previous expertise lack of time to consult doctor, quick relief,11 and time saving as common ailments.16 The observations regarding reading package inserts and labels and following the instructions written on them are in accordance with earlier studies.5,10 Our findings regarding awareness of non-prescription medicines are in agreement with the findings of studies carried out in other parts of India.

Majority of the students of the study reported that they were aware of adverse effects of medicines used by them which, are analogous with the findings of other workers.5

Limitations
Out Of 150 students, only 109 (72.66%) could be included in the present study. Since the methodology was based on recall of antibiotic use over the last one year there remains the possibility of a recollection bias influencing the results to a large extent.

Conclusion
Thus our study demonstrates that SM is highly prevalent in medical students of North Bengal Medical College. The reason might be the awareness of drugs due to easy accessibility of information through media. Since SM is at an alarming pace, education of the youth to ensure safe practices is the need of the hour. Though SM is difficult to eradicate, various measures can be taken to discourage such practices. If action is not taken, the danger of interactions and adverse effects could increase.

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