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Antibiotic use knowledge and behaviour at a Ugandan University

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Abstract

The study evaluated knowledge, attitude and behaviour of antibiotic usage in two student groups at Makerere University in Uganda. Out of 30,000 students enrolled at the university, 1000 were asked to participate by filling a self administered questionnaire. The sampling group was divided into Group A which included students from the College of health sciences and Group B made of students of other faculties.

The response rate was 72.1% and 58.8% were male. The sample size distribution didn't differ from the university gender distribution Z=1.57, p< 0.05. The use of antibiotics to avoid illness was reported by 24.0% in Group A and 31.8% in Group B (P<0.05). When asked the course of action if they felt the antibiotic being used was not helpful, 35.1% in group A and 50.6% in B said they would go back to the same health care worker for advice while 1.4% and 9.9% respectively would switch health care provider. Up to 69.3% of the respondents reported antibiotics use in the last twelve month. The most common symptoms reported as the primary reason for antibiotic use was cough at 16%, followed by sore throat at 7.1% and common cold at 6.1%.

The high reliance on health care personnel for prescription was rather encouraging and it gives health workers a window of opportunity to promote rational antibiotic use when prescribing to patients. However, for this to materialize the health workers must be aware of antibiotic resistance and ways to combat it. Therefore constant training and encouragement must be given to the health care workers and the public.

Key words

Antibiotics; prescription; self medication

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Introduction

Self-medication with antibiotics may lead to a wrong choice of antibiotics. This is partially due to the fact that patient knowledge of appropriate treatments for infections may be inconsistent with available evidence of effective treatment.[1] For instance; there is widespread use of antibiotics for primarily viral self-limiting respiratory infections.[1] Investigators have reported that resistance of common pathogens is positively correlated with exposure to antibiotics.[2-4] One of the factors that contributes to excessive exposure of pathogens to particular antibiotics is use without prescription.[1-3] This sometimes leads to inappropriate use of the drugs ranging from too low a dose for effectiveness, use for very long or short periods, wrong choice of drugs, use in situations where there is absolutely no indication, to instances of wrong combinations.[1,5] Self medication is a worldwide phenomenon occurring in both the developed and developing world. Unfortunately it is particularly more marked in developing countries due to the tremendous health needs that are not backed by equal facilities and access.[6-9] Likewise self medication has been reported among both highly educated and those with minimal formal education. It's well documented among urban as well as rural dwellers.[8-13]

Studies on antibiotic self medication are many and they report several outcomes on indications, knowledge, drugs used against patient described symptoms and extent of the habit. While in some countries high rates of self medication with antibiotics are reported, others such as Sweden the problem is virtually unheard of.[1,6,9 -14] Additionally reports have shown that health care personnel may drive self medication and misuse of antibiotics due to their prescription patterns from which the community picks its cues.[5] In Uganda just like many developing countries, antibiotics are freely available over the counter with or without a prescription. In fact in many instances the personnel manning these drug outlets advise the patients on what to take. We also have drug hawkers within the public commuter taxi parks and bus stations who likewise advise patients on what medication to take including antibiotics.[15] The aim of the present study was to evaluate the current knowledge, attitude, and behaviour regarding antibiotic use among the students of a university in Uganda. We also attempt to determine the extent of self medication with antibiotics in this population group within the previous year.

Materials and methods

The study was planned as a cross-sectional analytical study on undergraduate students of Makerere University including all faculties. The university has 2 diploma and 82 undergraduate courses. It has a student population of 33,112 of whom 56% are male and up to 93.6% are undergraduate. Convenient sampling was used by giving questionnaires to only those who accepted to take part. One thousand self administered single page questionnaires were distributed to students who were requested to fill and return them to the person who had given it to them. The questionnaire was pre-tested for content and design on 10 final year dental students who helped modify it including adding some commonly available antibiotics on top so as ensure that the respondents understood what it was all about. The sampling group was divided into two groups; Group A was made up of students from the College of Health Sciences, while Group B was formed of students from the other faculties. A questionnaire comprising 11 questions, excluding the demographic details, was used.

The questions aimed at determining the level of knowledge were true or false with an option of "I don't know". Questions to determine the attitude and behaviour were prepared as yes/no and multiple choice option. The questions on antibiotics last used and symptoms that required treatment were open ended. In true/false and yes/no questions differences between Groups A and B proportions were tested. In multiple choice questions differences between the answers were tested. Chi-square was used to compare the answers given by the two groups and P values less than 0.05 were considered significant.

Results

Out of 1000 questionnaires distributed, 721 were returned giving a response rate of 72.1%. Of the respondents, 58.8% were male while for 6.6% the gender was not reported. The sample size distribution didn't differ from the university gender distribution ($Z=1.57$, $p< 0.05$). Out of the undergraduate degree programs available at the university 68 programs were represented, but 44 respondents didn't indicate

theirs. Some of the programs that were captured are shown in figure 1. The age and gender distribution of the sample group was as shown in table I. The questionnaire and the answers given to the questions about knowledge, attitude and behaviour by the two groups are summarized in Tables II and III. Those that didn't answer the particular query were not included in that specific analysis.

The use of antibiotics in order not to get ill was 24.0% in Group A and 31.8% in Group B ($P<0.05$). Among group B when it came to the course of action if they felt the antibiotic being used is not helpful, 50.6% said they would go back to health care worker for advise while 9.9% said they would go to a different health care provider, 30.9% would use it for recommended time and 8.6% gave other answers such as 'never had that experience' and 'stop and buy something else'. On the other hand from the Group A respondents 35.1% would go back to the previous health care provider, 1.4% would change health providers, 49.5% would finish the dose while 17.5% would change drugs. The difference was only statistically significant for the response until symptoms disappear ($p=0.001$). Up to 69.3% of the respondents reported antibiotics use in the last twelve month, but there was no statistically significant difference between the two groups in this regard. Of those who reported antibiotic use the most common symptoms reported as the primary reason for taking the drugs was cough (16%) followed by sore throat (7.1%) and common cold (6.1%) while 35.2% (176) didn't answer the question.

During their last infection 20.9% of the respondents used amoxicillin, 7.5% metronidazole and 6.1% used co-trimoxazole as single drugs, 34.7% didn't specify the antibiotics taken. Those who took amoxicillin in combination with metronidazole accounted for 3%, amoxicillin together with co-trimoxazole 3.3% while amoxicillin plus ciprofloxacin were 1.9%. Amoxicillin was the most used antibiotic in either single or combination therapy. Up to 38.5% of those who were taking more than one antibiotic for their last infection had amoxicillin as one of them.

Discussion

We compared knowledge and attitudes on antimicrobial drugs and consumption patterns between students of the college of health sciences and the other non health sciences courses, at Makerere University Kampala Uganda. The data as expected suggested that at Makerere University, students of medicine and health sciences were more knowledgeable about antibiotics than the others. However, interestingly there was no statistically significant difference between the two groups when it came to the role of antibiotics in treatment of colds. In this study, fewer students thought that antibiotics had a role in common cold treatment

Table I. Gender and age distribution of the respondents

Age group	Gender			Totals
	Female	Male	Not Specified	
17-20	48	86	3	**137**
21-24	282	126	14	**422**
25-28	61	16	3	**80**
29-33	10	5	0	**15**
33+	3	1	0	**4**
Not specified	20	15	28	**63**
Total	**249**	**424**	**48**	**721**

Table II. The knowledge of the two groups on the antibiotic use

Questions	A (n)	A (%)	B (n)	B (%)	A&B(n)	A&B (%)	P
A. The aim of antibiotic use is:							
To decrease fever (T/F)	75/15	20.0	594/224	37.7	669/239	35.7	a
To overcome pain (T/F)	75/5	6.7	592/278	46.9	667/353	52.9	a
To overcome malaise and fatigue (T/F)	69/6	8.7	583/128	22.0	597/134	22.4	a
To treat common colds (T/F)	74/15	20.2	587/199	33.9	661/214	32.3	b
For infections	75/70	93.3	588/420	71.4	663/490	73.9	*a*
B. How antibiotics can be started:							
With antibiotic found at home in order not to waste time (T/F)	75 /3	4.0	563/102	18.1	638/105	16.5	a
On doctor's prescription (T/F)	75/73	97.3	587/504	85.9	662/577	87.2	a
With pharmacists advise (T/F)	75/43	57.3	585/410	70.1	660/453	68.6	a
Buy from drug shop (T/F)	75/10	13.3	583/182	31.2	685/192	28.0	a
C. Period of drug use:							
Until the drug is finished (T/F)	74/55	74.3	591/368	62.3	665/423	63.6	b
Until the symptoms disappear (T/F)	75/14	18.6	592/265	44.8	606/279	46.0	a
As advised by the doctor (T/F)	74/2	2.7	588/20	3.4	662/22	3.3	b
D. How often drugs should be taken in a day:							
After waking up in the morning and before sleeping at night (T/F)	74/6	8.1	584/121	20.7	659/127	19.3	b
Once a day	74/6	8.1	586/56	9.6	660/62	9.4	b
As per health worker advice	75/75	100	594/522	87.9	669/597	89.2	a
E. Inappropriate antibiotic use:							
Do you think frequent and inappropriate antibiotic use has any danger (T/F)	75/67	89.3	590/487	82.5	665/554	83. 3	b

T/F: true/false and percentages denote those who said 'True'.
'A' college of medicine and health sciences group, 'B' students from other colleges while be 'A&B' is total who responded to the particular question
a: P< 0.05 significant.
b: P>0.05 not significant.

when compared to a study done at a Turkish university.[16] Despite this encouraging level of knowledge, common cold was the third most frequent symptom for which antibiotics were taken. Perhaps this is in line with a Korean study that reported a belief among physicians and pharmacists that antibiotics offer some benefit in common cold.[17] In fact a study from Europe showed that self medication with antibiotics was influenced by prescribed use.[5] Therefore these two factors may be responsible for the common cold being one of the symptoms that respondents gave as reason for their use of antibiotics.

In the present study, 65.1% of all respondents (85.3% in Group A and 62.6% in Group B) started antibiotics without prescription when they felt ill and there was statistically significant difference between the groups. Additionally 16.5% in both groups felt that, when they are ill, starting antibiotics available at home was the best thing to do. This result was lower than that reported by

Table III. The attitude and behaviour of the two groups about the antibiotic use

Questions	A (n)	A (%)	B (n)	B (%)	A&B(n)	A&B (%)	P
A. Have you ever used antibiotics in order not to get ill (Y/N)	75/18	24.0	592/188	31.7	667/206	30.9	a
B. Have you ever started antibiotics by yourself	75/64	85.3	593/371	62.6	668/435	65.1	a
C. Have you ever used antibiotics given by the doctor irregularly (Y/N)	75/43	57.3	594/281	47.3	669/324	48.4	b
D. What do you do when you think that the antibiotic you are taking is not effective?							a
a. I stop taking it and go back to the doctor	74/26	35.1	598/301	50.3	636/247	36.7	
b. I stop taking it and go to another doctor	74/1	1.4	598/59	9.8	636/84	12.5	
c. I use it for the recommended period	74/34	45.9	598/184	30.8	673/274	40.7	
d. Other	74/13	17.6	598/51	8.5	673/53	8.1	
E. How did you get antibiotics during your last infection?							b
a. I used the antibiotic previously given and advised by my friends	72/10	13.8	564/81	14.5	636/48	7.5	
b. I used the antibiotic previously prescribed by my doctor	72/16	22.2	564/141	25.0	636/170	26.7	
c. I went to a doctor and used the prescribed antibiotic	72/34	47.2	564/252	44.7	636/399	62.7	
d. I asked the pharmacist and used the antibiotic advised by him	72/9	12.5	564/87	15.4	636/39	6.1	
e. Bought drugs and used	72/3	4.2	564/2	0.4	636/5	0.8	
F. How did you use antibiotics during your last infection?							b
a. Until the drugs got finished	73/15	20.5	568/97	17.1	641/176	27.5	
b. Until the symptoms disappeared	73/26	35.6	568/203	35.7	641/236	36.8	
c. As advised by the doctor	73/32	43.8	568/267	47.0	641/239	37.2	

Buke *et al*.[16] but it was significantly lower in Group B. A similar tendency of antibiotic self prescription among healthcare personnel has been reported by a study from Norway.[18] Therefore the significant difference could probably be due to the students of college of health sciences having confidence when it comes to knowledge on potentially effective antibiotics for illnesses in addition to easier drugs access. In fact easy access to drugs among health workers has been shown to contribute towards self and irrational prescription.[19] However, there was no difference in terms of use of antibiotics with a prescriptions between the two groups.

Interestingly although both groups agreed highly that the drugs should be taken until finished (Group A 74.3% and B 62.3%), they didn't act on this knowledge during their last antibiotic use. Other researchers have reported a discrepancy in knowledge and behavior.[16,17] Therefore, knowledge alone may not be sufficient to address antibiotic misuse. It must be complimented with removing the myths that surround their role in different ailments. The majority in both groups opted to follow the doctor's advice on the period of use but likewise a good number took them until symptoms disappeared. Taking antibiotics as per doctor's recommendation was rather encouraging because it gives health workers a window of opportunity to promote rational antibiotic use when prescribing to patients. However, the fact that inappropriate use accounted for about 50% means that health workers must be constantly reminded of antibiotic resistance, their role and ways in which to combat it. Therefore constant training and encouragement must be given to the health care workers. This has been shown to be effective in improving on antibiotic use.[20] We must hasten to add that as health care becomes more commercialized in the country, profit may take precedence over rational use making the training and encouragement ineffective as seen elsewhere.[21] Although over 83.3% of students thought that frequent and irrational antibiotic use has dangers, only 62.7% got the antibiotic and 37.2% used the antibiotic according to the prescription during their last infection. Therefore to ensure long-term success of rational antibiotic use efforts, both health workers and the general population must be educated so as to change their behaviour and attitude towards the use of these drugs in order to decrease emergence of resistant infectious agents.[22]

Amoxicillin was the most commonly used antibiotic by respondents, both as a single drug or in combination therapy. A study done in Uganda showed a high level of resistance to penicillin based antibiotics in

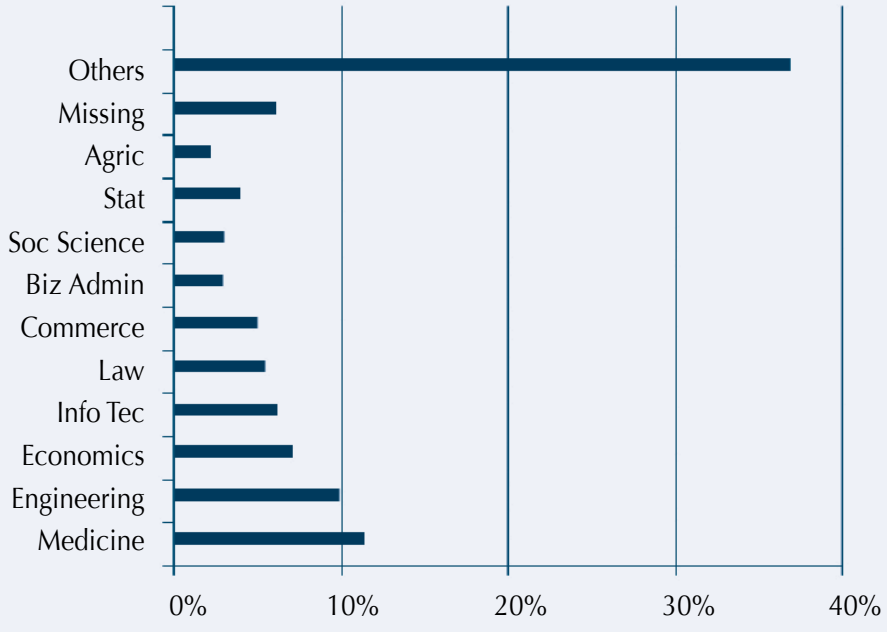

Figure 1: Names of programs with at least 16 students and their percentage representation

Streptococcus pneumoniae.[23] Since frequent exposure to a given antibiotic has been shown to promote drug resistance,[4] it's possible that this overuse could already have led to resistance but culture and sensitivity based research is needed to establish this. Given the patient to health care worker ratios in the country we need to come up with innovative area specific ways to promote rational drug use targeting both health care workers and the general public if we are to stem emergence of resistance.

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