Review of Literature: Scientific Report on Quite Often Misuse of Antibiotics

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ABSTRACT

This review of literature is done to investigate the occurrence of the misuse of the antibiotics in the healthcare and social settings around the world. Antibiotics plays an important role as the essential drugs used for many cases of disease treatments and it brings many adverse condition related to the misuse of the drugs in prescription and usage. Misuse of it brings about many implications such as incidence related with Antimicrobial Resistance (AMR) and other issues. The emerging drug resistances issue proves to be the result of the misuse of the antibiotics. The preventive measures need to be taken to deal with this issue of the antibiotic misuse that causes antibiotic resistance. In this review of literature, several related articles and journals were acquired through various reliable and valid resources. Multiple viewing and reading were done to pin point essential information for the results. The results portrayed that the antibiotics are one of the most often drugs being misused and brought serious implications to its usage in the healthcare settings and the society. Other than that, preventive measures were included in this review to provide better understanding in the eradicating of the misuse the antibiotics.

Keywords: Antibiotics; Misuse; Antimicrobial Resistance (AMR); Drug Resistance; Preventive Measures

Abbreviations: AMR: Antimicrobial Resistance; MRSA: Methicillin-Resistant S. Aureus; MBBS: Medicine & Bachelor of Surgery; BDS: Bachelor of Dental Service; OTC: Over the Counter; GIT: Gastrointestinal Tract; MRSA: Methicillin-Resistant Staphylococcus Aureus

Introduction

Antibiotics are one of the most commonly prescribed drugs in recent decades. It is the class of a drug which is commonly sold especially in developing countries (Buke, et al. [1]). An estimation of nearly one third of patients which were hospitalized were given antibiotics and accounts up to 40% of the hospital's drug budget. Rational use of it is very much important than the effectiveness of the drug itself. Recently, the misuse of antibiotics issue had been raised critically and affects the healthcare settings in various ways. The misuse or may be referred as overuse of antibiotics may have serious effects on health. The irrational use arises from the economic factors, health policies, lack of physicians' concern regarding long term resistance and the sale of the antibiotics without prescription (Metlay, et al. [2]). Patients can purchase any antibiotics over the counter in certain countries without prescription from physicians (Shankar, et al. [3]). In Jordan, it is revealed that inappropriate patterns of prescription and dispensing showed misuse of the antibiotics (Al Bakri, et al. [4]). This pattern of prescribing was also found to be practiced in Bangladesh as well. The incidence of self-medication with antibiotics is quite high in Jordan (Al Bakri, et al. [4]), Al Azzam, et al. 2007, Sawair, et al. 2009a.

These practices of antibiotics misuse cause the adverse effect on the health and may give rise to Antimicrobial Resistance (AMR) of certain types of microorganisms. For an example, Staphylococcus Aureus sp. is a type of bacteria of the normal flora which is able to adapt fast to the different environment condition (Lowy FD, et al. [5]), Chamber HF 2005. These characteristics have made Staphylococcus. Aureus sp. difficult to be treated with normal antibiotics which it had developed resistance strain in it to resist antimicrobial agent such as Methicillin-resistant S. Aureus (MRSA) due to various antimicrobial administrations (Okeke IN, et al. [6]). On further findings, the US Centre for Diseases Control and Prevention mapped the first case of the presence of the Vancomycin Resistant Staphylococcus Aureus sp.

(VRSA) [7]. This increasing risk of potential resistance brings fear to the world regarding the effects of the antibiotics misuse which leads to multiple drugs resistant bacterial strain. In order to deal with this occurrence due to antibiotics misuse, some strategies were included in this review to eradicate the problems uprising related to the misuse.

Objectives

1. To investigate the misuse of the antibiotics in usage and prescription.

2. Effects of antibiotics misuse and preventive measures of antibiotics misuse.

Material and Methods

Sources of Information

In this review, systematic review is done and various information and resources were found from available and reliable sources. Searches on online databases were done using the key words such as "Antibiotics", "Misuse" and "Effects" to locate relevant articles related to the topic. After searching and collecting all the required information, I did review by performing critical appraisal to identify the validity of the information. Important information was documented for further reviewing whereas the unrelated were kept aside. The sources are as follows:

Databases on Bio-medical research	Types
1. PubMed Central	Full length articles
2. Google Scholar	Full length articles
3. Science Direct	Full length articles
Online medical information sources	**Types**
1. Mayo Clinic	Latest articles
2. Medline Plus	Latest articles
RESULTS	

Search Results

After searching the required information related with the topic of the review by applying the strategies mentioned earlier in previous part of "materials and methods", the data of the searches are as follows:

- Articles:17

- Scientific webpages:3

- Scientific reports:3

- Medical books:1

All the articles are of full length.

Review of Literature

The Misuse of the Antibiotics in Usage and Prescriptions

Antibiotics are among one of the most common drugs had been used for decades. It also had been the drug classes which were demanded highly in the pharmaceuticals industry especially in the developing countries. In 1928, Sir Alexander Flemings, a Scottish pharmacologist made history by his discovery of the first antibiotic to be developed which is the Penicillin and it started to revolutionize the modern medicine [8]. It becomes one of the drugs which were commonly sold especially in developing countries where the demands for this drug is high (Buke, et al. [9]). Antibiotics had achieved a statement that it result in prolonged life expectancy of human [10]. The development of this precious drug had results in the over production and misuse of the drugs in the healthcare settings and society. Excessive use may render increased risk of drug resistance of the microorganisms. The irrational use of antibiotics arises due to factors such as economic factors, health policies, and lack of concern by the physicians regarding the effect of the long- term use of this drug which could bring about negative implications such as the development of antimicrobial resistant (AMR). The fact that this drug that can be obtain over the counter without prescription had become another reason for the overuse and misuse of the antibiotics in some countries (McNulty, et al. [11,12]).

In some countries as well, the patients are not restricted to access the local pharmacies to acquire antibiotics without proper prescriptions (Shankar, et al. [13]). In Jordan, research had revealed that inappropriate patterns prescription of the antibiotics by the physicians and dispensing of them is another factor of the misuse of the antibiotics4 and a cross sectional study design was carried out to identify the attitude and behaviour regarding the antibiotics use and misuse. This is to know the level of knowledge regarding the indications for antibiotics usage which may results in the misuse of the antibiotics. Based on the study done by the King Saud University,1500 questionnaires were distributed to the citizens of Jordan to obtain the information regarding the knowledge and behaviour regarding the antibiotic use among them. Out of it, 1141 were completed which accounts for about 76.1% response rate [14]. The results showed that 19.5% which accounts one fifth of the respondents were believed to use antibiotics for more than three times in the past year. The frequency of the antibiotic usage was portrayed in (Figure 1a). 40.9% of the respondents claims to purchase the antibiotics from local pharmacies with physician's prescriptions, while 30.0% of the respondents acquired the antibiotics without doctor's prescription from the pharmacies available by over the counter (OTC).
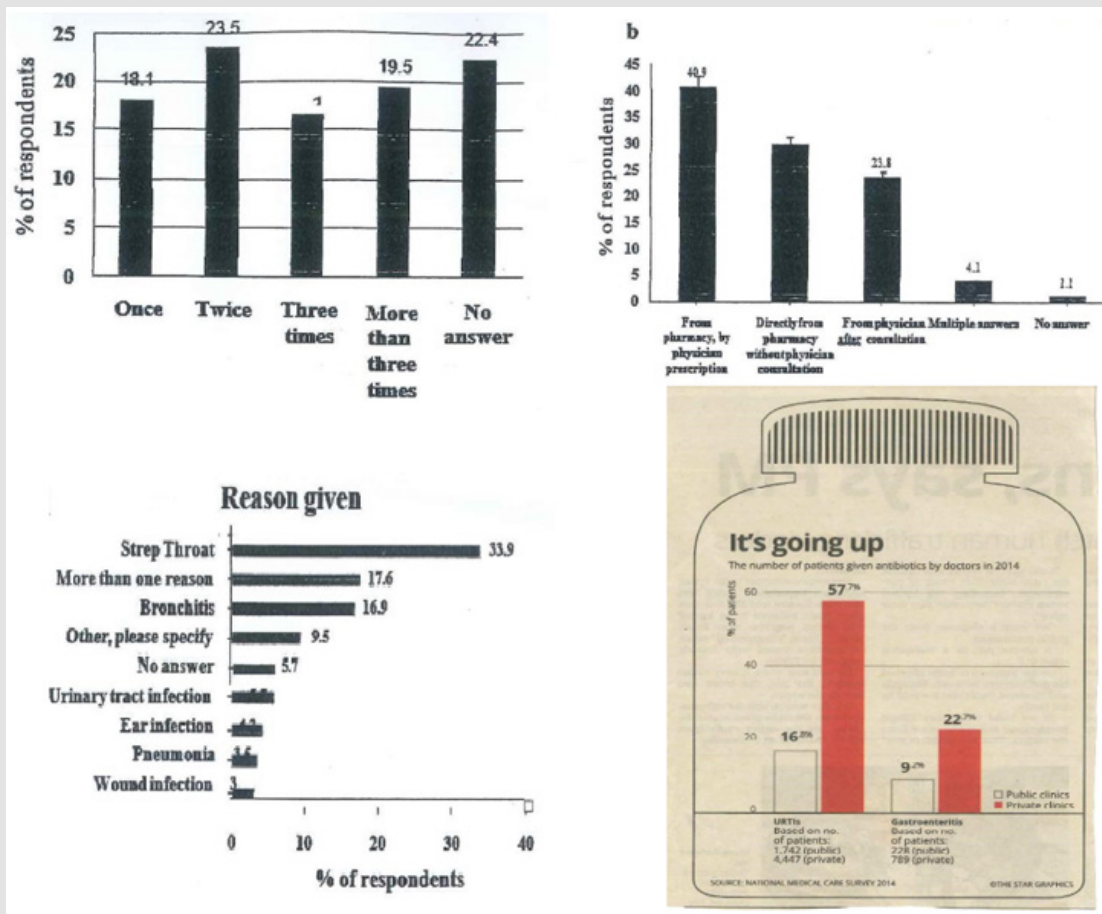
Note: (*M. Shehadeh*, Saudhi Pharmaceutical Journal (2020) 20, 125-133) [14].

Figure 1:

a)   The frequency of antibiotics use by the respondents.

b)   The sources of antibiotics obtained by the respondents.

c)   The respondents received antibiotics at least once .obtained by the respondents.

d)   Represents the increased usage of antibiotics with the passage of time (Sunday star Malaysian newspaper, 31 May 2015).

Figure 1b summarizes the sources of the antibiotics obtained by the respondent in the past year. About 33.9%and 16.9% of respondents of Group A took antibiotics for sore throat and bronchitis, respectively as shown in (Figure 1c). Figure 1d represents the increased usage of antibiotics with the passage of time. The knowledge level regarding the use, effectiveness of antibiotics usage was evaluated and presented in the (Table 1). The information in the table represents that the respondents were less knowledgeable about the antibiotics whether it was active against bacteria, viruses and/or parasites. There is no significance can be found that the level of knowledge regarding the effectiveness of the antibiotics in treating common cold between the respondents in Group A and B. Out of the total respondents, 32.9% agreed correctly that antibiotics are effective against only bacteria Whereas 6.9% wrongly agreed that antibiotics are effective against viruses. On the other side, 9.7% of the respondents believed that antibiotics have the same effects of antipyretic drugs to reduce symptoms of fever while 28.2% that they possess the same function as pain-killers. Furthermore, about 51% of the responses agreed that antibiotics able to resolve on common cold, cough and nasal congestion (Table 1).

Table 1: The Knowledge of responder regarding antibiotic use.

Statements Evaluating Indication and Efficacy of Antibiotoics	Group Aᵃ		Group Bᵇ		Total		p
	Number / Total	Percent Agreeing	Number / Total	Percent Agreeing	Number/total	Percent Agreeing	
(A) The aim of Antibiotic use for							
Fever	89/895	9.8	22/284	9.8	110/1129	9.7	0.08
Viral Infection	69/895	7.7	9/284	3.8	78/1129	6.9	0.08
bacterial infection	295/895	33.0	76/284	32.5	372/1129	32.9	0.08
Parasitic infection	9/895	1.0	-	-	9/1129	0.8	0.08
both viral and bacterial infections	164/895	18.3	48/284	20.5	212/1129	18.8	0.08
Bacterial viral , parasitic and fever	195/895	21.8	60/284	21.4	845/1129	31.7	0.08
Bacterial infection with fever	25/895	2.8	4/234	1.7	29/1129	3.6	0.08
Viral infection with fever	1/899	0.1	1/234	0.4	2/1129	0.2	0.08
Common cold,coughand nasal corgestion	441/845	63.2	108/219	47.0	544/1064	51.1	0.44
Stomuch ache	263/895	28.3	65/232	28.0	318/1127	28.2	0.75
The treatment of sore throat	306/831	36.0	12/161	7.5	318/937	33.9	<0.01
(B) an Antibiotic will always be effective in the treatment of same infection in the future	341/886	27.2	52/329	22.7	295/1116	26.4	0.37
(C) Antibiotic resistance is due to :	304/848	86.1	79/231	35.7	385/1168	36.0	0.36
Not complexing the full course of antibiotic	557/903	61.8	143/239	60.9	702/1141	51.5	0.75
Using antibiotic without Physician Prescription(self medication)	232/902	35.7	72/235	30.6	305/1141	26.7	0.37
Taking antibiotic before meal	95/902	10.5	37/235	11.5	122/1141	10.7	0.82
Using antibiotic in febrile illness	187/902	20.7	43/235	18.3	230/1141	20.2	0.72
Taking antibiotic with another drug (Drug Drug interaction)	101/903	11.2	23/235	9.4	124/1141	10.9	0.81
Using the same antibiotic with a different brand	117/903	13.0	81/235	13.2	140/1141	13.0	0.95
(D) Antibiotec safety							
Antibiotics could be harmful for children's teeth	595/895	66.4	116/233	49.8	762/1132	68.3	0.01
Antibiotic might develop allergy leading	614/891	68.9	165/328	72.4	781/1123	69.6	0.01

Note: Group A: respondents who reported receiving antibiotics during the last year
Group B: respondents who reported not receiving antibiotics during the last year
Total percentage denote those who answered the question and agree with the statement. Statement used in scoring respondents knowledge .

(*M.shehadeh*, Saudi Pharmaceutical Journal (2012)20,125-133)

It was also reported that about one third of the respondents which accounts for 38.5% agreed that antibiotics effectiveness would not be affected by the misuse of not completing the full course of the antibiotics. Only 36.0% claims that antibiotics would not be effective if it is overused. In both study groups of A and B, their awareness regarding antibiotics possible adverse effects were very low since 33.2% of them does not know that certain antibiotics could bring harmful effects (e.g. effects on children's teeth) and 41.6% denies the statement that antibiotic may develop implication such as allergies which may leads to death of the patient. In other situation, the antibiotics misuse took into place by the method of prescribing patterns where the medical practitioners play the major role that causes the misuse of the antibiotic's distribution simply for any types of diseases. The knowledge for antibiotic usage is essential to utilize the benefits optimally and

need to be given by a qualified Physicians. Based on the research done (Biswas, et al. [15]). The present research represents a cross-sectional study which was carried in three different cities named Jessore Sadar, Manirampurand Keshabpur upazila in the district of Jessore under Khulna Division of Bangladesh.

The first survey was done to describe the prescription obtained from different healthcare professionals in these three cities. The results found that in these three cities, averagely 29% patients visited Bachelor of Medicine & Bachelor of Surgery (MBBS) doctors, 63% of the patients surveyed went to Quack doctors whereas only 8% of the patients recorded visits the Bachelor of Dental Service (BDS) doctors. The information was presented in (Figure 2). Variations in the results showed that in Jessore Sadar, 76% of patients visited MBBS doctors. But in Manirampur and Keshabpur, the highest percentage of patients

visited Quack doctors which accounts 92% and 93% respectively. In all the cities, number of patients which visits the BDS doctors carries the least percentage as shown in the (Figure 2). Further studies was carried out in order to obtain the information of the usage and prescriptions of the antibiotics for the outpatients within these three cities. The data was tabulated in (Table 2). The mean of the highest prescribed antibiotic groups in these three cities were cephalosporin (31.78%), macrolides (27.33%), quinolones (16.33%), penicillin (7.11%) and metronidazole (6.78%) (Table 2). Cephalosporin was prescribed the highest in Keshabpur upazila (34.22%) whereas lowest in Manirampur upazila (29.67%).
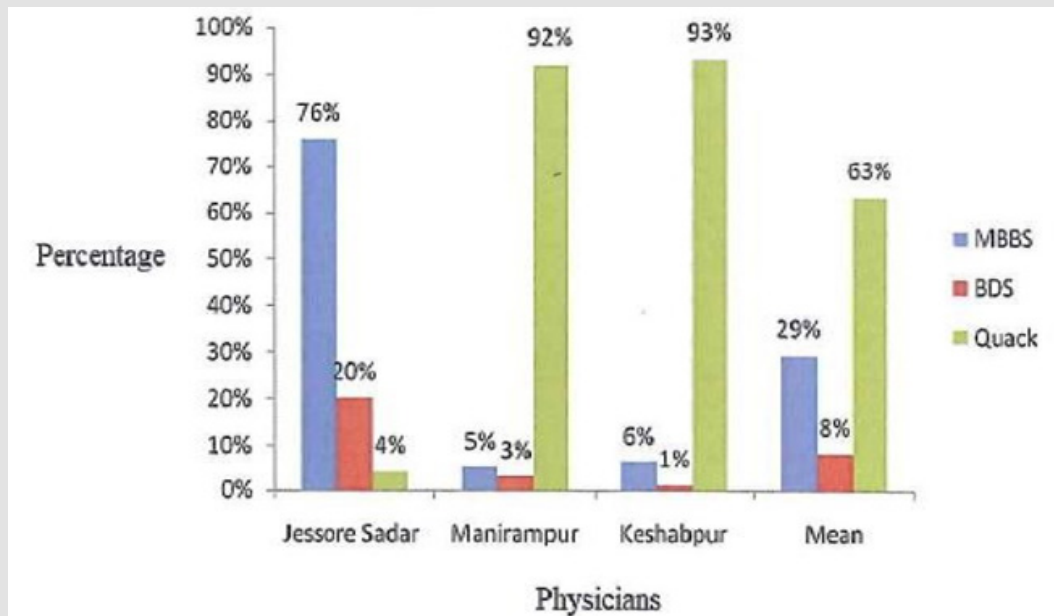
Note: (Prescription antibiotics for outpatients in Bangladesh: A cross-sectional health survey Conducted in three cities. 2014 13:15.)
Figure 2: Prescriptions obtained from different health care professionals.

Table 2: Frequency of prescribed antibiotics.

Group of Antibiotic with ATC code	TNP (N=900)			IP(%)			AVP (%)	SD	95% Cl
	JES(n=300)	MAPR(n=300)	KEPR(n=300)	JES	MAPR	KEPR			
Cephalosporins(J01D)	94	89	103	31.33	29.67	34.33	31.78	1.93	31.56 to 32
Quinolones (J01M)	85	44	18	28.33	14.67	6.00	16.33	9.19	15.28 to 17.34
Macrolides (J01f)	25	98	123	8.33	32.67	41.00	27.33	13.86	25.75 to 28.90
Aminoglycosides(J01G)	5	3	4	1.67	1.00	1.33	1.33	0.27	1.29 to 1.36
Pencilins (J01C)	36	17	11	12.00	5.67	3.67	7.11	3.55	6.71 to 7.51
Antituberculers (J04A)	20	2	1	6.67	0.67	0.33	2.56	2.91	2.23 to 2.89
Tetracyclins (J01A)	6	4	8	2.22	1.33	2.67	2.00	0.54	1.94 to 2.06
Metronidazoles (J01XD01)	13	27	21	4.33	9.00	7.00	6.78	1.91	6.56 to 6.99
Antifungals (J01X)	6	11	8	2.00	3.67	2.67	2.78	0.68	2.70 to 2.86
Other antibiotics	10	5	3	3.33	1.67	1.00	200	0.98	1.89 to 2.11

Note: Here, JES=Jessore sadar, MAPR=Marirampur, KEPR= Keshabpur, TNP=Total Number of Prescriptions, IP: Individual Percentage, Avp =Average Percentage SD: Standard Deviation calculated by Ms office Excel-2007,95% CI=confidence Interval Calculated by Modified Wald method at 95% Confidence Level (Biswas et al.: Prescription antibiotics for outpatients in Bangladesh: A cross sectional health Survey conducted in three cities .2014 13:15.)

These antibiotics were commonly prescribed for patients suffering from respiratory tract infection (RTI), urinary tract infection (UTI), cesarean patients, typhoid fever etc. Next after the cephalosporin, the highest usage of antibiotics was macrolides which were prescribed in Keshabpur the highest (43%). In Jessore Sadar, it accounts the lowest usage of macrolides of (8.33%) is used for curing cold and fever. Quinolones were prescribed highest in Jessore city (28.33%) whereas the lowest in Keshabpur which was only (6%). These were used for the condition of typhoid fever, respiratory infections and gonorrhea. In Jessore city as well, penicillin was prescribed the highest about (12%) while the lowest was at Keshabpur (3.67%) and given mainly for the recovery of bruises and wounds. Other than that, metronidazoles was prescribed as the highest in Manirampur (9%) followed by the lowest in Jessore city (4.33%) and used for the purpose of diarrhea and dysentery (Table 2). In 74.56% of the prescription, single antibiotics was prescribed whereas two or more antibiotics were prescribed for 25.44% of the prescription. 68.89% of the total prescription have complete information regarding the dosage form, 57% has complete direction for antibiotics use and 83% of the prescriptions have no clinical test for prescribing antibiotics. Total of 64.22% patients completed their full course of antibiotics and the percentage of disease recovery was 61.78%. 38.22% of the patients complained to have side effects after taking the prescribed antibiotics.

Effects of Antibiotics Misuse

Antibiotics are believed to be the cure all disease once and had been used in broad spectrum to treat many diseases. Despite of its use which brings benefits, these drugs also cause many implications and adverse effect. In this era, antibiotics have been overly used and results in multiple drug resistant microorganisms. These microorganisms cause many diseases in humans which is difficult to be dealt with in terms of treatments due to the development of the resistant strain in the microorganism which counters the effect of antibiotics causing the failure in a course of treatment. These microorganisms if given with suitable condition and time enables them to adapt to almost extreme situation in order to survive a particular condition. This is believed to be mainly due to the antibiotics overuse and misuse by humans. Improper management and treatment and also inappropriate utilizing of antibiotics are the primary reason for the access of the antimicrobial resistance (AMR) development. A study was done in Niger Delta University. Wilberforce Island, Amassoma, Bayelsastate, in Nigeria by randomly selecting 120 subjects which consists of the students and villagers. The purpose of the study to identify isolates of the common normal flora of the gastrointestinal tract (GIT) such as Staphylococcus Aureus sp. in the intestine.

This is done to investigate the effect of previously taken antibiotics by the subjects on the normal flora or microorganisms which harbour's normally in the GIT. Questionnaires from the subjects were retrieved and the results were tabulated. Based on the results obtained, fifty-four (45%) of the students and the villagers had taken antibiotics by themselves in which 34(63%) were villagers while the remaining 20(37%) were the students. The information was provided in the (Table 3). Twenty-five (41.7%) students and 10 (16.7%) villagers used their antibiotics prescribed judiciously as shown in the (Table 4). The distribution of the microbial agents used on selfmedication by the subjects is portrayed in the following (Figure 3). Besides from the isolation of the bacteria, the bacteria were undergone with antibiotic susceptibility test by using two method of-

1) Agar diffusion test (zone of inhibition)

2) Agar dilution method (MIC-minimum inhibitory concentration Test)

Table 3: Use of antibiotics by subjects.

Type of use	Students (n=60)		Villagers (n=60)		Total (n=120)		P value
	No.	%	No.	%	No.	%	
Use of antibiotics on self medications	20	33.3	34	56.7	54	45.0	0.01
Use of antibiotics prescriptions	40	66.7	26	43.3	66	55.0	0.01

Note: Source: J Health popul Nutr 2011 Oct .29(5) 446-453, Department of Pharmaceutical microbiology and Biotechnology, Niger Delta University, Wilberforce Island, Bayelsa state, Nigeria

Table 4: Antimicrobial resistance profile of volunteers' intestinal *S. aureus* isolates.

Antimicrobial Agents	No. of Resistant *S. aureus* Isolates					
	Overall (n=38)		Students (n=20)		Villagers (n=18)	
	No.	%	No.	%	No.	%
Ampicillin (10 µg)	26	68.4	16	80.0	10	55.6
Augmentin (30 µg)	7	18.4	3	15.0	4	22.2
Cefuroxime (30 µg)	9	23.7	7	35.0	2	11.1
Gentamicin (10 µg)	2	5.3	1	5.0	1	5.6
Ciprofloxacin (5 µg)	3	7.9	2	10.0	1	5.5
Ofloxacin (5 µg)	3	7.9	0	0.0	3	16.7
Chloramphenicol (30 µg)	13	34.2	4	20.0	9	50.0
Co- trimoxazole (25 µg)	14	36.8	5	25.0	9	50.0
Doxycycline* (30 µg)	23	60.5	10	50.0	13	72.2
Erythromycin (15 µg)	13	34.2	8	40.0	5	27.8
Cefoxitin (30 µg)	13	34.2	5	25.0	8	44.4
Vancomycin (30 µg)	14	36.8	8	40.0	6	33.3

Note: Source: J Health Popul Nutr 2011 Oct. 29(5) 446-453, Department of Pharmaceutical Microbiology and Biotechnology, Niger Delta University, Wilbeforce Island, Bayelsa State, Nigeria.
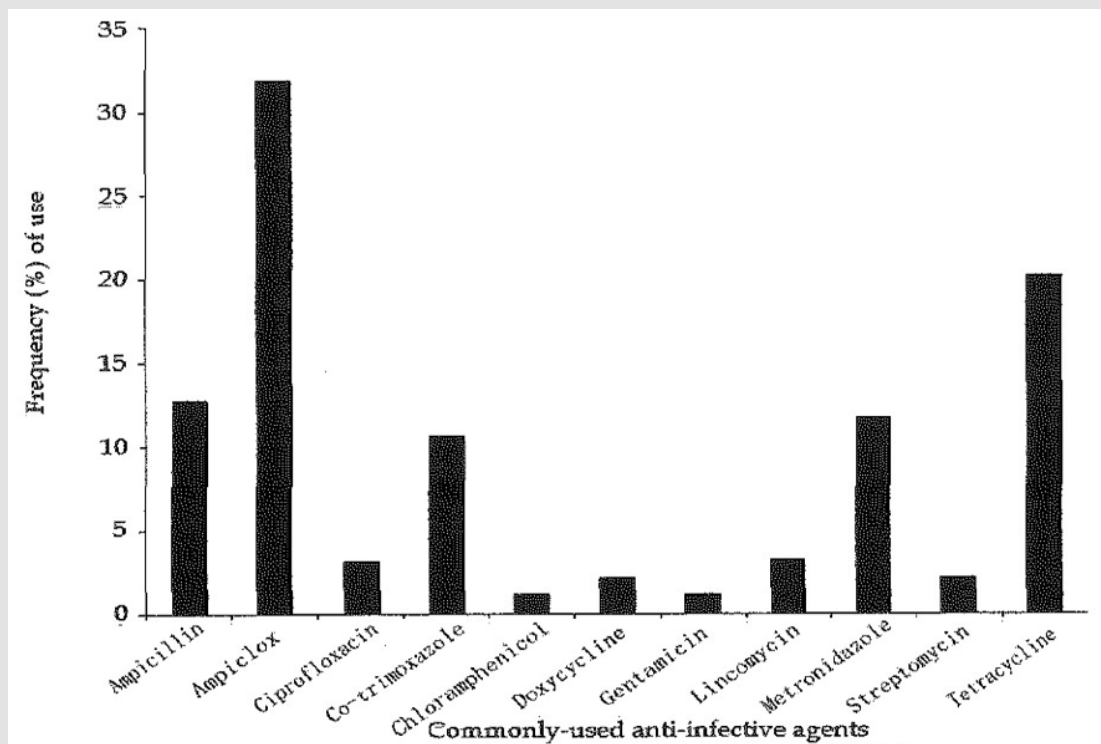
Note: Source: J Health popul Nutr 2011 Oct.29(5) 446-453, Department of pharmaceutical Microbilogy and Biotechnology, Niger Delta University, Wilberforce Island, Bayelsa State, Nigeria
Figure 3: Distribution of frequently used Antimicrobial agents by- study Subjects.

The test for the agar diffusion test, six common antibiotics were used for this test

For the other test, another six antibiotics were prepared which were the antibiotics commonly used as follows-

a) Vancomycin

b) Ampicillin

c) Erythromycin

d) Chloramphenicol

e) Amoxicillin-clavulanic acid (Augmentin)

f) Cefuroxime

The isolates represented high resistance to ampicillin, doxycycline, co-trimoxazole, erythromycin and chloramphenicol. On the other side, there were only mild level of resistance of the isolates to cefuroxime, Augmentin, ciprofloxacin, ofloxacin, and gentamycin (Table 4). The pattern of antimicrobial agents' resistance between the isolates from the male and female were compared. There were marked significance in level of resistance of doxycycline by the females' isolates. Methicillin-resistant Staphylococcus Aureus sp. (MRSA) were identified in 13 (34.2%) of the 38 isolates, all of which were resistant to three or more agents tested. The isolates with decreased susceptibility to Vancomycin were 14(36.8%), of which 8 were MRSA. The increase in the MRSA infections prevalence in the community should be taken into great concern as is arising and the root problem should be eradicated such as the antibiotics misuse which drives the problem [16]. This problem is something that should be feared of by the medical society as it becomes difficult to keep up with fighting the microorganisms where the window of antibiotic effect is narrowed due to resistant development [17-22].

Discussion

Nowadays, antibiotics misuse had become a no longer rare case that had been occurring in the healthcare settings. In this review, the results of the review have clearly stated that the respondents believed to take antibiotics from past years. More than three types of antibiotics were used for many reasons by the respondents without proper prescription from physicians and been using it without their consult which leads to inappropriate use. One-third of the people took antibiotics for inappropriate illness which may resolve by itself without even the need for the antibiotics use. The study also shown that knowledge of taking antibiotic is poor in the patients in which they did not understand that antibiotics are not effective against viruses than bacteria which is sensitive to antibiotics. Some of them misinterpret wrongly that antibiotic have the similar effects of giving relief to fever as anti-pyretic drugs do. This explain wrong indications for antibiotics prescription. Part of the patients in this study immediately stops the course of antibiotics as soon as the symptoms of the condition resolves slightly which leads to improper treatment for the disease.

This condition may result in the recurrent occurrence of the disease which may develop resistant in the next infection. Not finishing the full course of antibiotics impersonates the misuse of the antibiotics.

Another situation where the medical practitioners often prescribe antibiotic excessively for almost any indications without any reason for its treatment. This can be explained by the numbers of quack doctors available in the settings which were not accredited by the authority. In some countries, the availability of this type of doctors causes many unmonitored distributions of antibiotics to the community which lacks socioeconomic value and unable to access the proper practitioners. The quack doctors don't have proper understanding regarding the use of specific antibiotics for different indication. In Bangladesh, the statistics proves that majority of the prescription have no clinical testing for the use of the drugs. Excessive use of first line of antibiotics treatment develops resistance and forced the usage of the stronger antibiotics need. Antibiotics misuse had brought into a new situation of antimicrobial property by the microorganisms. The development of methicillin resistant staphylococcus aureus sp. (MRSA) is an example of the effect of the misuse. For instance, multiple drugs administration in the Gastrointestinal tract (GIT) causes the exposures of the normal flora of the GIT to develop multiple drug resistance such as the commonly used drugs like cephalosporin, macrolides and many more.

Isolates of resistance to four type of antibiotics proves this situation of multiple drug resistance. The effect of misuse had evoked the higher board of practitioners to intervene measures such as introducing antimicrobial stewardship event. Interventions such as having antibiotics list enables the healthcare settings to monitor strictly the use. This enables also the registry of the antibiotics in hospitals to be systematic. A guideline to the use of the antibiotics in particular indication is an essential approach in the usage of antibiotics accordingly. This optimizes its use. A database should be established in order for the particular institution to govern the rate of antibiotic consumption. This will lead to proper management of antimicrobial use and ensure effectiveness.

Danish Researchers Link Antibiotic to Heart Disease

(Malaysian star news, Thursday 21 August 2014, 33). Danish researchers reported a link between a commonly- used antibiotics and a "significantly" higher risk of heart deaths, while observers urged caution in interpreting the results. In a study published online by the British Medical Journal (The BMJ), the team said Clarithromycin use was associated with 76% higher risk of cardiac death, compared to use of Penicillin V. The absolute risk difference was 37 cardiac deaths per one million courses with Clarithromycin, reported the trio from the Statens Serum Institute's epidemiology department in Copenhagen. The risk stopped when treatment ended. Clarithromycin is prescribed to million of people every year, to treat bacterial infections like pneumonia, bronchitis and some other skin infections. The team had analysed data from more than five million antibiotics courses given to

Danish adults aged 40-74 in the period of 1997-2011. Of the patients, just over 160,000 had received Clarithromycin, 590,000 Roxithromycin and 4.4 million of Penicillin V. Clarithromycin and Roxithromycin are macrolide antibiotics that effect the electrical activity of the heart muscle and are thought to increase the risk of fatal heart rhythm problems, the researchers said. No increased risk was observed with Roxithromycin. While the absolute increase in risk with Clarithromycin was small, it was "one of the more commonly used antibiotics in many countries....thus the total number of excess cardiac deaths may not be negligible".

Conclusion

Basically, this review had shown that antibiotics are being misused in many ways. The misused includes the attitude, behaviour and knowledge of the patients towards the improper consumption of antibiotics. Besides that, medical practitioners also play important role in prescribing the drugs excessively and inappropriately. This is done without required clinical testing for the right indication for the drug use. The prescription by unauthorized doctors is also the factor that leads to antibiotics misused by giving antibiotics without knowledge of its pharmacological actions. Regards of the antibiotics misuse, the emergence of the multidrug resistance of certain microorganisms such as Staphylococcus Aureus sp. had aroused many concerns of the ability of the microorganisms to develop resistant strain. Administration of multiple drugs holds the major reason of the emergence of the isolates of staphylococcus aureus sp. resistance to antibiotics especially in the gastrointestinal tract (GIT). Improper course finishing of antibiotics treatments results in the recurrent infections with more resistant of the previously administered drug. This needs a wider spectrum of antibiotic for next treatment. This makes it harder to eradicate the infection problem in future predicted. Various interventions can be done to deal with the misuse of the drugs such as antibiotics list for proper documentations of the drug use. Antibiotics guidelines is an essential method to ensure the correct indication for particular treatment. In long run, the governance of the consumption rate of antibiotics will make more institution to benefits in eradicating the antibiotic misuse progress.

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