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## Antibiotics Utilization and Adherence Pattern in Ajman/UAE

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### ABSTRACT

Antibiotic (AB) consumption in UAE is rising with physicians prescribing these drugs for simple ailments like common cold and sore throat. The aim of this work is to identify the utilization pattern of AB in UAE to determine patient's perspective and involvement in the use and abuse of AB and to estimate people awareness about AB abuse and its complication. A validated, self-administered questionnaire was used for data collection. Data was analyzed by using descriptive statistics and chie-square test when applicable. This cross sectional study was carried out among subjects procuring AB from GMC pharmacy, GMC hospital and community pharmacies located in Ajman. Two hundred and thirty three subjects were participating in this study, 58.8% female and 41.2% male. Majority of participants were Asian and more than forty years old. 41% of participants have purchased AB without doctor's prescription and 56% of the lot didn't seek pharmacists advise. About 25% use AB that purchased previously and 19.7% switched over to another AB if symptoms not relieved. 44.2% use AB for cold or running nose and 26.6% for respiratory tract infection. There was a marked preference to the use of augmentin and amoxicillin followed by cefuzime and erythromycin. Participants' adherence to AB therapy was poor. Results showed a significant association between participants occupation and subjects adherence to AB therapy ( $P<0.002$ ) and participants awareness of AB abuse ( $P<0.001$ ). In conclusion people awareness and knowledge towards AB utilization and complication associated with AB abuse in Ajman/ UAE is low. Antibiotic use regulation is recommended with mass education program by different health authorities to promote appropriate AB use and prevent AB resistance.

**Keywords:** Antibiotic, Utilization, Misuse, Adherence, Knowledge, Complication.

### INTRODUCTION

Antibiotic (AB) misuse is a common phenomenon in the present world for people in the form to procure antibiotics over the counter for illnesses that are not caused by bacteria, or to take improper doses. Misuse of AB can also be in the form of inappropriate prescription which can be attributed to a number of causes including patients insisting on AB, physicians prescribing them simply as they feel they do not have time to explain why they are not necessary, physicians who do not know when to prescribe AB or else are overly cautious for medico-legal reasons and those who just prescribe for economic reasons (Rosmans *et al.*, 1996) (Arnold *et al.*, 2005) (Spatuzza, 2008).

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AB resistance has been described as a major threat to global public health by the World Health Organization because there are now few and in some cases no AB available to treat certain life threatening infections (WHO 2000). AB use is viewed as a key driver for the increase and spread of AB resistance (Nordberg *et al.*, 2004). Observation has shown that the lack of effective monitoring and enforcement of controls on the sale and use of AB is the main cause of growing resistance of the world's microbes to antimicrobial drugs (WHO, 2008). The widespread use of AB both inside and outside of hospital setup has been found to play a significant role in the emergence of resistant bacteria (Goossens *et al.*, 2005) whilst the volume of antibiotic prescribed is the major factor in increasing rates of bacterial resistance rather than compliance with AB (Pechere *et al.*, 2001). In UAE AB and painkillers are the most prescribed medicines by physicians, with spending on AB in the Capital accounting for over Dh200 million. Antibiotic consumption in the UAE is rising with physicians prescribing these drugs for simple ailments like common cold and sore throat (ADMC, 2012). Antibiotic self medication is a relatively frequent problem in Abu Dhabi (Abobakr *et al.*, 2009), interventions are required to reduce the frequency of AB misuse. Antibiotic use is an area where physicians in the primary health care centers can coordinate with a multidisciplinary team, including other health professionals such as pharmacists and microbiologists for assuring optimum drug use (Mohamed *et al.*, 1997). In UAE AB are sold without prescription. The aim of this work is to identify the utilization pattern of AB in UAE/ Ajman to determine patient's perspective and involvement in the use and abuse of AB and to estimate people awareness about AB abuse and its complication.

## MATERIALS AND METHODS

This cross sectional study was carried out among subjects procuring AB from GMC pharmacy, GMC hospital and community pharmacies located in Ajman. Only subjects willing to participate in this study were included. Data collected through a structured and validated self administered questionnaire. A nonrandomized sampling strategy was used. Collection of data was done twice weekly during study period. The questionnaire divided into two parts. The first part included information on socio-demographic characteristics of the participants, such as age, gender, nationality and level of education. The second part included twenty questions focused on AB utilization, hospital attendance, type of AB purchase, whether AB purchase based on prescription or pharmacists advise or others, reasons for AB purchase, AB purchasing based on presence or absence of any symptoms, adverse reactions to AB, knowledge of AB abuse, alternative AB used, source of obtaining alternative AB, improvement after alternative AB, any specimen was taken for further lab investigation, adherence to AB therapy and awareness about complication associated with AB and its management. The questionnaire completed by the subjects or for illiterates by the interviewer in the same study period. Evaluation of antibiotic utilization parameters: compliance of the patients to drug

treatment, drug discontinuation, switching over to another antibiotic, or addition of another antibiotic, upward or downward titration of the dose of antibiotic and utilization of alternative antibiotic medication. The collected data was pooled and analyzed using PASW version 18 (IBM Chicago, Illinois). The study was approved by the Ethics Committee of the Gulf Medical University before the start of the study. For ethical considerations verbal consent was taken from the participants before enrollment in the study. Confidentiality of the participants was preserved.

## RESULTS

The study include 233 participants, 180 from Ajman and 53 subjects were from Sharjah (purchasing AB from community pharmacies located in Ajman). Table 1 shows the distribution of the studied participants by gender, age and occupation.

**Table 1:** Demographic distribution of participant.

Age (yrs)	Number	Percent
<40	195	83.7
>40	38	16.3
Gender	Number	Percent
Male	96	41.2
Female	137	58.8
Occupation	Number	Percent
Healthcare	49	21.0
Non-Healthcare	184	79.0
Nationality	Number	Percent
Middle east	85	36.5
Asian	116	49.8
Others	32	13.7

**Table 2:** Number (%) response of AB purchasing and utilization pattern.

Variable	Frequency	Yes% n=233	Frequency	No% n=233
<b>Purchasing of AB</b>				
Do you use AB?	220	94.4	12	5.58
Do you purchase AB from Hospital?	30	12.8	203	87.1
Do you buy AB?	208	89.3	25	10.7
Do you purchase with prescription?	137	58.8	96	41.2
If without prescription do you seek a pharmacist advice?	42.0	43.7	54	56.3
Do you purchase AB based on symptoms of any disease?	170	72.9	63	27.0
Do you take AB you purchased previously?	58	24.9	175	75.1
<b>Utilization of alternative AB</b>				
Do you use alternative AB?	46	19.7	187	80.2
Is alternative AB recommended by physician?	15	32.6	31	67.4
Does physician prescribe alternative AB based on lab investigation?	5	10.9	41	89.1
<b>Utilization of AB</b>				
Do you know AB abuse is not healthy?	105	45.1	128	54.9
Do you think AB usage is as safe as OTC?	139	59.7	94	40.3
Do you have any adverse reaction of AB therapy?	81	34.76	152	65.4

The majority of participant was female 58.8%. Most of participants were >40 years old. It can be seen that high percentage of participants was Asian and most of participants 79% without

health care occupation. Table 2 shows number percentage (%) response for AB purchasing and utilization pattern. About 59% of participants were purchased AB with prescription as medical insurance system is applied in UAE. 41% of participants purchased AB without doctor's prescription and 56.3% of the lot did not seek pharmacists advise. About 25% of participants purchased AB that utilized previously. As such as 19.7% indicated the AB when first used did not relief symptoms so they shifted to an alternative AB. 32.6% of alternative AB was recommended by physician and only about 11% was based on lab investigation like urine or sputum culture. 45% of participants agreed that AB abuse is unhealthy although 27.0% of participants purchasing AB didn't base on any disease signs or symptoms. About 60% of participants considered AB as safe as OTC drugs and about 35% complained from side effects like rash 20.9% (n=17), diarrhea 23.5% (n=19) and nausea 28.4% (n=23) and others 27.1% (n=22). Table 3 shows number (%) of reasons for which AB is utilized. Cold and running nose was the most common reason for AB utilization 44.2% followed by respiratory tract infection 26.6%. Type of AB utilized as number (%) is shown in Table 4. There was a marked preference to the use of augmentin and amoxicillin followed by cefuzime and erythromycin. Table 5 shows number (%) response of participants' awareness towards AB therapy adherence. 33% of participants stopped AB therapy when symptoms relieved and about 37% of participants if not feel better switched over immediately to another AB. There is significant relation between AB adherence and participants healthcare occupation (p<0.002). Table 6 shows number (%) of participants' awareness towards complications of AB abuse. The lowest knowledge response was 27% for GIT normal flora damage by AB therapy and the highest knowledge response 46% for allergy and adverse reaction associated with some AB.

**Table 3:** Number (%) common reason for AB utilization .

Reason	number	Total 100 % ( n= 233)
Cold & runny nose	103	44.2
Respiratory tract	62	26.6
Toothache	20	8.6
Ear & eye infection	18	7.7
UTI	23	9.9
GIT	7	3.0

**Table 4:** Number (%) type of antibiotics used.

Antibiotic Name	number	Total 100 % ( n= 233)
Augmentin, julmentin	85	36.5
Amoxicillin, Amoxil	70	30.0
Cefuroxime, Cefuzime	33	14.2
Erythromycin	30	12.9
Clarithromycin	11	4.7
Azithromycin	4	1.7

**Table 5:** Number (%) of participants' awareness towards AB therapy adherence.

AB Adherence*	Number	Yes % n=233	Number	No % n=233
Regular use of AB	69	29.6	164	70.4
Follow doctors or pharmacists instruction	165	70.9	67	28.8
Stop AB after symptoms relief	77	33.0	156	67.0
Change AB immediately if symptoms not relief	85	36.5	176	75.5

\*P<0.002.

**Table 6:** Number (%) of participants' awareness towards complications of AB abuse.

Complication*	Number	Yes % ( n= 233)	Number	No% ( n= 233)
Resistance	76	32.6	157	67.4
Allergy & adverse reaction	107	45.9	126	54.0
AB killing normal Flora	63	27.0	170	73
Overdose of AB	102	43.8	131	56.2

\*P<0.001

Awareness about complication associated with AB abuse is significantly affected by participants with health care occupation (P<0.001).

## DISCUSSION

Different factors such as social circumstances and existing health care system influence AB use and misuse in various part of the world. In this study more the 94% of studied sample were use AB. 41.2% of participants purchasing AB from community pharmacy without prescription more than half of them 56.3% did not seek a pharmacist advise, this is in agreement with another study conducted in Abu Dhabi (Abobakr *et al.*, 2009). About 73% purchasing AB based on symptoms of disease and 25% purchase an AB that used previously. The majority of participants were from Asia 50% followed by middle eastren 37% where the prevalence of AB self medication was also high (Bezansskeyte *et al.*, 2006) (Awad *et al.*, 2005), (Andrajati *et al.*, 2005). This indicates that social and cultural factors have a positive impact on AB use and misuse. Moreover AB can be purchased easily from community pharmacies due to a lack of high disciplinary regulations in these areas although AB guidelines and associated interventions have been demonstrated to be effective in improving AB use (Harvey *et al.*, 2003). Moreover drug regulations that affect the availability of AB are implemented differently in different countries and can play an important role in misconceptions about the use of AB (Grigoryan *et al.*, 2007).

About 20% of participants used alternative AB, about 33% was recommended by physician and only 11% was subjected to lab investigation before shifted to alternative AB. However 44% of participants use AB for cold or running nose, this is quite high value compared with other study conducted in Abu Dhabi (Abobakr *et al.*, 2009) and Sweden (Malin *et al.*, 2010). AB has no effect as confirmed by other study ( Taylor & Leithman, 2002) found that half adult believe AB are somewhat effective in treating colds and flu although the majority knows that colds and flues are caused by viruses, not bacteria, and most people know that AB are not effective in viruses (McNulty *et al.*, 2007). Agumentin and amoxicillin were mostly used in concordance with other reported results (Abobakr *et al.*, 2009) (Awad *et al.*, 2005), (Andrajati *et al.*, 2005), (Saradamma *et al.*, 2000). More than one third of participants have miss understanding that AB therapy stopped when symptoms are relieved. This is due to poor awareness of participants towards AB therapy adherence regarding continuation of the whole course of AB even with the relieve of clinical disorder symptoms and they should not use another AB without physician

advise, and physician should send the patient for lab investigation before prescribing alternative AB as its reported that more than 40% of about 50 million prescriptions for AB written each year in physicians' offices are inappropriate (Rabin, 2003). Using AB when not needed can lead to the development of deadly strains of bacteria that are resistant to drugs and cause more than 88000 deaths due to hospital-acquired infections (Weinstein *et al.*, 1998). Results shows that people awareness about complication associated with AB abuse is poor and more than 50% of participants consider AB use is as safe as OTC medication. Education of people in UAE about the complication associated with AB misuse is required by different health authorities. Most major resistance control strategies recommend education for the general public to promote appropriate AB use (Finch *et al.*, 2004; Ranji *et al.*, 2008). In UAE AB use regulation is recommended with prescription as in European countries.

## CONCLUSION

In conclusion the study showed low awareness of the population about antibiotic therapy adherence and poor knowledge about complication associated with antibiotic abuse. So it is imperative that the authorities take up mass education program which would go a long way in the prevention and management of antibiotic resistance.

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