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RESEARCH ARTICLE

SELF-MEDICATION PATTERN OF ANTIBIOTICS AMONG THE PEOPLE OF IMPHAL WEST DISTRICT OF MANIPUR, INDIA

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Abstract

Background and aim: Self-medication with antibiotics is one of the growing issues in developing countries. Irrational use of antibiotics leads to development of resistance. Antibiotic resistance is a growing threat in management of infectious disease which leads to morbidity and mortality. Our study is to assess the self-medication pattern of antibiotic among the people of Imphal West district of Manipur.

Materials and methods: A cross-sectional study was conducted on 1980 randomly selected people from populations of Manipur during September 2020. Data was collected using modified pre-structured questionnaire. Using SPSS software version 21, descriptive data analysis was done and expressed in frequencies and percentages. Result: In the study, female participants were more than male participants and majority were from the age group 18-30 years, educated and low-income group. Azithromycin was the most commonly used antibiotics followed by amoxicillin and clavulanic acid combination. Majority of them obtained the antibiotics from local pharmacies and was mainly recommended by the pharmacists. Only 16.92% of them faced mild adverse reaction. Around 65.04% of the participant considered that self-medication with antibiotics is not a safe practice.

Conclusion: This study showed that antibiotics were easily accessible and many people were not aware about the antibiotic usage and risk of developing its resistance in Imphal West. Higher authorities need to enlighten the public about the rational use of antibiotics and the dangerous effects of self-medication to overcome the antibiotic resistance.

Introduction:-

Self-medication is defined as the use of drugs to treat self-diagnosed disorders or symptoms or the intermittent or continued use of a prescribed drug for chronic or recurrent disease or symptoms.[1]Self-medication with antibiotics is one of the risingissuesin developing countries like India.[2]In India, without prescription antibiotic can be easily accessed.[3]Multiple factors are responsible for the rise of self-medication with antibiotic like wide advertisement, family members or friends influence,self-care, time factor, cost factor, lack of awareness and lack of healthcare facilities.[4,5]The practice of self-medication was also promoted by WHO for effective and rapid relief of symptoms

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to decrease the load of health care facilities which are often understaffed and unapproachable in rural and isolated areas.[6]But self-medication often happens in inappropriate way which in turn can leads to wastage of resources, increased chances of microbial resistance, adverse drug reaction and drug interactions.[7.8]

Drug resistance refers to unresponsiveness of a microorganism to an antimicrobial agent.[9] It is a growing threat in the management of infectious disease which often lead to treatment failure and greater risk of morbidity and mortality. It also increases the chances of contracting the resistant strain to the general population.[10]

WHO recommended a global action plan on antimicrobial resistance at World Health Assembly in May 2015. World Antimicrobial Awareness Week was held annually since then from 18-24 November.[11]

Besides the growing interest in self-medication research limited systemic study are available for self-medication with antibiotic in Manipur. So, the present study is conducted to assess the self-medication pattern of antibiotics among the people of Imphal west district of Manipur.

Materials and Methods:-

Study design and setting: A cross sectional study was conducted in 1980 randomly selected people from Imphal West district of Manipur from November 2020 to April 2021. The total population of Imphal West was 5.17 lakh.[12]

Sample size and sampling procedure: First the sample size for infinity population was calculated by using the formula $S=Z^2*P*(1-P)/M^2$ where S-sample size for infinite population,Z- Z score (1.96 as confidence interval assumed to be 95%), P- population proportion (assumed to be 50% = 0.5), M- margin of error (assumed to be 5%). So, sample size for infinite population was 384.16. Then adjusted sample size for 1lakh population was calculated by using the formula,S=(S)/1+[(S-1)/population]. So, adjusted sample size for 1lakh population was 383. And since the population of Manipur is around 5.17 lakh so the sample size was taken as 1980.[13]

Inclusion criteria:

All adults ≥18 years of age living in Imphal west district who were ever exposed to self-medication and in sound mind.

Exclusion criteria:

<18 years and not in sound mind Study questionnaire: A questionnaire was prepared by modifying a prestructured questionnaire.[14] The study questionnaire contained sociodemographic, attitude and knowledge-based question about self-medication practice. The participants were allowed to fill multiple options in questionnaire.

Data collection:Data were collected by using the modified prestructured questionnaire.[14] Before filling the data, participants were explained about the objectives of the study and how to fill the questionnaire. They were also explained about the definition of self-medication with antibiotic in our study as use or consumption of antibiotics without consulting adoctor in the past one year.Verbal consent was obtained and only those consented participants were allowed to fill the form. All the data obtained were entered in Microsoft Excel.

Statistical analysis: Data entered in the Microsoft Excel was analyzed usingSPSS software version 21.And descriptive data were expressed in frequencies and percentages.

Results:-

In this study, questionnaire of 1294 participants were analyzed out of 1980 participants and 686 questionnaires were excluded as they have not taken antibiotic in the past 1year. Self-medication with antibiotic was highest in the age group of 18-30 years i.e., 40.26% and female participants (52%) were more than male participants (47.99%). 46.67% were graduate, 27.04% were secondary school passed, 15.74% were post graduate, 7.8% were primary school passed, 1.85% were illiterate and 1.08% were doctorate degree and others like those who left education before high school passed. 33.23% were self-employed, 24.72% were unemployed, 23.33% were private employed and 18.70% were government employed.(Table1)

Among the participants, those who earned less than 10 thousand monthly were 56.36% which is more than half of the participant and 29.15% earned less than 29 thousand monthly, 9.9% earned between 29 to 49 thousand monthly and only 4.51% earned more than 50 thousand monthly. (Table1)

Table 1:- Sociodemographic data and frequency of antibiotic taken in the last one year.

Age(years)	**Frequency (n=1294)**	**Percentage**
18-30	521	40.26%
31-40	358	27.66%
41-50	156	12.05%
51-60	197	15.22%
>60	82	6.33%
Gender		
Male	621	47.99%
Female	673	52%
Qualification		
Primary school	101	7.80%
Secondary school	350	27.04%
Graduate	604	46.67%
Post graduate	201	15.74%
Illiterate	24	1.85%
Others	14	1.08%
Occupation		
Unemployed	320	24.72%
Government employed	242	18.70%
Self employed	430	33.23%
Private employed	302	23.33%
Monthlyincome(rupees in thousand)	**(n=974)**	
<10	549	56.36%
<29	284	29.15%
29-49	97	9.9%
≥50	44	4.51%
Antiobiotic taken in last one year	**(n=1294)**	
once	936	72.33%
2-3times	292	22.56%
4-5times	36	2.78%
>5times	30	2.31%

72.33% of the participants have self-medicated with antibiotic only once in the past one year, 22.56% have done 2-3 times, 2.78% have done 4-5 times and 2.31% have done it for more than 5times in the past one year. (Table1)

Table 2:- Name of the antibiotics used for self-medication.

Antibiotic name	**Frequency(n=1294)**	**Percentage**
Azithromycin	381	29.44%
Amoxicillin + clavulanic acid	292	22.56%
Ofloxacin + ornidazole	160	12.36%
Amoxicillin	153	11.82%
Doxycycline	71	5.48%
Cefixime	59	4.55%
Metronidazole	45	3.47%
Ciprofloxacin	27	2.08%
Levofloxacin	19	1.46%
Cefadroxil	18	1.39%
Norfloxacin	15	1.15%

Cefpodoxime	11	0.85%
Cephalexin	9	0.69%
Nitrofurantoin	9	0.69%
Erythromycin	8	0.61%
Clindamycin	5	0.38%
Cefaclor	4	0.30%
Penicillin	4	0.30%
Ampicillin	1	0.07%
Roxithromycin	1	0.07%
Cefuroxime	1	0.07%
Tetracycline	1	0.07%

Table 3:- Reason and symptoms for taking self-medication, source, selection of antibiotic and dose, reason for change in antibiotic and dose.

Reason for self-medication	**Frequency(n=1550)**	**Percentage**
Time saving	109	7.03%
Cost saving	734	47.35 %
Previous experience	641	41.35%
Doubt the doctor	26	1.67%
Others	40	2.58%
Symptoms	**(n=1887)**	
Fever	1040	55.11%
Cough	261	13.83%
Sore throat	150	7.94%
Runny nose	107	5.67%
Diarrhoea	235	12.45%
Vomiting	12	0.6%
Wound	52	2.7%
Others	30	1.5%
Selection of Antibiotic	**(n=1690)**	
Family/ friend opinion	404	23.90%
Recommendationby pharmacist	808	47.81%
Previous prescription	438	25.91%
Advertisement	8	0.47%
Others	32	1.89%
Source of antibiotic	**(n=1671)**	
Pharmacies	1434	85.81%
Leftover medicine	108	12.14%
Online	20	1.19%
Family/friends	93	5.56%
others	16	0.95%
Selection of dose	**(n=1518)**	
By checking the internet	35	2.30%
Past experience	440	28.98%
Pharmacist opinion	820	54.01%
Family/friends opinion	161	10.60%
Randomly	33	2.17%
Others	29	1.9%
Reason for change in dose	**(n=511)**	
Condition worsened	164	32.09%
Condition improved	323	62.20%
No enough drug	15	2.93%
others	9	1.76%
Reason for change in antibiotic	**(n=429)**	

New one cheaper	29	6.75%
Previous one ineffective	316	73.65%
Previous one got over	75	17.48%
Others	9	2.09%

The antibiotic which was most commonly used were Azithromycin (29.44%) followed by amoxycillin + clavulanic acid (22.56%) and others like ofloxacin and ornidazole combination, amoxicillin, doxycycline, cefixime, metronidazole, ciprofloxacin, ofloxacin, cefadroxil, norfloxacin, cefpodoxime, cephalexin, nitrofurantoin, erythromycin, clindamycin, cefaclor, penicillin, ampicillin, roxithromycin, cefuroxime and tetracycline. (Table2)

Self-medication was done mainly for saving the cost (47.35%), 41.35% did it because they have previous experience, 7.03% for saving time, 1.67% did it because they doubt the doctor and 2.58% did it for other reason like to avoid crowd in OPD, for covid prophylaxis and thought that it was minor symptoms. (Table3)

Symptoms for which self-medication with antibiotic was mainly done were fever (55.11%), cough (13.83%), diarrhoea (12.45%), sore throat (7.94%),runny nose(5.67%), wound (2.7%),vomiting(0.6%) and others (1.5%) like ear infection, skin infection and toothache.(Table3)

Antibiotic were selected mainly based on recommendation by pharmacist (47.81%) followed by previous prescription (25.91%), family or friends' opinion (23.90%), advertisement (0.47%) and others (1.89%) like internet and randomly.(Table3)

The main source of obtaining the antibiotic was pharmacy (85.81%), followed by leftover medicines (12.14%), family/friends (5.56%), online(1.19%) and others (0.95%) like neighbours. And dose was also selected mainly based on pharmacist opinion (54.01%) followed by past experience (28.98%), family or friends' opinion (10.60%), by checking the internet (2.30%), randomly (2.17%) and others (1.9%) like relatives. (Table3)

511(26.98%) have changed the dose of the antibiotic during the course of treatment and the main reason for changing the dose was improvement in condition of illness (62.20%) followed by condition worsened (32.09%), drug not enough for the course (2.93%) and others (1.76%) such as previous dose ineffective and intolerance to previous dose. (Table3)

393(20.75%) have changed the antibiotic into another antibiotic and the main reason for the change in antibiotic was previous antibiotic was not effective (73.65%),previous one got over (17.48%),newer one was cheaper (6.75%) and others (2.09%) such as new one was better drug, side effect with the previous drug. (Table3)

48.40% have stopped the antibiotic when symptom disappeared, 42.36% after completing the course of antibiotic, 5.36% after few days and 2.91% when the drug finished and others (0.67%) when forget to take the drug and when there is adverse reaction. (Table 4)

16.92% developed adverse reaction after self-medication and the most common adverse reaction was allergy 17.35% followed by nausea 14.15% and others like dizziness, diarrhoea, headache, stomachache, vomiting, weakness, burning stomach, loss of appetite, constipation and hair loss. (Table 4)

After the adverse reaction developed, 42.92% have stopped the antibiotic, 19.17% consulted doctor, 18.26% consulted pharmacist, 17.80% converted to another antibiotic,1.82% were others like continued the courseand consulted friends/family. (Table 4)

394(30.44%) agreed that self-medication with antibiotic is a safe practice while 68(5.25%) strongly agreed and 832(64.29%) disagree. (Table 4) And 39.91% stated that they will continue self-medication practice in the future.

Table 4:- When antibiotic was stopped, adverse reaction, action taken for adverse reaction and belief towards self-medication.

Stop antibiotic	**Frequency (n=1463)**	**Percentage**

When symptoms disappear	713	48.40%
After completing the course of antibiotic	624	42.36%
When drug finished	43	2.91%
After few days no matter what the outcome was	83	5.36%
Others	10	0.67%
Adverse reaction	**(n=219)**	
Allergy	38	17.35%
Nausea	31	14.15%
Dizziness	25	11.41%
Diarrhoea	22	10.04%
Headache	22	10.04%
Stomachache	19	8.67%
Burning stomach	17	7.76%
Weakness	15	6.84%
Vomiting	15	6.84%
Loss of appetite	11	5.02%
Constipation	3	1.36%
Hairloss	1	0.45%
Action taken for the adverse reaction	**(n=219)**	
Stopped the medication	94	42.92%
Doctor's opinion	42	19.17%
Pharmacist opinion	40	18.26%
Converted to another antibiotic	39	17.80%
Others	4	1.82%
Self-medication is a safe practice	**(n=1294)**	**Percentage**
Agree	394	30.44%
Strongly agree	68	5.25%
Disagree	832	64.29%

Discussion:-

This study was the first of its kind to the best extent of our knowledge examining the pattern of self-medication with antibiotic in Imphal west district of Manipur.According to this study, the prevalence of antibiotic self‑medication practice was 65.3%. This rate was quite similar to that of thestudy done by Abhobakar AA et al.[10]In the current study, 18 - 30 years old was mainly involved and the lowest was those aged more than 61 years old. Similar results were seen in the study conducted by Ying TJ et al[15] but the study by Aragoness JM et al[16] showed that the aged group of 43-53 years old was more common.Female participantshad more antibiotic self‑medication thenmale.Thisfinding was consistentwith the study conducted by Raul Raz MD et al.[17]However, the study conducted by Rajendra A et al[18]showed that male participantswere more than female participants. Self-medication was mainly among the graduated people (46.67%) and the uneducated people showed only 1.85% of the response rate.Majority were the participants with the least monthly income i.e., less than 10 thousand and self-employed.

Frequency of self-medication with antibiotic was mainly once a year (72.33%).Among the self-medicated antibiotic in this study, Azithromycin was the most common followed by Amoxicillin + Clavulanic acid combination. However, a study by Khalid MG el al[19] done in some other place reported that Amoxycillin is the most common followed by Amoxicillin + Clavulanic combination among the self-medicated antibiotic.

The most common symptoms for which majority have taken antibiotic was fever followed by diarrhoea, cough, sore throat and others while the study conducted by Aparna R et al[20] showed that the most common symptom was sore throat followed by fever, cough, running nose and others.

Cost was the main reason for self-medication with antibiotic. This might be due to the high cost of doctor's fee and as majority of the participants were from the least income group.Themain source of information for selecting the antibiotic was pharmacistand it was mainly obtained from the pharmacy which was consistent with the study conducted by Bilal M et al.[21]Selection of dosage was also done based on pharmacist opinion. This shows that antibioticswere easily accessible in the pharmacy without prescription and laws relating to sales of drugs were not properly employed.

Around 62.20% have changed the dose of the antibiotic during the course of self-medication because the condition of the illness improved and around 73.65% changed the antibiotic to another one because the previous one was not effective. And almost half of the participants (48.40%) stopped the antibiotic when symptoms disappear.In a study conducted by SharmaK et al[2]similar reason was reported for the change in the antibiotic during the course of self-medication and for stopping the antibiotic.However, in another study conducted by Kumar R et al[22]at different place showed that the no of participants who took complete course of the antibiotic was 66.9%. Our study shows that majority used the antibiotics in inappropriate way which may leads to harm rather than the benefits likeincreased risk of antibiotic resistance.

When asked about the adverse reaction only around half of the participant i.e., 52.08% was aware of it. Around 16.92% developed adverse reaction and the most common adverse reaction was allergy (17.35%) followed by nausea, dizziness, diarrhoea, headache and others. A study done by Bilal M et al[21] also reported that very few people was aware of the adverse reaction and the most common adverse reaction was diarrhoea/abdominal pain followed by allergy and sleep disturbances.

On assessment it was found that, 5.25% of the participant strongly agreed that self-medication is a safe practicewhile 64.29% disagreed. And 39.9% considered that they will continue this practice in the future.

Limitation:
the self-medication pattern of antibiotic for the whole state of Manipur cannot be reflected by this study as it contains only one district of the state. There might be recall bias as the study was conducted based on information recollected by the participants on the usage of antibiotic in last one year. And as the study was conducted during the Covid pandemic period the actual prevalence rate might be lower than the prevalence rate of our study.

Conclusion:-

This study shows that the prevalence rate of self-medication with antibiotic is more among the age group of 18-30 years,educated, female participants and low incomed group. Many are not aware about the dosing schedule and adverse reaction and obtained the antibiotic as recommended by pharmacist from pharmacy. So, pharmacist should be made aware about the medicolegal aspects of issues related to antibiotic self-medication. They should be encouraged to stop giving recommendation and sales of antibiotic without proper prescription. Our study also showed that many of them have stopped the antibiotic when symptoms disappearedand also changed the antibiotic and its dosage during the course of treatment. This showed that antibiotics are easily accessible and people are not aware about the antibiotic usage and risk of developing resistance. This highlights the crucial need of educating the general public about the side effect and risk associated with antibiotic use. Public awareness can be made by conducting advertisement in social media, newspaper etc. And lawsrelating to provision of antibiotic should be made stricter.

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