

**INAPPROPRIATE USE OF ANTIBIOTICS IN MANAGEMENT OF DIARRHEA AND
COUGH IN CHILDREN UP TO 5 YEARS OF AGE IN PRIMARY HEALTHCARE
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ABSTRACT

This study is conducted to find out the prescription practices of different broad spectrum antibiotics, being routinely prescribed to children between 2 to 59 months, suffering from cough and diarrhea, in different health facilities of South Punjab districts of Pakistan. A structured questionnaire is provided in various primary health facilities to medical officers, inquiring about details of cough and diarrhea cases visiting these facilities during time period March 2019 to May 2019. The compiled data of 360 children with cough and diarrhea is analyzed using SPSS (20). Descriptive statistics of cough and diarrhea in the given time along with associated symptoms and antibiotics being prescribed are shown in the form of tables and charts. Study infers that the antibiotics prescription rate is significantly high (around 80%) among children between 2-59 months visiting different health facilities for cough and diarrhea. This high rate could be dangerous for young generations in future, therefore, important measures like repeated training sessions for working staff in hospitals, community sessions with media involvement for community awareness, and promotion of related research work are highly recommended to halt the rapid expansion of resistance among young ones caused by these antibiotics.

KEYWORDS: Antibiotics, Cough and Diarrhea, South Punjab Primary Health Facilities.**INTRODUCTION**

The expansion in resistance of numerous pathogens to right now accessible antibiotics has been perceived as perilous. The progress in development of antibiotics resistance can be maintained a strategic distance from by judicious endorsing behavior towards antibiotics. Rational use of antibiotics infers recommending the suitable medication at the perfect time at the privilege dose, with this all accessible at a reasonable cost to the general population.^[1] Irrational use incorporates utilization of antibiotics for non-bacterial ailment, non-adherence to prescribed regimens and utilization of formulations that are costly or with more side effects; hence forestalling wanted therapeutic outcomes from being accomplished, potentially expanding antimicrobial resistance and increasing morbidity and mortality.^[2] The World Health Organization gauges that universally more than half of all medications are prescribed, dispensed or sold inappropriately and that half of all patients neglect to take them accurately. Failure to use correctly may appear as under use, overuse and abuse of prescribed or non-professionally prescribed medicines.^[2]

According to WHO report, irrational use of antibiotics in developing countries is up to 50% of all viral upper respiratory tract infections and viral diarrhea cases.^[3]

The degree of incorrect use of antibiotics in Pakistan is not surely known with just a couple of studies available, all of which led on review data obtained from medicine record from different hospital pharmacies.^[4,5]

In developing countries 50% of all diarrheal cases are caused by rotavirus.^[6] children between 6-11 months suffer about 4.8 episodes of these viral diarrhea attacks during their first year of life in developing countries.^[7] In Pakistan, 53300 children ages between 0-5 years die of diarrhea per year.^[8] The major cause of deaths in diarrhea cases is recognized as dehydration. And severity of dehydration can help about knowing the severity and prognosis of child's illness.^[9] Hence, antibiotics has no major role in treatment of viral diarrhea.

The antibiotic prescription rates for colds, URIs, and bronchitis account for a large portion of "unnecessary" antibiotic prescriptions, since these conditions have a

predominantly viral etiology and antibiotic treatment of them has not been shown to have a major clinical impact.^[10]

Due to less laboratory services and patient overload use of treatment guidelines based on clinical presentation is common in developing countries including Pakistan. In Pakistan guidelines being used for cough and diarrhea management are World Health Organization pocket book of hospital care for children guidelines for the management of common illnesses with limited resources (WHO), and the Integrated Management of Childhood Illnesses (IMCI).^[10,11] These guidelines have similar recommendations for the management of cough and diarrhea. In the management of diarrhea, all three guidelines recommend use of Oral Rehydration Solution (ORS) and zinc supplements for acute watery diarrhea (AWD); antibiotics are recommended for management of chronic diarrhea and dysentery (Includes cotrimoxazole, metronidazole, ceftriaxone and ciprofloxacin). Guidelines classify pneumonia into four categories, namely: no pneumonia (cough/cold), pneumonia, severe pneumonia and very severe pneumonia. This classification is based on the clinical presentation only. Antibiotics are indicated in the management of pneumonia (cotrimoxazole, amoxicillin) and severe pneumonia (ampicillin and gentamycin).

In this study, an analysis of antibiotics prescription rates for cough and diarrhea cases by general practitioners and medical officers in primary health setups has been offered. It also provides estimates of the amount of excess use of antibiotics for cough and diarrhea management, using more current prescribing data.

METHODOLOGY

Study Design, Clinical Settings, Study Population

The cross-sectional, descriptive study design is used to assess antibiotics prescribing rates in management of the cases of cough and diarrhea in children presented to primary health facilities of south Punjab, Pakistan. These primary health facilities include basic health units and

Diagnosis

Description	Frequency	Percent
Cough	200	55.6
Diarrhea	143	39.7
Both	17	4.7

Sample size used in this study is 360 children visiting different primary health facilities of different areas of south Punjab, Pakistan among these 360 children, 200 (55.6%) were suffering from cough, 143 (39.7%) from diarrhea and 17(4.7%) with both cough and diarrhea.

rural health centers along-with 2 private clinics run by registered medical officers in different areas of south Punjab. The sample size used is 360 children who attended these primary health facilities during the study period and fulfilled inclusion criteria. Children between 2-59 months suffering from cough and diarrhea are considered in study during the time period March 2019 to May 2019. Most of the children are from rural areas (80%). Few cases are not included in study due to incomplete data available. Children suffering from both cough and diarrhea are also considered in this study.

Data collection

Following informed consent data is collected using structured questionnaire. Information inquired is about age, sex, residence, presence of cough or diarrhea, duration of symptoms, consistency of stool, association with fever, presence or absence of sputum in cough, presence or absence of mucus/blood/pus in stool, presence of dehydration, stridor, any general danger sign, comorbidity etc. Children are physically examined properly for vital signs, chest-indrawings, coarse crackles in chest, signs of dehydration and any danger sign to ensure the validity and reliability of this study. Information regarding medicines prescribed from both internal and external pharmacies, duration and dosage of medicines is collected.

Statistical analysis

Collected data is compiled on excel sheet and coded using SPSS (20.0). Frequency of different presenting symptoms, antibiotics, and other medicines prescribed are analyzed and presented in the form of tables and charts.

RESULTS AND DISCUSSION

According to WHO, 50% of global antibiotics use is inappropriate.^[13] Appropriate antibiotics use in hospitals entails finding a way between their intense ability to lessen morbidity with infections and their potential dangerous impacts.

Cough

Description	Frequency	Percent
Present	217	-
Associated e Fever	83	38.24
With Sputum	63	29.03
Chest indrawings and Raised rr	30	13.82
No Association	41	18.89

Among 200 children suffering from cough only and 17 suffering from both cough and diarrhea, different diagnosis like common cold, pneumonia, and severe pneumonia are maintained. Association with fever in 83 children (38.24%), with sputum in 63 children (29.03%), with chest in-drawings and raised respiratory rate in 30 children (13.82%) is found. Remaining 41 children (18.89%) has no associated symptom. 60% children were diagnosed as suffering from common cold. 30% from

pneumonia, 3% from severe pneumonia and 7% from both cough and diarrhea according to WHO guidelines^[11] and IMNCI guidelines.^[12] Antibiotics prescribed in cough cases has been summarized as Amoxicillin(69%), cotrimoxazole(13%) and cefixime (2%). Cough syrup along with nebulization with vintoline alone was considered helpful in 16% of children. Cough syrup with paracetamol and amoxicillin are used in 13% of children.

Diarrhea

Description	Frequency	Percent
Present	160	-
Associated e Fever	29	18.12
Mucus/ Blood/ Puss	14	11.25
Dehydration	23	14.37
Persistent Diarrhea	2	1.25
None	89	55.62
Mucus/ Blood/ Puss and Dehydration	2	1.25
Associated e Fever and Mucus/ Blood/ Puss	1	0.6

Among 143 children suffering from diarrhea and 17 suffering from both cough and diarrhea; total 160 children; classes diagnosed include acute watery diarrhea, diarrhea with some dehydration /diarrhea with severe dehydration, dysentery & persistent diarrhea. Associations discussed include presence of fever in 29 children (18.12%), mucus/blood/pus in stool in 18 children (11.25%), dehydration in 25 children (15.62%) and no associated feature was found in 89

children(55.01%). Diarrhea persistent for more than 2 weeks diagnosed in 2 children only during this duration of study. ORS + zinc were given in 93.75% of cases in total. Flagyl in 20%, Cotrimoxazole in 3.12%, ciprofloxacin in 20.65% syrup paracetamol in 1.87% of diarrhea cases. Majority of children were given oral medicine. Only few children with severe dehydration needed intravenous fluids & medicines.

Presence of any General Danger Sign

Description	Frequency	Percent
Vomits Everything	6	1.7
Unconscious or Lethargic	5	1.4
Unable to drink or breastfeed	3	0.8
None	346	96.1

Referred to some other health facility

Description	Frequency	Percent
yes	7	1.9
No	353	98.1

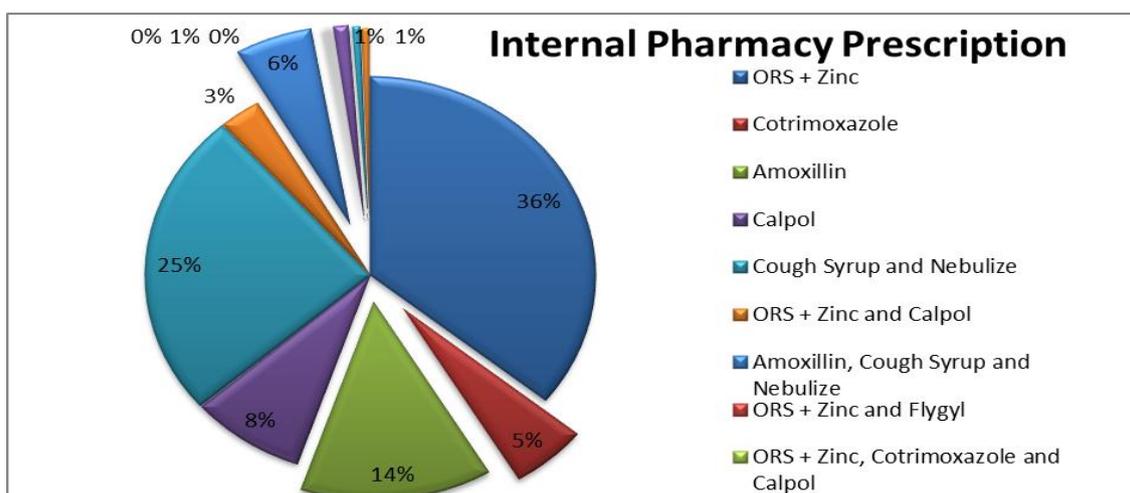
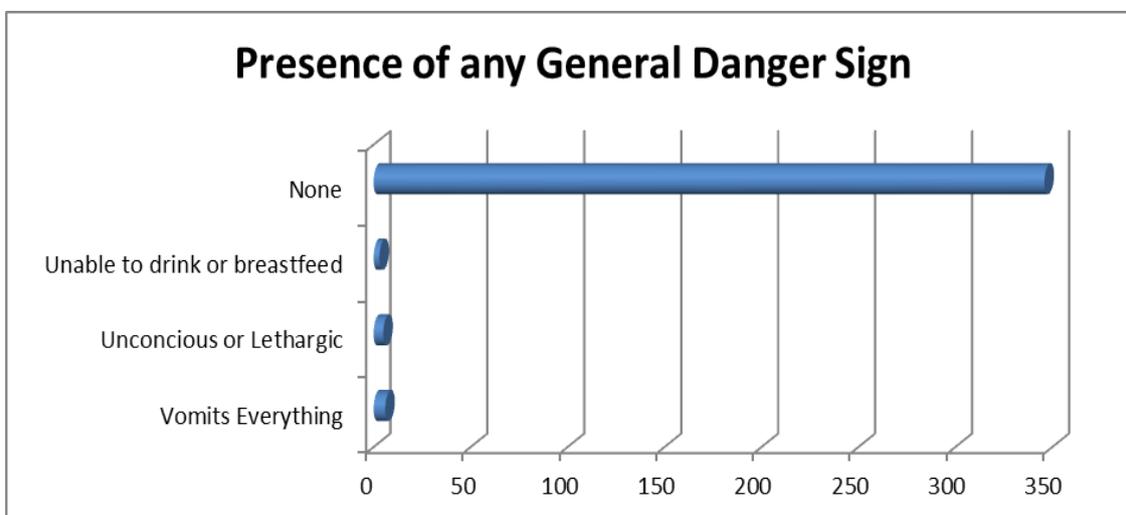
From the general danger signs being observed in severely sick children with cough and diarrhea visiting primary health facilities 6 children are found to vomit everything, 5 were found unconscious or lethargic, 3 are unable to drink or breastfeed and 2 presented with stridor

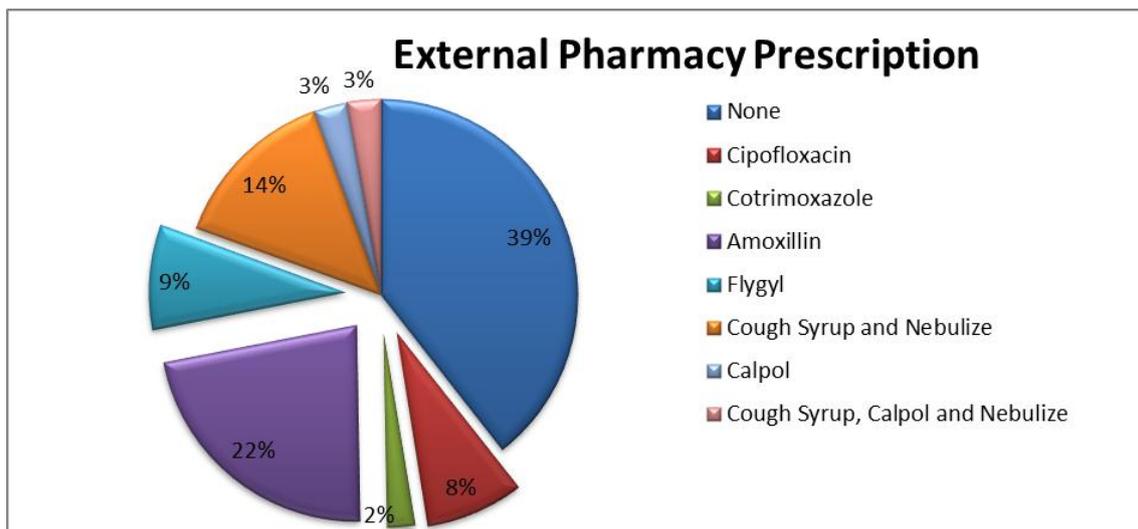
along-with severe chest in-drawings. From these severely sick children only 7 children are referred to higher facilities for management. Remaining 9 children are either treated at primary level or in some other private setup.

Medicine Prescribed from Internal Pharmacy			Medicine Prescribed from External Pharmacy		
Description	Frequency	Percent	Description	Frequency	Percent
ORS + Zinc	129	35.8	None	142	39.4
Cotrimoxazole	20	5.6	Ciprofloxacin	29	8.1
Amoxillin	50	13.9	Cotrimoxazole	8	2.2
Calpol	30	8.3	Amoxillin	80	22.2
Cough Syrup and Nebulize	90	25	Flygyl	31	8.6
ORS + Zinc and Calpol	11	3.1	Cough Syrup and Nebulize	50	13.9
Amoxillin, Cough Syrup and Nebulize	20	5.6	Calpol	10	2.8
ORS + Zinc and Flygyl	1	0.3	Cough Syrup, Calpol and Nebulize	10	2.8
ORS + Zinc, Cotrimoxazole and Calpol	1	0.3			
ORS+Zinc and Cotrimoxazole	4	1.1			

While making comparison between medicines made available to patients from internal pharmacies of different primary health centre and medicines prescribed from external pharmacies by various medical officers in different health centre of south Punjab, it is important to consider the socio-economic and demographic situation of patients visiting these primary health facilities. As most of these health facilities are working in far rural areas and population visiting these health facilities is low-income especially in low or middle income countries like Pakistan. Therefore, most of the patients'

prescriptions are being written according to availability of medicines in internal pharmacies run by government for free of cost medicines. Analyzing the data collected, it has been observed that antibiotics prescribing rates are higher from external pharmacies than from internal pharmacies. Also observed, that antibiotic prescribing practice is more common in private hospitals serving in different areas. Moreover, due to poor hygienic conditions in rural areas antibiotics are also prescribed as precautionary measure in viral infections to avoid super-infection or co-infection by bacteria.





The above comparative figures shows the wilderment situation of using antibiotics suggested from internal pharmacy and even more from external pharmacy, to the children who do not exhibit any danger sign. Interestingly and unfortunately, the non adjacent triangles expose that while suggesting the medicine (to the non showing danger sign children) from external pharmacy the medical officers feel more liberated to suggest an appropriate prescription, and they suggest even more of antibiotics then they do from internal pharmacy (where they have limited quantity of medicines to suggest), that means they take antibiotics as the most appropriate prescription to the little children. Having said, this data demonstrate only the Government medical officers, what will be the situation of private practitioners, which should not be known. This is indeed complex and disastrous which has to be addressed at earliest.

The study discusses that maximum number of prescriptions were inappropriate as most of the antibiotics used with in-correct duration, dosage or were not recommended in presented child's illness for example common cold, watery diarrhea etc as per World Health Organization guidelines and IMNCI program guidelines used in Pakistan. Excessive use, incorrect dosage, short duration, use of broad-spectrum antibiotics and utilization of more established older antibiotics can prompt increased resistance, mortality and increase treatment cost. 80% of the children with common cold were given antibiotics and 30% of the children with acute watery diarrhea were given antibiotics; although most of acute watery diarrhea and common cold cases are caused by viral infection and antibiotics have no role.^[6]

This study reports are consistent with reports from other low income or poor socioeconomic countries like Ethiopia where antibiotics prescription rate is over 86%^[14] in Tanzania around 80%^[15], and in vietnam drug use among children under 5 years with acute respiratory illness or diarrhea.^[16]

CONCLUSION AND RECOMMENDATIONS

Antibiotics prescription rate is significantly high (around 80%) in the management of cough and diarrhea among children under 5 years of age with majority suffering from viral illness. These high rates are driving this young population towards increased resistance and mortality leading to increased treatment cost, progressive health issues and social issues.

To halt this dangerous situation from expanding, proper training sessions of staff working in primary health facilities must be considered important. The availability of non-prescription antibiotics from external pharmacies must be taken into account by using electronic audits to control use of unauthorized reserve items and excessive use of watch list.^[17] Moreover, further research to explore driving factors of inappropriate use of antibiotics and awareness of population through community sessions, distribution of brochures and media involvement to explain the dangerous effects of excessive antibiotics use is highly recommended.

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