

A baseline survey on Prescribing Indicator In Pediatrics
&
Prescribing pattern of Acute Respiratory Infection(ARI)
in before child at Shishu Hospital in Dhaka

The thesis entitled “**A baseline survey on Prescribing Indicator In Pediatrics & Prescribing pattern of Acute Respiratory Infection(ARI) in before child at Shishu Hospital in Dhaka**” submitted to the Department of Pharmacy, East West University in the partial fulfillment of the requirement for the award of the degree of Master's degree of Pharmacy.

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EAST WEST UNIVERSITY

**In The Name of Allah (SWT)
the Most Merciful, the Most Beneficent.**

Dedication

This Paper Is Dedicated To

*My Parents, Brother, Sister
And Friends*

Declaration by the Research candidate

I, Md. Famidur Rahman, hereby declare that the dissertation entitled “**A baseline survey on Prescribing Indicator In Pediatrics & Prescribing pattern of Acute Respiratory Infection(ARI) in before child at Shishu Hospital in Dhaka**”, submitted by me to the Department of Pharmacy, East West University, in the partial fulfillment of the requirement for the award of the degree of Masters of Pharmacy in Clinical Pharmacy and Molecular Pharmacology, is a genuine & authentic record of original research work carried out by me during 2016 under the supervision and guidance of Nazia Hoque, Senior Lecturer, Department of Pharmacy, East West University and it has not formed the basis for the award of any other Degree/Diploma/Fellowship or other similar title to any candidate of any University.

Place: Dhaka

Date:

Signature of Candidate
(Md. Famidur Rahman)

ID: 2014-3-79-033

Thesis Certificate

This is certify that the thesis entitled “**A baseline survey on Prescribing Indicator In Pediatrics & Prescribing pattern of Acute Respiratory Infection(ARI) in before child at Shishu Hospital in Dhaka**”, submitted by me to the Department of Pharmacy, East West University, and in the partial fulfillment of the requirement for the award of the degree of Master's of Pharmacy (M. Pharm) is a genuine & authentic record of original research work carried out by Md. Famidur Rahman (2014-3-79-033) during the period 2016 of his research in the Department of Pharmacy at East West University, under the supervision and guidance of me and the thesis has not formed the basis for the award of any other Degree/Diploma/Fellowship or other similar title to any candidate of any University.

Dhaka

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Abstracts

According to World Health Organization report, an estimation of 5.9 million children under the age of 5, died in 2015. More than half of these early child deaths are due to conditions that could be prevented or treated with access to simple, affordable interventions. Maximum 44 deaths per thousand lives were recorded in 2015 for Under-five mortality rate with 90 percent uncertainty interval. There were 28% cases Death occurs from pneumonia in postnatal period in 2013 in Bangladesh. Also 15 % cases Death occurs from Diarrheal diseases in postnatal period in 2013 in Bangladesh. Thus the survey was done on Drug use indicators on pediatrics patients at Out patients department of **Dhaka Shishu Hospital** to check whether they follow the guideline of WHO. Thus A cross-sectional descriptive study was conducted using both qualitative and quantitative tools to gather data on Pediatrics patients from OPD and checking parameters to the standard guideline set by WHO. In current study, we found a number of diseases in pediatrics patients. The percentages of occurrence of those diseases while observing total encounters are Diarrhea (15.72%), Acute Respiratory Infection(ARI) (29.76%), Mal-digestion, Anorexia with Helminthiasis (6.49%), Ear, Nose and Throat (10.90%), Peptic Ulcer, gastric disease and abdominal pain (2.73%), Skin Infection and allergies (10.27%), Fever& common cold (20.96%) and Miscellaneous (3.14%). On an average, 3.73 drugs were prescribed per prescription during study in May 2016. In this study 72.72% prescriptions were prescribed with antimicrobials. Only 0.93% drugs were prescribed under generic a name. 0 % prescriptions contained an injection which was satisfactory for pediatric patients from Out-patients department. Percentage of drugs prescribed from Essential Drug List was 55.50 %.95.52 % of prescription contain antibiotics. From this 95.52% of prescription which is 64 cases of encounter among 67 cases contains different types of antibiotics. Study shows that 13.43% of patients were treated with Amoxicillin, 32.83% were treated with Azithromycin, 10.45% were treated with Cefaclor, 7.46% were treated with Cephadrine, 5.97% were treated with Ciprofloxacin and Erythromycin separately, 14.93% were treated with Cefixime tri- hydrate, and Cefpodoxime proxetil, Moxifloxacin and Co-amoxiclav were given 1.49 % of encounter in separate manner. NSAID was given in 61.2% of encounter. Anti-histamines were prescribed in 55.2% of encounter. Mucolytic given in prescription was 11.94% and 10.45% were treated with Multivitamin. 0% percentages of prescription for Acute Respiratory Infection in before child age which compliance with Standard treatment guideline. The pattern of rational drug use at **Dhaka Shishu Hospital** at the Out- Patients department in Dhaka was not satisfactory at

all. Intervention is needed to improve prescribing behaviors of practitioners such as short problem based training course in pharmacotherapy and rational use focused workshops can improve prescription behavior and skills.

Keywords: uncertainty interval, pneumonia, postnatal period, cross-sectional descriptive study, NSAID and pharmacotherapy.

Chapter1:

Introduction

Introduction:

Pediatrics is the branch of medicine dealing with the development, diseases and disorders of children. Infancy and childhood is a period of rapid growth and development. The various organs, body systems and enzymes that handle drugs develop at different rates; hence, drug dosage, formulation, response to drugs and adverse reactions vary throughout childhood. Compared with adult medicine, drug use in children is not extensively researched and the range of licensed drugs in appropriate dosage forms is limited.

For the purpose of drug dosing, children over 12 years of age are often classified as adults. This is inappropriate because many 12 year olds have not been through puberty and have not reached adult height and weight. The International Committee on Harmonization (2001) has suggested that childhood be divided into the following age ranges for the purposes of clinical trials and licensing of medicines:

- Preterm newborn infant
- Term newborn infants (0–27 days)
- Infants and toddlers (28 days to 23 months)
- Children (2–11 years)
- Adolescents (12–16/18 years)

These age ranges are intended to reflect biological changes: the newborn (birth to 4 weeks) covers the climacteric changes after birth, 4 weeks to 2 years the early growth spurt, 2–11 years the gradual growth phase and 12–18 years puberty and the adolescent growth spurt to final adult height. Manufacturers of medicines and regulatory authorities are working towards standardizing the age groups quoted in each product's Summary of Product Characteristics.

(Walker, R., Whittlesea, C., 2012)

Child Health: Common prevalence in Pediatrics Diseases:

According to World Health Organization report, an estimation of 5.9 million children under the age of 5, died in 2015. More than half of these early child deaths are due to conditions that could be prevented or treated with access to simple, affordable interventions. Leading

causes of death in under-5 children are preterm birth complications, pneumonia, birth asphyxia, diarrhoea and malaria. About 45% of all child deaths are linked to malnutrition. Children in sub-Saharan Africa are more than 14 times more likely to die before the age of 5 than children in developed regions. (WHO, 2016)

Table 1: Leading causes of death in post-neonatal children: risk factors and response

Cause of death	Risk factors	Prevention	Treatment
Pneumonia, or other acute respiratory infections	Low birth weight	Vaccination	Appropriate care by a trained health provider Antibiotics Oxygen for severe illness
	Malnutrition	Adequate nutrition	
	Non-breastfed children	Exclusive breastfeeding	
	Overcrowded conditions	Reduction of household air pollution	
Childhood diarrhea	Non-breastfed children	Exclusive breastfeeding	Low-osmolarity oral rehydration salts (ORS)
	Unsafe drinking water and food	Safe water and food	
	Poor hygiene practices	Adequate sanitation and hygiene	Zinc supplements
	Malnutrition	Adequate nutrition	
		Vaccination	

Common Prevalence in Bangladesh & Pediatric Diseases:

In Bangladesh, births and deaths are seldom recorded, making basic health indices such as causes and rates of death difficult to know with any real degree of certainty. However, basic data available from the Bangladesh Bureau of Statistics and the Bangladesh Demographic and Health Survey shows a steady decline in the Infant Mortality Rate (IMR) and the Under-Five Mortality Rate (U5MR). Child survival in Bangladesh has improved significantly over the last two decades. In particular, under-five mortality has fallen by half, from 146 to 76 deaths per 1,000 live births during the last decade till 2002. (Rahman, A., et al, 2005)

According to WHO, In 2013 there were over 15 million recorded under five years of age. Maximum 44 deaths per thousand lives were recorded in 2015 for Under-five mortality rate with 90 percent uncertainty interval. There were 28% cases Death occurs from pneumonia in postnatal period in 2013 in Bangladesh. Also 15 % cases Death occurs from Diarrheal diseases in postnatal period in 2013 in Bangladesh. (Neonatal and Child Health Profile, 2013)

Due to large vulnerable number of population are from Child, it needs proper caring. The future generation with safe treatment and rational prescribing is crucial factors for those vulnerable populations who maintains and carry our civilization to next generation with better health.

For ensuring medicines safety and quality for treatment it needs have indicators or criteria by which we can measure the standard treatment and safety of prescribing to patients. Thus The WHO Conference of Experts on the Rational Use of Drugs, held in Nairobi on 25-29 November 1985, was an important turning-point. The International Network for the Rational Use of Drugs (INRUD) was established in 1989 to promote the rational use of drugs in developing countries. The network generated indicators in three main drug use areas; prescribing, patient care, and drug systems; 20 randomly selected facilities and 36 encounters in each area were the minimum required to have representative data. Eleven studies on the rational use of drugs have been undertaken since 1989. The first study using these indicators was conducted in Dhaka, Bangladesh, in 1991, in two rural health centers in the same district, and may not reflect the situation in the whole of the country. However since then there are lots of researches taking places about base line survey on Hospital to check for rational use of drug. (Guyon, A.B., et al, 1994)

The aim of the current survey was to check current treatment practices and whether practitioner follows the WHO guideline for Rational Use of Drug and its parameter to pediatrics. The prescribing parameters which covers the base line survey is as follows:

- a. The mean number of drugs prescribed per patient to check the poly pharmacy,
- b. Percentage of encounter with an antibiotic prescribed,
- c. Percentage of encounter with an injection prescribed,
- d. Percentage of drugs prescribed by generic name,
- e. Percentage of drugs prescribed by from essential drug lists,

Thus the survey was done on Drug use indicators on pediatrics patients at Out patients department of Dhaka Shishu Hospital to check whether they follow the guideline of WHO:

INRUD indicators to better Rational prescribing and safety use of medicine. Prescriptions were collected as the base for measuring those indicators.

WHO/INRUD drug use indicators for health facilities

The WHO/INRUD drug use indicators are intended to measure aspects of health provider behavior in primary health-care facilities in a reliable way, irrespective of who collects the data. The indicators provide information to health-care managers concerning medicine use, prescribing habits and important aspects of patient care. All the indicators have been extensively field-tested in many countries and found to be relevant, easily generated and measured, valid, consistent, reliable, representative, sensitive to change, understandable, and action oriented. Drug Therapeutic committee can use indicator studies to:

- **describe current treatment practices** to determine whether there are problems in medicine use, and which facilities or prescribers have problems. When an indicator study shows unacceptable results, the DTC can investigate the problem in more depth and then take action to improve these results.
- **Show trends over time:** through the repeated measurement of the indicators so providing a monitoring mechanism. Prescribers and facilities whose performance falls below a specific standard of quality can be targeted for more intensive supervision.
- **motivate health-care providers** and DTC members to improve and follow established health-care standards.
- **evaluate the impact of interventions** designed to change prescribing behavior by measuring indicators in control and intervention facilities before and after the intervention.

In addition to showing the WHO/INRUD indicators (which are basically designed for primary health-care facilities), particularly for in patients. These hospital indicators have not been field-tested and are not widely accepted as the WHO/INRUD ones are, and they cannot replace a drug use evaluation. Since most of these indicators do not relate diagnosis to disease, they cannot tell us exactly what proportion of people were treated correctly or the exact nature of the drug use problem; they can only indicate that there is a drug use problem. Furthermore, different disease patterns and prescriber type will greatly affect the indicators,

so analysis should be done by diagnosis or prescriber type if these vary between the facilities to be compared.

The number of prescribing encounters per facility and the number of facilities which should be examined will depend on the objective of the study and are described in detail elsewhere. If the objective of the study is to describe drug use problems in a sample of facilities that is representative of a majority, then at least 30 prescribing encounters in each of 20 facilities (a total of 600 prescribing encounters), should be examined. If fewer health facilities are examined, then more prescribing encounters should be examined. If the objective is to study prescribers in one facility, as may be the case for a hospital Drug Therapeutic committee, then at least 100 prescriptions should be obtained at the single facility or department; if there is more than one prescriber, 100 prescriptions for each individual prescriber should be obtained. (WHO, 2003)

Measuring Prescribing Indicators

The indicators of prescribing practices measure the performance of health care providers in several key dimensions related to the appropriate use of drugs. The indicators are based on the practices observed in a sample of clinical encounters taking place at outpatient health facilities for the treatment of acute or chronic illness. These encounters can be observed retrospectively, from data recorded in historical medical records, or they can be observed prospectively, from a group of patients attending the clinic on the day the data are collected. The core prescribing indicators do not require the collection of any information on signs and symptoms. Because the samples of clinical encounters cover a broad spectrum of health problems, the core prescribing indicators measure general prescribing tendencies within a given setting, independent of specific diagnoses. Admittedly, many critical questions in drug use have to do with whether health care providers follow appropriate diagnostic procedures and whether they select products and dosage schedules to fit underlying health problems. However, determining the quality of diagnosis and evaluating the adequacy of drug choices is a complex undertaking in practice, and beyond the scope of the core indicators. After a first drug use study with selected indicators has been carried out to determine overall prescribing performance, it will usually be necessary to undertake more health problem-specific investigations and make an assessment of the quality of diagnosis and treatment.

The data to measure the prescribing indicators can be recorded on forms. The *detailed prescriber indicator form* requires recording the names and amounts prescribed for each drug, from which the values for each prescribing indicator can later be entered. The form also allows other information on patients, prescribers and health problems to be recorded. The advantages of the detailed form are that data can be collected by persons with less sophisticated knowledge about drugs, and also that later follow-up health problem-specific or drug-specific analyses can be carried out on the same data. The ordinary *prescriber indicator form* requires that each indicator be entered directly by data collectors in the field. This assumes that data collectors know enough about drugs to evaluate the indicators. Its main advantage is that it allows immediate summaries of the indicators to be produced and discussed with staff from the health facility; its disadvantage is that fewer possibilities exist to later validate the data. The detailed form can be used for secondary analysis of specific diagnoses or drugs.

1. Average number of drugs per encounter

Purpose To measure the degree of polypharmacy.

Prerequisites Combination drugs are counted as one. Guidelines are needed on how to count certain ambiguous prescribing practices (e.g. some standardized sequential therapies).

Calculation Average, calculated by dividing the total number of different drug products prescribed, by the number of encounters surveyed. It is not relevant whether the patient actually received the drugs.

2. Percentage of drugs prescribed by generic name

Purpose To measure the tendency to prescribe by generic name.

Prerequisites Investigators must be able to observe the actual names used in the prescription rather than only having access to the names of the products dispensed, since these may be different; a list must be available of specific product names to be counted as generic drugs.

Calculation Percentage, calculated by dividing the number of drugs prescribed by generic name by the total number of drugs prescribed, multiplied by 100.

3. Percentage of encounters with an injection/Antibiotic prescribed

Purpose To measure the overall level of use of two important, but commonly overused and costly forms of drug therapy.

Prerequisites A list must be available of all the drug products which are to be counted as antibiotics; investigators must be instructed about which immunizations are not to be counted as injections.

Calculation Percentages, calculated by dividing the number of patient encounters during which an antibiotic or an injection are prescribed, by the total number of encounters surveyed, multiplied by 100.

4. Percentage of drugs prescribed from essential drugs list or formulary

Purpose To measure the degree to which practices conform to a national drug policy, as indicated by prescribing from the national essential drugs list or formulary for the type of facility surveyed.

Prerequisites Copies of a published national essential drugs list or local institutional formulary to which data on prescribed drugs can be compared; procedures are needed for determining whether or not brand name products are equivalent to ones appearing in generic form on the drug list or formulary.

Calculation Percentage, calculated by dividing the number of products prescribed which are listed on the essential drugs list or local formulary (or which are equivalent to drugs on the list) by the total number of products prescribed, multiplied by 100.

Required tasks for measuring prescribing indicators

All prescribing indicators are based on behavior observed in small samples of patient encounters which are collected retrospectively or prospectively from a group of health facilities. Therefore, the first two tasks for measuring any of the prescribing indicators are to select a group of health facilities and to define how the clinical encounters will be sampled at these facilities. Once the samples of facilities and encounters have been selected, specific types of data necessary to measure the indicators will be recorded for each encounter. In order to record these data in a consistent and reproducible way, certain other activities have to take place before the data collection can start. The sequence of activities for measuring the prescribing indicators in a standardized way is detailed below.

Define drugs to be regarded as antibiotics

Antimicrobial agents are not always classified in an identical way. Sometimes drugs such as antiprotozoals, antihelminthics or antituberculosis agents are placed in a separate category from other antibiotics, while other systems may classify all these products in a single category of anti-infectives or antimicrobials. The indicators of antibiotic use are quite sensitive to whether or not certain groups of drugs are included as antibiotics, especially in environments where problems such as parasitic infestation or tuberculosis are common. Another issue in the definition of antibiotics for drug use indicators is whether topical antibiotic preparations, such as skin creams and ophthalmic ointments, should be counted as antibiotics. In areas where trachoma, bacterial conjunctivitis or bacterial skin infections are common these products may be widely used. The name of antibiotics could be found from WHO essential drug list.

There are a number of common ambiguities addressed by this recommended list. Metronidazole, which could be considered as an antibiotic but is much more often used as an antiprotozoal, should in this context not be counted as an antibiotic. However, sulfa drugs are counted as antibiotics. Antibiotic eye ointments and skin creams, such as oxytetracycline or chloramphenicol, are counted as antibiotics under this system. Anti-diarrhoeal preparations that contain an antibiotic, the two most common being streptomycin or neomycin, are counted as antibiotics as well.

Define drugs to be classified as generic

To calculate the percentage of drugs prescribed by generic name, investigators need to have a list of drug names that are to be counted as generics. Without such a list it may be difficult to reliably classify some product names as generic or brand name. Usually the national essential drug list or local formulary will be written using generic names rather than brand names, so this list can often be used as the basis. Alternatively, the WHO Model List of Essential Drugs can be used as a starting point. (WHO, 1993)

Prescribing

To prescribe is to authorize by means of a written prescription the supply of a medicine. Prescribing incorporates the processes involved in decision making undertaken by the prescriber before the act of writing a prescription. Historically, prescribing has been the

preserve of those professionals with a medical, dental or veterinary training. As the role of other health care professionals such as pharmacists and nurses has expanded, prescribing rights have in turn been extended to them. The premise for this development has been that it better utilizes the training of these professional groups, is clinically appropriate and improves patient access. Regardless of the professional background of the individual prescriber, the factors that motivate them to prescribe a particular medicine are a complex mix of evidence of effectiveness and harm, external influences and cognitive biases.

A rational approach to prescribing uses evidence and has outcome goals and evaluates alternatives in partnership with the patient. With the advent of new professional groups of prescribers (non-medical prescribers), it is increasingly important to understand the components of rational and effective prescribing, and the influences on this process. There is a need for a systematic approach to prescribing, and an understanding of the factors that influence the decision to prescribe a medicine.

Rational and effective prescribing

Prescribing a medicine is one of the most common interventions in health care used to treat patients. Medicines have the potential to save lives and improve the quality of life, but they also have the potential to cause harm, which can sometimes be catastrophic. Therefore, prescribing of medicines needs to be rational and effective in order to maximize benefit and minimize harm. This is best done using a systematic process that puts the patient at the heart of the process.

What is meant by rational and effective prescribing?

There is no universally agreed definition of good prescribing. The WHO promotes the rational use of medicines, which requires that patients receive medications appropriate to their clinical needs, in doses that meet their own individual requirements, for an adequate period of time, and at the lowest cost to them and their community. The prescriber should have the following four aims:

- Maximise effectiveness
- Minimise risks
- Minimise costs
- Respect the patient's choices.

Inappropriate or irrational prescribing

Good prescribing is sometimes defined as the lack of irrational prescribing. Prescribing can be described as irrational for many reasons:

- Poor choice of a medicine
- Polypharmacy or co-prescribing of interacting medicine
- Prescribing for a self-limiting condition
- Continuing to prescribe for a longer period than necessary
- Prescribing too low a dose of a medicine
- Prescribing without taking account of the patient's wishes.

Inappropriate or irrational prescribing can result in serious morbidity and mortality, particularly when childhood infections or chronic diseases such as hypertension, diabetes, epilepsy and mental disorders are being treated. Inappropriate prescribing also represents a waste of resources and, as in the case of antimicrobials, may harm the health of the public by contributing to increased antimicrobial resistance. Finally, an over-willingness to prescribe stimulates inappropriate patient demand and fails to help the patient understand when they should seek out support from a health care professional. (Walker, R., Whittlesea, C., 2012)

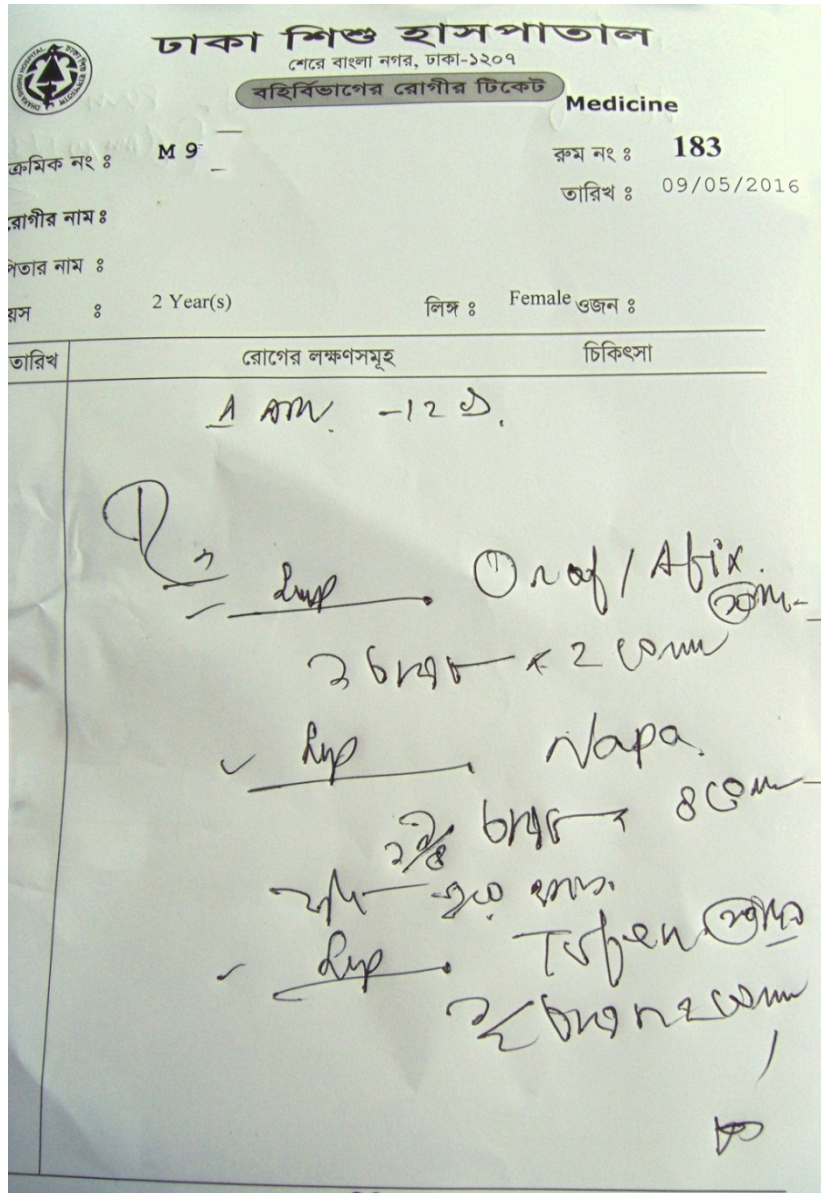


Fig 1: A model of Prescription during Survey

Standard Treatment Guideline:

Standard Treatment Guidelines (STG) is systematically developed statements that assist prescribers in deciding on appropriate treatments for specific clinical problems. They usually reflect the consensus on the optimal treatment options within a health system and aim at beneficially influencing prescribing behavior at all levels of care.

Health systems, particularly in developing countries, are faced with growing health needs on one hand and limited resources on the other. Policy makers at various levels are therefore engaged in designing cost-effective health interventions that ensure accessible and affordable quality care for all, in particular the poor and vulnerable groups. Inappropriate prescribing is

one of the manifestations of irrational medication use behavior. It occurs when medicines are not prescribed in accordance with guidelines that are based on scientific evidence to ensure safe, effective, and economic use. STGs provide the tool for health care providers to give quality standardized care at affordable cost.

Acute Respiratory Infection

Most children have about 4-6 acute respiratory infections each year. Children with respiratory infections account for a large proportion of patients seen by health workers in health centers. These infections tend to be even more frequent in urban communities than in rural areas. Respiratory infections are infections in any area of the respiratory tract, including the nose, middle ear, throat (pharynx), voice box (larynx), windpipe (trachea), air passages (bronchi or bronchioles), and lungs.

Many areas of the respiratory tract can be involved, and there can be a wide variety of signs and symptoms of infection. These include:

- cough;
- difficult breathing;
- sore throat;
- runny nose;
- ear problems.

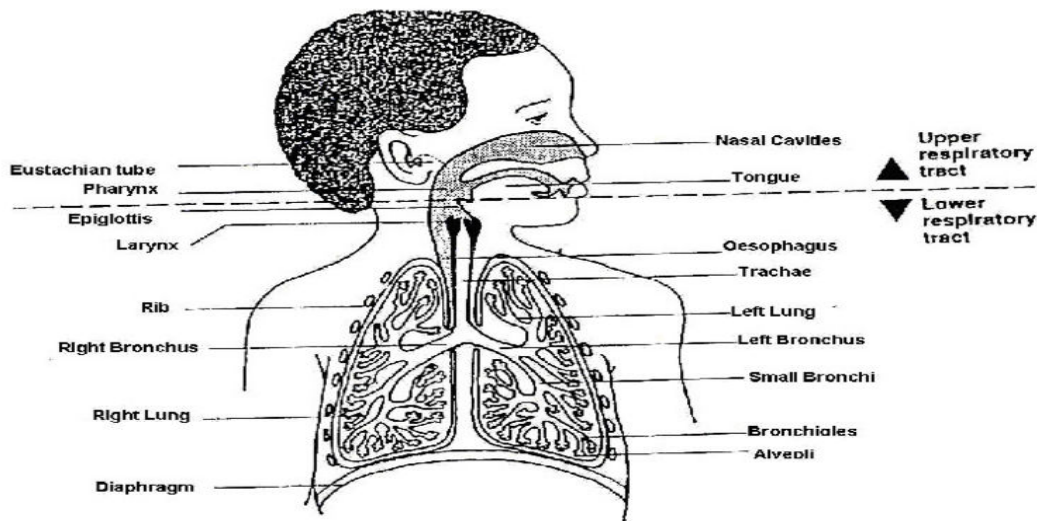


Fig 2: Respiratory Tract

Classification of Acute Respiratory Infection

The classification of ARIs can be done in several ways. A common method of classification of ARI is by site of infection. This method of classification distinguishes upper and lower acute respiratory tract infections.

1. The Acute Upper Respiratory Tract Infection (AURI) which include:
 - Cold,
 - Otitis media and
 - Pharyngitis

2. The Acute Lower Respiratory Infections (ALRI) which include:
 - Epiglottitis,
 - Laryngitis,
 - Laryngo tracheitis,
 - Bronchitis,
 - Bronchiolitis and
 - Pneumonia

Fever is also common in acute respiratory infections. Fortunately, most children with these respiratory symptoms have only a mild infection, such as a cold or bronchitis. They may cough because nasal discharge from a cold drips down the back of the throat, or because they have a viral infection of the bronchi (bronchitis). They are not seriously ill and can be treated at home by their families without antibiotics.

However, a few children have an acute infection of the lungs (pneumonia). If they are not treated with an antibiotic, these children may die, either from a lack of oxygen, or from a bacterial infection of the bloodstream (called sepsis or septicaemia). About one-quarter of all children less than 5 years of age who die in developing countries do so because of pneumonia. Pneumonia and diarrhea are the two most common causes of death in children. Many of the deaths from pneumonia occur in young infants less than 2 months of age.¹ therefore, treating children who have pneumonia can greatly reduce deaths in children. In order to treat these children, the health worker must be able to carry out the difficult task of

identifying the few, very sick children among the many children with respiratory infections that are not serious.

(Management of ARI in Children, 2015)

The management of acute respiratory infections in children:

The practical guideline for Acute Respiratory Infection by WHO are as follows:

For outpatients or community based care severe pneumonia, pneumonia, sore throat, wheezing bronchial asthma can be treated by Broad guideline for example:

- > Advise mother to give home care.
- > Give an antibiotic.
- > Treat fever, if present.
- > Treat wheezing, if present.
- > Advise mother return with child in 2 days for reassessment, or earlier if the child is getting worse.

WHO sets the guideline that Drugs must be given for ARI in Pediatrics would be as follows:

- a. Advise mother include Feeding the child, Increase fluids and Increase breastfeeding.
- b. Antibiotic: WHO recommends treating pneumonia or other respiratory infection by giving one of the following antibiotics for 5 days
 - co-trimoxazole,
 - amoxicillin,
 - ampicillin,
 - procaine penicillin as IM
- c. Fever Treatment: Paracetamol is given when fever is greater than 39°C.
- d. Treat wheezing: Using Oral Salbutamol as rapid acting Bronchodilators, Epinephrine Injection.

WHO recommends if above one of the antibiotics do not work then shifts the antibiotics and chose among them. In facility based care or In patients department WHO recommends if above antibiotic do not work then use ceftriaxone as 2nd line of treatment for ARI pediatrics. (Management of ARI in Children, 2015)

From this guideline we also check the compliance of STG guideline to the prescribers at OPD of Dhaka Shishu Hospital Dhaka.

Chapter 2:

LITERATURE REVIEW

Literature Review

Akbar, M. S., et al (1992) stated that In Bangladesh, Acute Respiratory Tract infection (ARI) alone is responsive 38.8% of total Paediatric hospital admission, 40% to 60% of total Paediatric OPD visit. (Akbar, M.S. et al, 1992)

Kafle KK., (1992) stated that 44% of drugs prescribed under generic name in a Nepal study. (Kafle KK., 1992)

Guyon, A.B., et al (1994) stated that the average consulting time (54 seconds), the proportion of adequate examinations (37%), and prescription of drugs according to standard treatment guidelines (41%). The mean number of drugs prescribed per patient was 1.44; 25% were treated with antibiotics, and 17% with metronidazole, irrespective of the diagnoses. The availability of drugs (54%) and the presence of an essential drugs list was 16%. However, 78% of the drugs were prescribed by their generic names, 85% complied with the essential drugs list, and 81% were dispensed according to prescription. The average dispensing time (23 seconds) and the proportion of patients who correctly understood the dosage (55%) were poor. (Guyon, A.B., et al, 1994)

Baqui, QBOF., Choudhury, SAR., (1996) reported that percentage of prescriptions with antimicrobials were 73.33oh and 6150% respectively. (Baqui, QBOF., Choudhury, SAR., 1996)

Rehana, HS., Nagrani, MA., (1998) their survey shows that the average number of drugs per prescription was 5.26. Eighty four percent of all prescriptions contained anti-microbial agent. (Rehana, HS., Nagrani, MA., 1998)

Ipp, M. D., (2000) reported that in a Kentucky study, 60 percent of patients were prescribed antibiotics for the common cold. (Ipp, M. D., 2000)

Choudhury, W. R., et al (2006) reported that 6.87% of drugs prescribed under generic name. (Choudhury W. R., et al, 2006)

Sarkar AP., Biswas S., Tripathi SK. (2007) also reported 38.2% of drugs prescribed under generic name In an Indian study. (Sarkar AP., Biswas S., Tripathi SK., 2007)

Kabir et al., (2009a) and Kabir et al., (2009b) also found that the two most common causes of ALRI in children below 2 years of age are bronchiolitis and community acquired pneumonia (CAP). (Kabir et al., 2009a; Kabir et al., 2009b)

Ashraf, H., Handa, S., Khan, NA., (2010) stated that the mean age of pediatric out patients was 3.85 years and male patients were 136 (61%) and female patients were 87 (39%). Majority of the pediatric patients were suffering from pneumonia 67 (30.18%) followed by diarrhea 30 (13.51 percent). A total of 882 drugs (including antibiotics) were prescribed to the total of 223 patients. 381 (43.19%) of drugs prescribed were antibiotics whereas the NSAIDS were only 126 (14.28%). Orally administered drugs contributed the highest proportion of drugs prescribed with 660 (75.28%) of total drugs. The average no. of drugs per prescription was 3.96 whereas average no. of antibiotics per prescription was 2.37. Cefotaxim was the leading antibiotic prescribed followed by Cefpodoxime. Cefadroxil was the highest antibiotic Prescribed in non - diagnosed patients. Combinations of antibiotics were prescribed to 75 (33.63%) patients. 87 out of 223 patients were prescribed the drugs up to Rs 40.00 per day. (Ashraf, H., Handa, S., Khan, NA., 2010)

Paul, PC., et al (2011) stated that the average number of drug per prescription was 3.24. Only 0.13% drugs prescribed under generic names. Around 36.83% of prescriptions were prescribed with antimicrobials and 7.08% prescriptions were contained injections. About 48.35 drugs were prescribed from essential list of drugs and vitamins were prescribed in 33.33% prescriptions. Their results revealed that there were apparent lacks of prescribing habit among the prescribers even in a teaching hospital. (Paul, PC., et al, 2011)

Haque, F., et al., (2012) found that the two most common causes of ALRI in children below 2 years of age are bronchiolitis and community acquired pneumonia (CAP). (Haque, F., et al., 2012)

Gupta, N. et al (2013) stated that The major diseases found during this study were Respiratory Tract Infections (35.62%), both Upper 21.92% (sinusitis, tonsillitis and rhinitis) and Lower 13.70% {bronchitis(8.90%), bronchial asthma(2.74%), pneumonia(1.37%), and tuberculosis(1.37%)} along with some skin diseases(12.33%) like diaper dermatitis, pyogenic granuloma, seborrheic & intertriginous dermatitis, eczema, and others like leishmaniasis, gastroenteritis, & parotitis. (Gupta, N. et al, 2013)

Gupta, N. et al (2013) also found from survey that average number of drugs used per patient was 3 ± 1 , and antibiotics were used most frequently than others. Prescription pattern of the drugs was like Analgesics and Antipyretics 97.56%, Antibiotics 93.55% (out of which 29.41% were prescribed two antibiotics), Nasal decongestants 23.54%, Anti-histaminic 19.73%, Multi vitamins and iron supplement 16.21%, Expectorants and bronchodilators 8.89%, Germicidal & disinfectant 8.01%, Anti-diarrhoeal 4.69%, Antispasmodic 4.49%, Corticosteroids 3.13%, Gastric acid suppressants 3.03%, Anti-emetics 1.95%, Anti-asthmatics 1.37%, Anti-helmentics 0.88%, and Anti-malarial 0.29% of prescriptions. (Gupta, N. et al, 2013)

Hemal, H., (2013) stated while researching on Dhaka shishu Hospital revealed that cephalosporin alone or in combination with an aminoglycosides was most common antibiotics which were prescribed for the treatment of children suffering from pneumonia. But surprisingly this given treatment had very insignificant (7.98%) adherence with the essential drug list (EDL) of Bangladesh. Thus he advised that Essential drug list should be updated. And also this study indicated that in 75.2% cases there is a practice of poly-pharmacy in Bangladesh. (Hemal, H., 2013)

Luthful, K.ARM. et al (2014) stated that from forty three Hospital the results was among a total of 5157 surveyed children 3484 (67%) had respiratory problems. Common cold, bronchiolitis, pneumonia, and asthma diagnosed by the trained research clinicians were 1659 (48%), 744 (21%), 402 (11.5%), and 277 (8%) respectively. The sensitivity and specificity of bronchiolitis, pneumonia, and asthma diagnosed by the local doctors were 15% and 99%, pneumonia 73% and 90% and asthma 10% and 100% respectively. The use of oxygen, salbutamol nebulisation, oral antibiotics, parenteral antibiotics, antihistamine, oral bronchiodilator and oral paracetamol prescribed by the doctors was 10%, 15%, 79%, 16%, 38%, 58%, and 42% respectively were for the management of the children with respiratory problems. (Luthful, K. ARM et al, 2014)

Luthful, K. ARM., et al (2014) found that In common cold, 654/1659 (39%) cases were treated with cotromoxazole, followed by amoxicillin (256, 15%), azithromycin (186, 11%), cefradine (108, 6.5%), ceftriaxone (106, 6%) and erythromycin (69, 4%). Cotrimoxazole was mostly (236/325, 69%) used in UZ health complex. In bronchiolitis, 267/744 (36%) children

received ceftriaxone followed by cotrimoxazole (122, 16%), amoxicillin (112, 15%), azithromycin (40, 5%) and cefradine (35, 5%). Cotrimoxazole was the most common antibiotic (51, 42%) used in UZ health complex. Ceftriaxone was mostly used in district medical college hospitals (156/267, 58 %) followed by district hospital (84, 31%). Asthma was treated mostly with cotrimoxazole (69/277, 25%), followed by azithromycin (65, 23%), ceftriaxone (53, 19%), and amoxicillin (41, 15%). Cotrimoxazole was the most common antibiotic in upazilla hospitals (35, 51%). Pneumonia was treated mostly with ceftriaxone (191,47.5%), followed by amoxicillin (40, 10%), cefixime (34, 8%), cotrimoxazole (34, 8%) and ampicillin (26, 6%). (Luthful, K. ARM et al, 2014)

Chapter 3:

Methodology

Method

A cross-sectional descriptive study was conducted using both qualitative and quantitative tools to gather data on Pediatrics patients between March-May 2016, three months of Field work at the **Dhaka Shishu Hospital** in Dhaka Division of Bangladesh. The selection of this Hospital for my study is to get data consistently and being representation of the population of Dhaka city. Since patients travelled from outside Dhaka to this hospital and this hospital is one of the Specialized for Pediatrics patients caring in Bangladesh, we chose this for our survey. A total of 477 prescriptions were the study sample and collected randomly from the community based care or Out- patients Departments (OPD) facility. While collecting data randomly for sample design, patients were asked their disease's sign and symptoms, advice from Doctor and simple questionnaires from our research protocol. Mode of collection was copied prescriptions by digital camera after taking consent of patients. Afterwards all Data were analyzed using the International Network for Rational Use of Drug (INRUD) prescribing indicator to obtain prescribing pattern data. The data obtained & the patient related parameters were computed using MS-Excel 2010. The sum total of averages and percentages were calculated by using the standard formulas in WHO's manual "How to investigate drug use in health facilities".

Chapter 4:

Results and Observation

Observation and Results

Data Analysis

Total prescription sample collected was 477 of which there are number diseases found in pediatrics out-patients at **Shishu Hospital Dhaka**. Diseases are demonstrated in table and respective Excel tools which is given below:

TABLE 2: Proportion of prescription containing different diseases from the total 477 prescription

Name of the Diseases	Number of Prescription	Percentage of each Diseases Prescription (%)
Diarrhea	75	15.72
Acute Respiratory Infection(ARI)	142	29.76
Mal digestion, Anorexia with Helminthiasis	31	6.49
Ear , Nose and Throat	52	10.90
Diseases		
Peptic Ulcer, gastric disease and abdominal pain	13	2.73
Skin Infection and allergies	49	10.27
Fever& common cold(cough)	100	20.96
Miscellaneous	15	3.14
Total	477	100

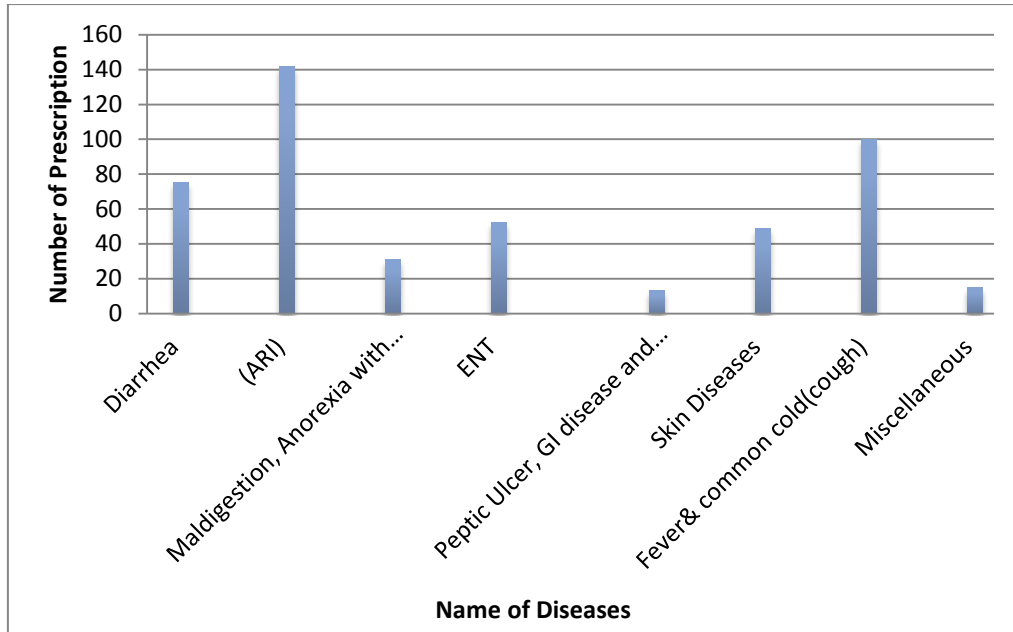


Fig 3: Number of prescription containing different systemic disorders among from the total prescription

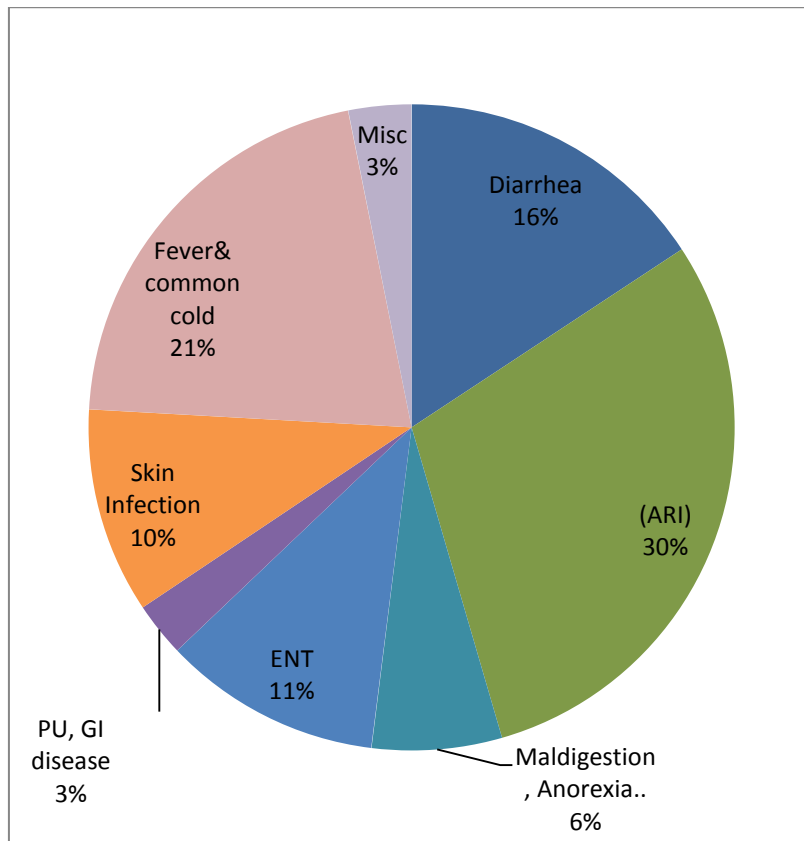


Fig 4: Prevalence of some common diseases in Pediatrics

Different Diseases in Pediatrics:

1. Diarrhea:

From the Data we get, sign and symptoms of patients and treatment pattern shows there are two types of Diarrhea which is prevalent in Pediatrics which is:

- a. Acute Watery Diarrhea(AWD)
- b. Acute Gastro Enterotitis with bleeding (AGE)

Table 3: Number of Prescription in variety of Diarrhea

Types of Diarrhea	Number of prescription	Percentage of the Encounter (%)
Acute Watery Diarrhea(AWD)	45	9.43
Acute Gastro Enterotitis with bleeding (AGE)	30	6.29
Total	(Prescriptions) 477	

2. Acute Respiratory Tract Infection (ARI):

Acute respiratory infection mostly occurs and common in pediatrics patients. The survey report, literature review or metadata have strengthen on my finding on pediatric out-patients survey that it is more common and frequently diseases to pediatrics.

There are many diseases under this generalized name which are Asthma, pneumonia, bronchospasm, bronchitis, chronic obstructive pulmonary diseases (COPD) etc.

We found 142 prescriptions related to acute respiratory Infection (ARI).

3. Mal digestion, Anorexia with Helminthiasis:

We got 31 encounter related to mal digestion, Anorexia and helminthiasis diseases. Each has different proportion of occurring.

Table 4: Number of Encounter of Mal digestion, Anorexia with Helminthiasis

Diseases	Number of Prescription	Percentage of Encounter (%)
Mal digestion	6	1.26
Anorexia(Loss of Appetite)	17	3.56

Helminthiasis	7	1.47
Growth Weakness	1	0.21
Total	(Prescriptions) 477	

4. Ear, Nose And Throat and Eye related diseases:

Total sample we got 52 incidents of these diseases.

Table 5: Number of ENT encounter in Pediatrics

Diseases	Number of Prescription	Percentage of Encounter (%)
Ear Infection	15	3.14
Glandular Infection	15	3.14
Lymphadenopathy	4	0.84
Nose related	2	0.42
Throat related	14	2.93
Eye related	2	0.42
Total	(Prescriptions) 477	

5. Gastro Intestinal Diseases:

We found variety of diseases under GI tract related in pediatrics. Peptic ulcer, Gastric ulcer and abdominal pain are more common to pediatrics. The sample we collected is 13.

Table 6: Number of encounter of GI diseases in Pediatrics

Diseases	Number of Prescription	Percentage of Encounter (%)
Abdominal pain	10	2.1
Peptic Ulcer	3	0.63
Total	(Prescriptions) 477	

6. Skin Infection and allergies:

There are 49 encounter of prescription having skin diseases.

Table 7: Number of encounter of Skin diseases in Pediatrics

Diseases	Number of Prescription	Percentage of Encounter (%)
Allergic contact Dermatitis(ACD)	20	4.2
Boil	4	0.84
Impetigo	10	2.1
Scabies	4	0.84
Skin allergy (mastocytosis and eczema and fungal infection)	8	1.68
Tinea	3	0.63
Total	(Prescriptions) 477	

7. Fever & Common cold(cough):

This is most common in pediatrics especially Fever and common cold (cough). Among fever the most predominated and dangerous is Enteric fever or Typhoid fever. We got 100 samples from pediatrics out patients.

Table 8: Number of Encounter in Fever and common cold (cough) in pediatrics

Diseases	Number of Prescription	Percentage of Encounter (%)
Typhoid	8	1.68
Fever & Common cold	92	19.3
Total	(Prescriptions) 477	

8. Miscellaneous:

There are other various diseases in minor proportion in pediatrics including brain diseases, mouth ulcer, urinary infection, and others. There 15 encountered prescriptions got from pediatrics out- patients.

Table 9: Number of Encounter in Miscellaneous diseases in pediatrics

Misc. Diseases	Number of Prescription	Percentage of Encounter (%)
Brain Diseases	3	0.63
Mouth ulcer	4	0.84
Dental	1	0.21
Urinary infection	1	0.21
Others.	6	1.26
Total	(Prescriptions) 477	

Baseline Survey

The mean number of drugs prescribed per patient:

The practitioners do this parameter to measure the degree of poly pharmacy. Calculation is done is that the Average, calculated by dividing the total number of different drug products prescribed, by the number of encounters surveyed. It is not relevant whether the patients actually received the drugs.

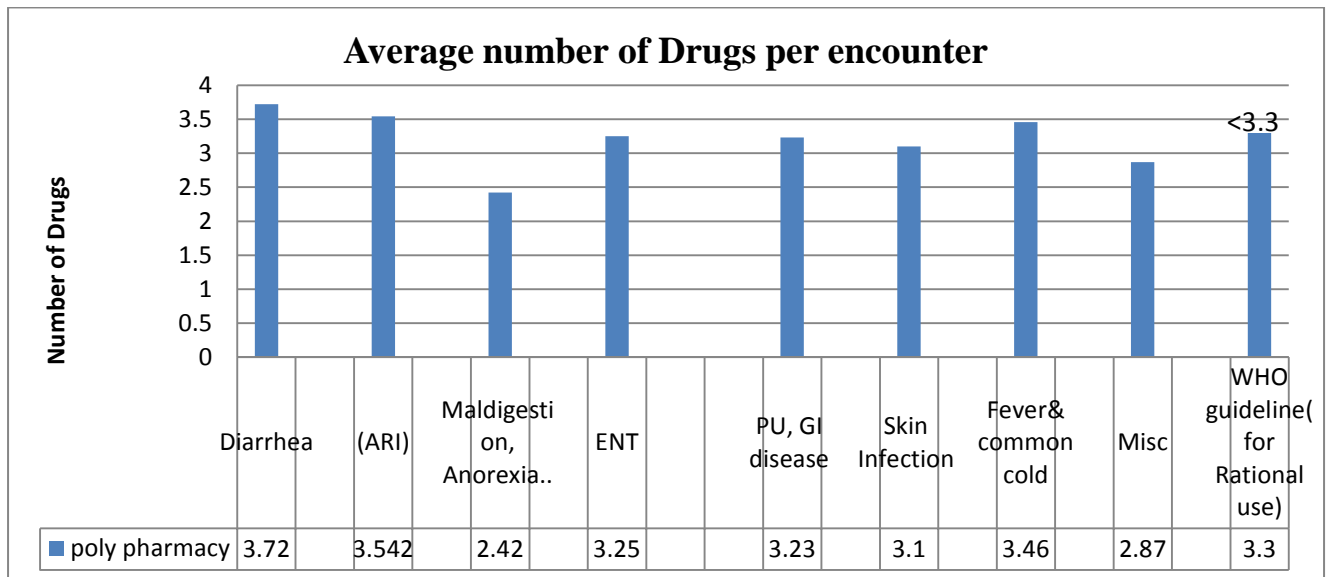


Fig 5: Average number of Drugs per encounter in individual diseases

For overall average number of Drugs per encounter can be measured from, total sample can be given in bar diagram as follows:

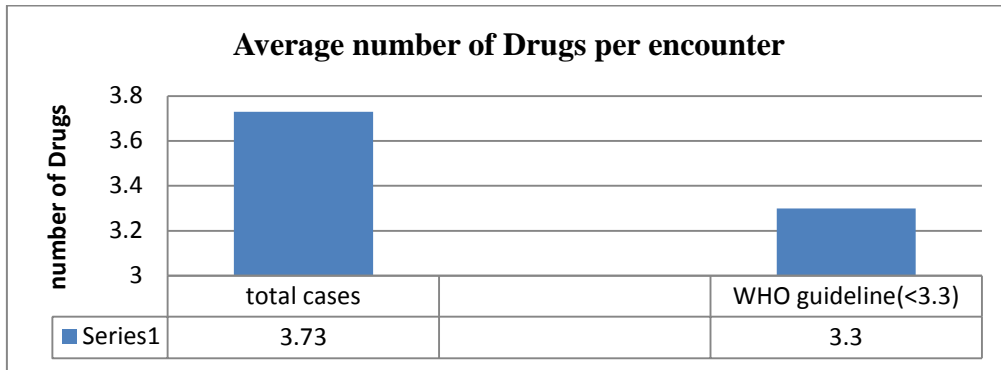


Fig 6: Average number of Drugs per encounter

Percentage of encounter with an antibiotic prescribed:

This is done to measure the overall level of use of two important, but commonly overused drugs. Calculation of this percentage is done by dividing the number of patients encounters during which an antibiotic prescribed divided by the total number of encounters surveyed. From overall population of data (n=477), the sample was taken first. We stratified them then collect sample by simple random sampling or systematic random sampling. A systemic Random sampling was done and 66 samples were taken from the data we got. Each stratified diseases which has population greater than 15, Sampling was done by order of 10 by systemic manner. And remaining diseases which have population less than 10, sample was collected by an order of 4 in systemic manner.

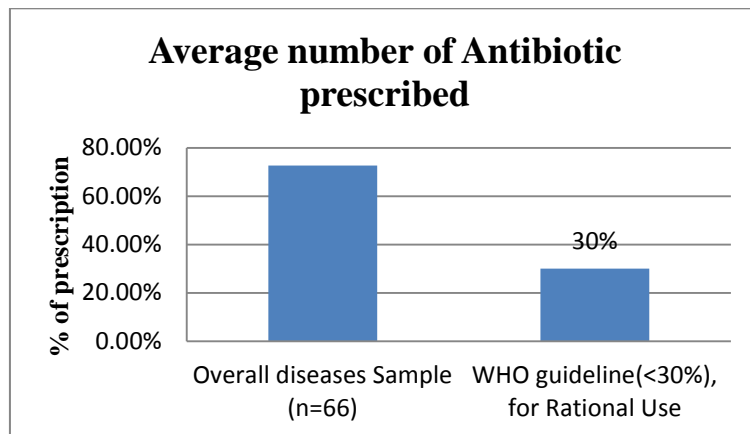


Fig 7: Average number of Antibiotic prescribed

Percentage of encounter with an injection prescribed:

This study is done to measure commonly overused and costly forms of drug therapy. Since we surveyed on Pediatric out-patients, we don't find any encounter of Injection prescribed from practitioners.

Percentage of drugs prescribed by generic name:

The study is done to measure the tendency to prescribe by Generic name. Higher the number of Generic name given in prescription, the more will develop compliance and better treatment without exploitation. We found only 0.93 percent of drug prescribed from Generic Name.

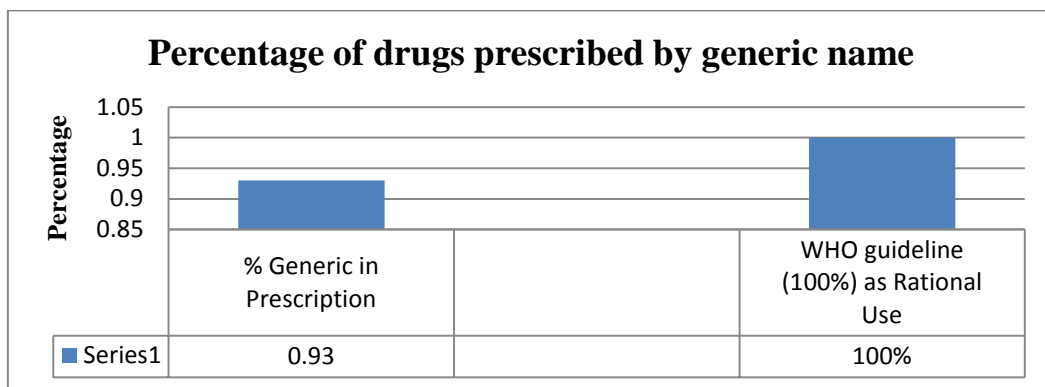


Fig 8: Percentage of drugs prescribed by generic name

Percentage of drugs prescribed by from essential drug lists:

The study is done to measure the degree to which practices conform to a national drug policy, as indicated by prescribing from the national essential drug list or formulary for the type of facility surveyed. From data analysis we found that cases of 55.50 percentages of drugs prescribed complied with the essential drug lists.

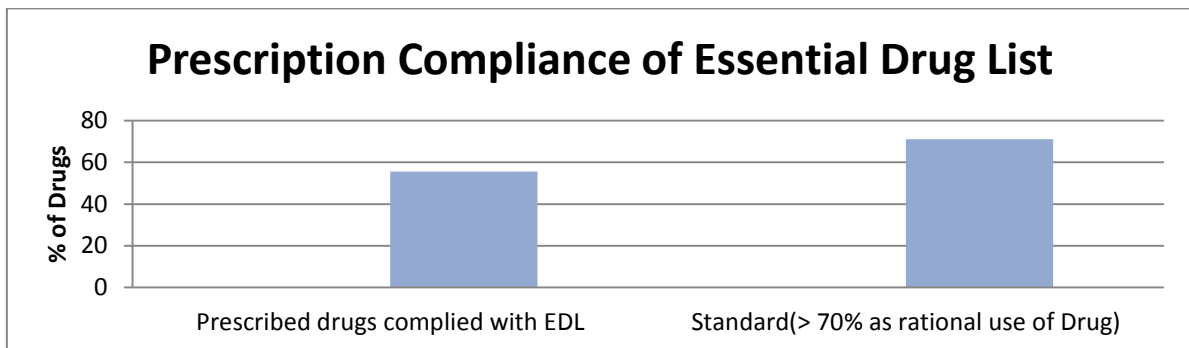


Fig 9: percentages of prescription Compliance of Essential Drug List

Prescribing pattern of Acute Respiratory Infection (ARI) in before child

Prescription pattern of Acute Respiratory Infection in Infants (1st months to 23rd months) was done on 67 prescription over total case finding on ARI diseases. The Classes of Drug prescribed as follows:

Table 10: Prescription pattern of ARI in before child by Drugs category

Groups of Drug in ARI	Number of encounter	Percentages of Drugs (%)
Antibiotic	64	26.66
NSAID	41	17.08
Anti-Histamine	37	15.42
Bronchodilator	44	18.33
Mucolytics	8	3.33
Multi vitamin	7	2.92
Adrenergic vasoconstrictor	2	0.83
Anthelminthics	2	0.83
NaCl Drop	14	5.83
Corticosteroid	4	1.66
Others	17	7.08
Total	(Drugs)240	100

A total encounter and its percentages of antibiotic and respective drugs cane given in table as follows:

Table 11: Prescription pattern in terms of % of Encounter of ARI in before child by Drugs categories

Groups of Drug in ARI	Number of encounter	Encounter Percentages (%)
Antibiotic	64	95.52
NSAID	41	61.2
Anti-Histamine	37	55.2
Bronchodilator	44	65.67

Mucolytics	8	11.94
Multi vitamin	7	10.45
Adrenergic vasoconstrictor	2	2.98
Anthelminthics	2	2.98
NaCl Drop	14	20.90
Corticosteroid	4	5.97
Others	17	25.37
Total	Prescription (67)	

Specific prescribed drugs from the above sample also can be shown in table as follows:

Table 12: Prescription pattern in terms of % encounter of ARI in before child by Individual Drugs

Prescribed drugs	Number of Encounter	Percentages of encounter (%)
Amoxicillin	9	13.43
Azithromycin	22	32.83
Cefaclor	7	10.45
Cephadrine	5	7.46
Ciprofloxacin	4	5.97
Cefixime tri-hydrate	10	14.93
Erythromycin	4	5.97
Cefpodoxime proxetil	1	1.49
Moxifloxacin	1	1.49
Co-amoxiclav	1	1.49
Paracetamol	41	61.19
Chlorpheniramine	6	8.95
Diphenhydramine	7	10.45
Fexofenadine	3	4.48

Ketotifen fumerate	19	28.36
Desloratidine	1	1.49
Ebastine	1	1.49
Salbutamol	41	61.19
Theophylline	3	4.48
Ambroxol HCl	7	10.45
Bromohexine	1	1.49
Multivitamin	7	10.45
NaCl Drop	14	20.9
Albendazole	1	1.49
Prednisolone	4	5.97
ORS	6	8.95
ZnSO₄	6	8.95
Folic Acid	1	1.49
Ondansetron	2	2.98
Oxymetazoline	1	1.49
Xylometazoline	1	1.49
Butamirate Citrate	1	1.49
MonteLukast	1	1.49
Total	Prescription (67)	

Dosage Form pattern from prescribed drugs can also be described for Pediatrics patient’s compliance of WHO guideline as follows:

Table 13: Prescription pattern of ARI in before child by Dosage from pattern

	Dosage Form					
	Syrup	Tropical (Drop)	Sachets	Tablets	Suspension	Injection
Cases	187	39	5	2	7	No
Total	240					

Overall prescribing indicators can be given as follows:

Table 14: Results of prescription audit (n= 477)

Prescribing indicator	Results	WHO Values (recommended)
Average number of drugs per prescription	3.73	<3.3
Percentage of drugs prescribed by generic name (sample=66)	0.93%	100%
Percentage of prescriptions with an antibiotics prescribed (sample=66)	72.72%	<30%
Percentage of prescriptions with and injection prescribed (sample=66)	0%	>10%
Percentage of drugs prescribed from Essential Drug List	55.50%	>70%

Percentage of Prescription compliance of standard treatment guidelines (STG) by World Health Organization (WHO):

Standard treatment Guideline (STG) is necessary for better therapeutically effective treatment and economically efficient use of drugs. From the survey analysis, the percentages of prescription for Acute Respiratory Infection in before child age which compliance with Standard treatment guideline prepared by World Health Organization (WHO) is 0%.

Chapter 5:

Discussion

Discussion:

This study was an attempt to find the existing pattern of prescription of Pediatric out patients at **Dhaka Shishu Hospital**, Dhaka. Among 477 prescriptions, data were analyzed by using some of the INRUD indicators. Through the exercise we identified that, Out- patients department (OPD) of Dhaka Shishu Hospital did not follow the criteria of rational prescribing and did not follow the Standard Treatment Guideline (STG) prepared by World Health Organization (WHO).

Diseases pattern:

In current study, we found a number of diseases in pediatrics patients. The percentages of occurrence of those diseases while observing total encounters are Diarrhea (15.72%), Acute Respiratory Infection (ARI) (29.76%), Mal-digestion, Anorexia with Helminthiasis (6.49%), Ear, Nose and Throat (10.90%), Peptic Ulcer, gastric disease and abdominal pain (2.73%), Skin Infection and allergies (10.27%), Fever & common cold (20.96%) and Miscellaneous (3.14%). The Highest number of occurrence of the diseases and most common is Acute Respiratory Infection. Study shows nearly 30% of prescribed patients had acute respiratory Infection diseases which include Asthma, pneumonia, bronchospasm, bronchitis, wheezing etc. Another most common prevalent disease in Pediatrics was Fever with common cold and Diarrhea. There are 45 of cases acute watery diarrhea and 30 of cases Acute Gastroenteritis found in Study. Among fever the most predominated and dangerous is Enteric fever or Typhoid fever. We found 8 cases that had typhoid fever and another 92 cases we found Fever and common cold. A number of 31 encounters of which we found Mal-digestion, Anorexia, Helminthiasis and growth weakness occurred in six, seventeen, seven and one prescription respectively. The pediatric patients who had Ear, nose and Throat and eye related diseases, in 15 cases we got Ear infection and glandular infection separately.

Lymphadenopathy occurred in 4 cases, whereas Nose and eye related had 2 encounters in each case. There were 14 encounters we got Throat related diseases. In our study, the number of prescription of abdominal pain and Peptic ulcer are 10 and 3 cases respectively.

For pediatric skin disease, there was lot of diseases we found in our survey. There were 49 prescription related to skin diseases of which Allergic contact dermatitis accounts for 4.2 %, 0.84% were Boil, 2.1% were Impetigo, 0.84 % cases were scabies, 1.68 % cases were Skin allergy (fungal, eczema and mastocytosis) and 0.63% of cases were Tinea diseases.

There were also some miscellaneous diseases we found in the survey. The number of encounter of Brain diseases, Mouth ulcer, dental, urinary infection and others were 3, 4, 1, 1 and 6 cases respectively.

Base line Survey on Drug use Indicator/ Prescribing Indicators:

In this study, on an average, 3.73 drugs were prescribed per prescription during study in May 2016. There were no study was held before our study. The number of drugs per prescription whether improved or not, we could not determine due to absence of study in Out-patient department at Shishu Hospital Dhaka. Researcher can base my study and further look into the improvement of prescribing pattern at that Hospital. According to WHO, the number of drugs per encounter must be less than 3.3 drugs. Study indicates that they did not follow the criteria of WHO.

In this study 72.72% prescriptions were prescribed with antimicrobials. The use of antibiotic in prescription were calculated from the sample (66) taken from overall population (n=477) by Systemic random Sampling. According to WHO, the criteria and for rational use of Drug the value must be less than 30%. The study shows OPD department did not follow the guideline as per INRUD criteria.

In the current study, only 0.93% drugs were prescribed under generic a name which is very much unsatisfactory. The study may indicate that prescribers are not aware of the importance of generic name. According to WHO, the criteria and for rational use of Drug the value must be near 100%.

About 0 % prescriptions contained an injection which was satisfactory for pediatric patients from Out-patients department. And from this perspective they followed the WHO guideline. According to WHO, the criteria and for rational use of Drug, the Percentage of prescriptions with and injection prescribed would be less than 10%. But for comprehensive study researcher needs to find what the value in this perspective in Facility based care or In-Patients Departments. For number of reason, we had no capacity to run the survey In-Patients department at that Hospital.

Also the Percentage of drugs prescribed from Essential Drug List was 55.50 %. According to WHO, the criteria of the Percentage of drugs prescribed from Essential Drug List must be greater than 70%. In our study it was also indicated that prescribers were unaware to National Drug policy or Government has not any initiatives and controlling on training or programme to monitor the compliance to Rational Use of Drug in Bangladesh. We assume the value would be less in other private Hospital in Dhaka and Bangladesh as well.

Researchers must look onto those parameters at those Hospitals in future survey on prescribing pattern.

Prescribing pattern of ARI in pediatrics before child's age:

In our study, prescription pattern of Acute Respiratory Infection in Infants (1st months to 23rd months) was done on 67 prescription over total case finding on ARI diseases. From the 67 prescription, we got 95.52 % of prescription contain antibiotics. From this 95.52% of prescription which is 64 cases of encounter among 67 cases contains different types of antibiotics. Study shows that 13.43% of patients were treated with Amoxicillin, 32.83% were treated with Azithromycin, 10.45% were treated with Cefaclor, 7.46% were treated with Cephadrine, 5.97% were treated with Ciprofloxacin and Erythromycin separately, 14.93% were treated with Cefixime tri- hydrate, and Cefpodoxime proxetil, Moxifloxacin and Co-amoxiclav were given 1.49 % of encounter in separate manner.

NSAID was given in 61.2% of encounter. For fever, only Paracetamol was given in 41 encounters out of 67 prescriptions. 65.67% of prescription which is 44 prescriptions was prescribed with Bronchodilators. Salbutamol was given in 41 encounter which accounts for 61.19% of prescription and remaining 3 cases Theophylline as bronchodilators was given which is 4.48% of total prescription.

Anti-histamines were prescribed in 55.2% of encounter which was a number of 37 prescriptions. Anti-histamines include Chlorpheniramine was given in 8.95% of prescription, 10.45% were treated with Diphenhydramine, 28.36% were treated with Ketotifen fumerate, 4.48% were treated with Fexofenadine and 1.49% were treated with Desloratidine and Ebastine separately.

ARI patients in Infants were also prescribed by Mucolytics and Multivitamin. The percentage of Mucolytic given in prescription was 11.94% and 10.45% were treated with Multivitamin. Ambroxol HCl was the most common Mucolytics used in treatment as percentage of 10.45 and Bomohexine accounts for only 1.49% of prescription out of 67 prescriptions.

In our current study, Pediatrics were prescribed mostly (187 cases) by syrup as orally Administered drugs. There were no injection prescribed in pediatrics

In our current study, the percentages of prescription for Acute Respiratory Infection in before child age which compliance with Standard treatment guideline prepared by World Health

Organization (WHO) is 0% which was unsatisfactory. Prescribers was either unaware of the correct treatment guideline or Unsuitability of WHO prescribed Standard treatment guideline to context of Bangladesh Diseases medium or negligence of Government Drug control Authority to monitor them.

Chapter 6:

Conclusion

Conclusions:

The pattern of rational drug use at **Dhaka Shishu Hospital** at the Out- Patients department in Dhaka was not satisfactory at all, though the level of injection use at the OPD facilities was recommendable compared to WHO indicators and encouraging. Drugs were prescribed unnecessarily and irrationally where no drug therapy should be required. For more compliance to STG, further efforts must be made to improve the therapeutic practices of health professionals without irrational prescription and these efforts will not be avoided even in the reaching hospital, villages and city Hospital like these. Intervention is needed to improve prescribing behaviors of practitioners such as short problem based training course in pharmacotherapy and rational use focused workshops can improve prescription behavior and skills. Clear and comprehensives rules should be formulated and implemented by the government to ensure rational prescribing. The result obtained in this study provides a baseline for researchers and policy makers in Bangladesh, to monitor and make the necessary educational, managerial and regulatory interventions, to improve the situation in the health care facilities.

Chapter 7:

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