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Prescription monitoring & the pattern of prescribing drugs in pediatric patients done in a periodic study

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ABSTRACT

Pediatric patients, defined as those younger than 18 years. Factors in pediatric patients, including the limitations of commercially available dosage formulations, the unexpected administering of medicines, the general inadequacy of clinical pharmacology training, the shortage of information about drug use in children all these add to the difficulties faced by the practitioner, hence one should prescribe judiciously, carefully select the safest dosage regimen available. Considering the above facts the present study was designed to monitor the prescription and its outcomes in pediatric patients. The study was conducted at pediatric departments in a government hospital at ibrahimpatnam, during the study period of 6 months and a total of 268 cases were collected, the data was collected and analyzed. In the study majority of the age groups included were in the age groups of 5-12 yrs (42.10%) ,1-5 yrs (26.10%),0-1 yr(16.20%) ,12-18 yrs (15.60%).The gender distribution in the study included 146 male patients (54.5%) and 122 female patients (45.5%).The disease prevalence in the following study concluded that the highest occurrence of the diseases in their ascending order showed: U RTI's(46.60%), ACUTE FEBRILE ILLNESS(25.70%), followed by DIARRHOEA(5.90%). The standard treatment for upper RTI: Chlorpheniramine maleate + Paracetamol + Phenylephrine.

Keywords: Pediatrics, Prescription monitoring, Pediatric infections, Treatment, Prevention.

INTRODUCTION

Pediatrics

The American Academy of Pediatrics (AAP) has developed the following definition of pediatrics: Pediatrics is the specialty of medical science concerned with the physical, mental, and social health of children from birth to young adulthood. Pediatric care encompasses a broad spectrum of health services ranging from preventive health care to the diagnosis and treatment of acute and chronic diseases. Pediatrics is a discipline that deals with biological, social and environmental influences on the developing child and with the impact of disease and dysfunction on development [1].

The International Committee on Harmonization (2001) has suggested that childhood be divided into the following age groups for the purposes of clinical trials and licensing of medicines:

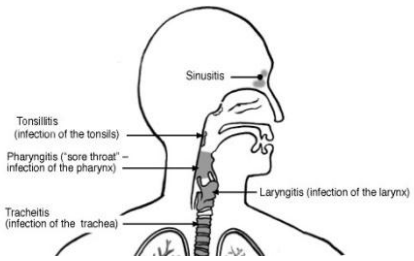
- preterm newborn infant
- term newborn infants (0–27 days)
- infants and toddlers (28 days to 23 months)
- children (2–11 years)
- adolescents (12–16/18 years) [2]

Prescription monitoring

The criteria for monitoring drugs in children are the same as those for adults , but several additional factors must be considered. Neonates, infants, and children undergo major and rapid age-related physiologic and biochemical changes, especially during the first year of life, resulting in different clinical pharmacokinetic and pharmacodynamic parameters from adults. Recent indications are that approximately 12% of all drugs prescribed in the United States are for children age 9 years and younger. Further, review of drug-dosing habits in neonatal intensive care units has shown that the average number of drugs administered to premature infants weighing less than 1,000 g varies from institution to institution but is usually in the range of 15 to 20 drugs; infants weighing more than 2,500 g usually receive 4 to 10 drugs during their hospital stay. Obviously, drug concentrations in many of these patients need to be monitored by the laboratory, and the possibility of drug interactions needs to be considered. Thus, it is important to have a clear understanding of not only the principles of TDM but also the additional factors inherent in and specific to pediatric clinical pharmacology [3]. The availability of new medications has been accompanied by an increase in over prescribing for common ailments in children, a problem that has been reported worldwide, both from developed and developing countries [4].

Pediatric infections

Upper respiratory tract infections (**uri** or **urti**) are illnesses caused by an acute infection which involves the upper respiratory tract including the nose, sinuses, pharynx or larynx. This commonly includes nasal obstruction, sore throat, tonsillitis, pharyngitis, laryngitis, sinusitis, otitis media, and the common cold.



In terms of pathophysiology, rhinovirus infection resembles the immune response. The viruses do not cause damage to the cells of the upper respiratory tract but rather cause changes in the tight junctions of epithelial cells. This allows the virus to gain access to tissues under the epithelial cells and initiate the innate and adaptive immune responses.

Target likely organisms with first-line drugs: Amoxicillin**,** Amoxicillin/Clavulanate. Infections of the Upper Respiratory Tract (URT) are the most commonly encountered illness of childhood and one of the main reasons for pediatric consultations. More than 200 viruses can cause upper respiratory tract infections (URTIs). Acute respiratory infection accounts for 20-40% of outpatient in Pediatrics [5].

Diarrhoea is a condition in which faeces are discharged from the bowels frequently and in a liquid form. Diarrhoea is the third leading cause of childhood mortality in India, and is responsible for 13% of all deaths/year in children under 5 years of age, killing an estimated 300,000 children in India each year [6].

Scabies, previously known as the seven-year itch, is a contagious skin infestation by the mite Sarcoptes scabiei. The most common symptoms are severe itchiness and a pimple-like rash. Occasionally tiny burrows may be seen in the skin. The symptoms are caused by an allergic reaction of the host's body to mite proteins, though exactly which proteins remains a topic of study. The mite proteins are also present from the gut, in mite feces, which are deposited under the skin. The allergic

reaction is both of the delayed (cell-mediated) and immediate (antibody-mediated) type, and involves IgE (antibodies, it is presumed, mediate the very rapid symptoms on reinfection).Treatment options to control itchiness include antihistamines and prescription anti-inflammatory agents.

Gastroenteritis is a non-invasive infection of the small or large bowel that manifests clinically as diarrhoea and vomiting. Development of symptoms after ingestion of gastro-intestinal pathogens depends on two factors. First, sufficient organisms must be ingested and then survive host defense mechanisms, and second, the pathogens must possess one or more virulence mechanisms to cause disease. Fluid and electrolyte replacement is the cornerstone of treatment of diarrhoeal disease. Symptomatic treatment with antiemetics and antimotility (antidiarrhoeal) agents is sometimes used, especially as self-medication. Antimicrobial agents may be useful both in effecting symptomatic improvement and in eliminating faecal carriage of pathogens and therefore reducing the risk of transmitting infection to others [7].

Treatment

Antibiotics are among the most commonly prescribed drugs in paediatrics. Because of an overall rise in health care costs, lack of uniformity in drug prescribing and the emergence of antibiotic resistance, monitoring and control of antibiotic use is of growing concern and strict antibiotic policies should be warranted. Before such policies can be implemented, detailed knowledge of antibiotic prescribing practice is important [8]. Systemic antibiotics account for more than one-third of all prescriptions in children; hence, antibiotic prescriptions in children are a major public health concern. Moreover, data regarding rational antibiotic use in children is very limited. Hence, it is essential that the antibiotic prescribing pattern be evaluated periodically for its rationality of use and cost [9].

U RTI management

The main emphasis of management is symptom relief of fever, nasal congestion and coughing. A variety of adrenergic agonist, anticholinergic, antihistamine preparations, antitussives and expectorants are marketed for these purposes. Common constituents of such medication include first generation antihistamines, antipyretics (paracetamol) or anti-inflammatory agents (ibuprofen), cough suppressants such as dextromethorphan, expectorants (guaifenesin) and decongestants such as pseudoephedrine and phenylpropanolamine.

Prevention

The subsequent reduction of infectious disease through sanitation and vaccination, and a continuing appreciation of the powerful impact of the social context of children's well-being, reinforced this early emphasis on preventive care. More recently, practitioners and policy makers have recognized the importance of children's social and physical environments on life-long health and social competence. These changes are casting increasing attention on the preventive care available to young children and their families. Recommendations to improve the quality of preventive care include such strategies as risk-based individualized care plans; greater use of tested practice management tools, such as flow sheets and e-mail; team care; and standardized data collection, including structured screening. Both the content of preventive care and the training of practitioners to provide that care should be guided by a predetermined set of measurable outcomes for which providers should be held accountable, as well as other outcomes to which they should be expected to contribute [10].

METHODS

Source of data: Prescriptions of Paediatric patients

METHOD AND COLLECTION OF DATA:

- **Study site:** Study conducted at pediatric department in government hospital, those visiting on OPD basis in the rural area.
- **Study duration:** the study is conducted during a six month period from October 2016 to March 2017.
- **Study design:** it is a prospective observational study conducted on the pediatric patients.
- **Study criteria :** The following study is carried out using the following factors,

Inclusion criteria

- Patients of pediatric age group.

- Pediatric patients with different diseases and infections.

Exclusion criteria

- Patients above pediatric age group.
- Patients who are immunocompromised and have psychiatric illnesses.
- Patients with congenital abnormalities.

Study procedure

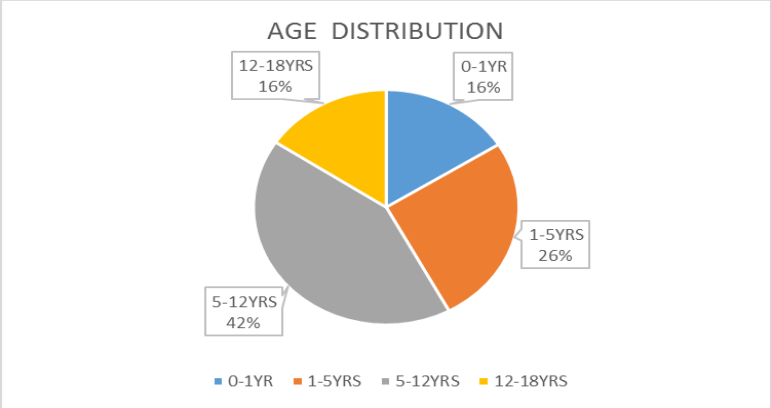
It is a prospective based study where in the pediatric patients visiting the doctor are evaluated, diagnosed, prescribed with suitable therapy by the Pediatrician. These respective prescriptions are taken and noted for the varied prescribing pattern of drugs for several diseases and infections, also including the patient's demographics, reasons for admission, diagnosis, significant past medical history (if any), family history.

RESULTS AND DISCUSSIONS

Age

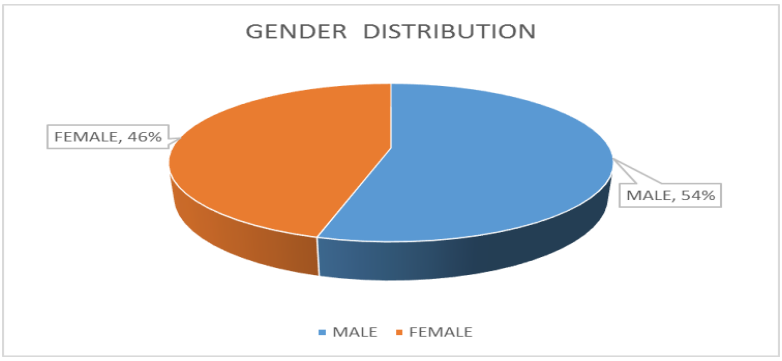
The age groups included in the study were in the age groups of 5-12 yrs (42.10%), 1-5 yrs (26.10%),0-1 yr(16.20%) ,12-18 yrs (15.60%).

AGE GROUPS	0-1 YEARS	1-5 YEARS	5-12 YEARS	12-18 YEARS
NO. OF PATIENTS	43	70	113	42
TOTAL NO. OF PATIENTS	268	268	268	268
PERCENTAGE	16.20%	26.10%	42.10%	15.60%



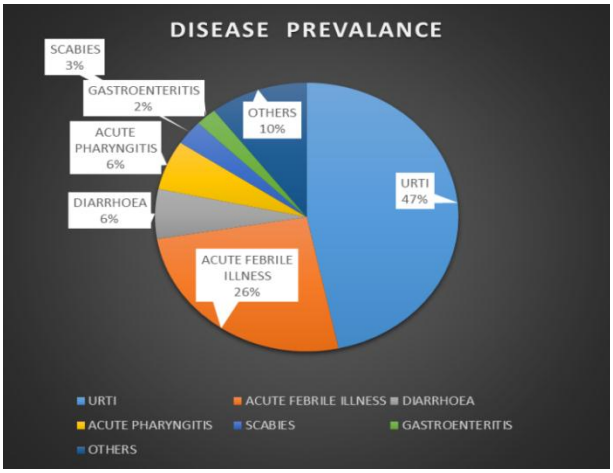
GENDER DISTRIBUTION OF STUDY POPULATION (N=268)

GENDER	NO. OF PATIENTS	PERCENTAGE
MALE	146	54.5%
FEMALE	122	45.5%



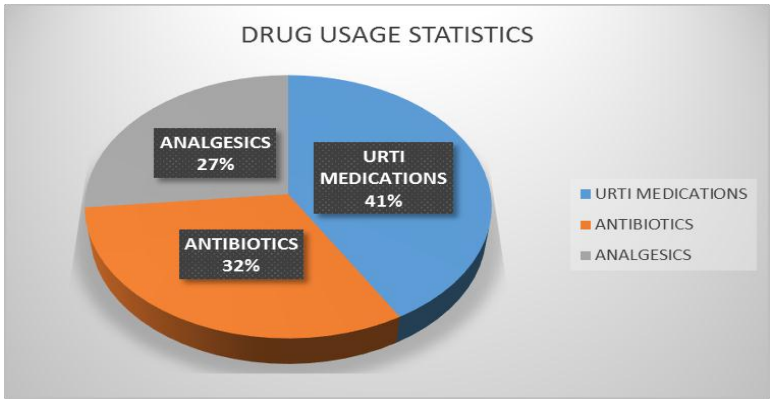
DISEASE PREVALENCE IN THE STUDY POPULATION

DISEASE	UPPER RESPIRATORY TRACT INFECTIONS	ACUTE FEBRILE ILLNESS	DIARRHOEA	ACUTE PHARYNGITIS	SCABIES	GASTROENTERITIS	OTHERS
NO. OF PATIENTS	125	69	16	16	8	6	28
TOTAL NO. OF PATIENTS	268	268	268	268	268	268	268
PERCENTAGE	46.60%	25.70%	5.90%	5.90%	2.90%	2.20%	10.40%



DRUGS USED IN THE STUDY POPULATION

DRUGS USED	UPPER RTI MEDICATIONS	ANTIBIOTICS	ANALGESICS
NO. OF PATIENTS	264	202	169
TOTAL NO. OF PATIENTS	268	268	268
PERCENTAGE	41%	32%	27%

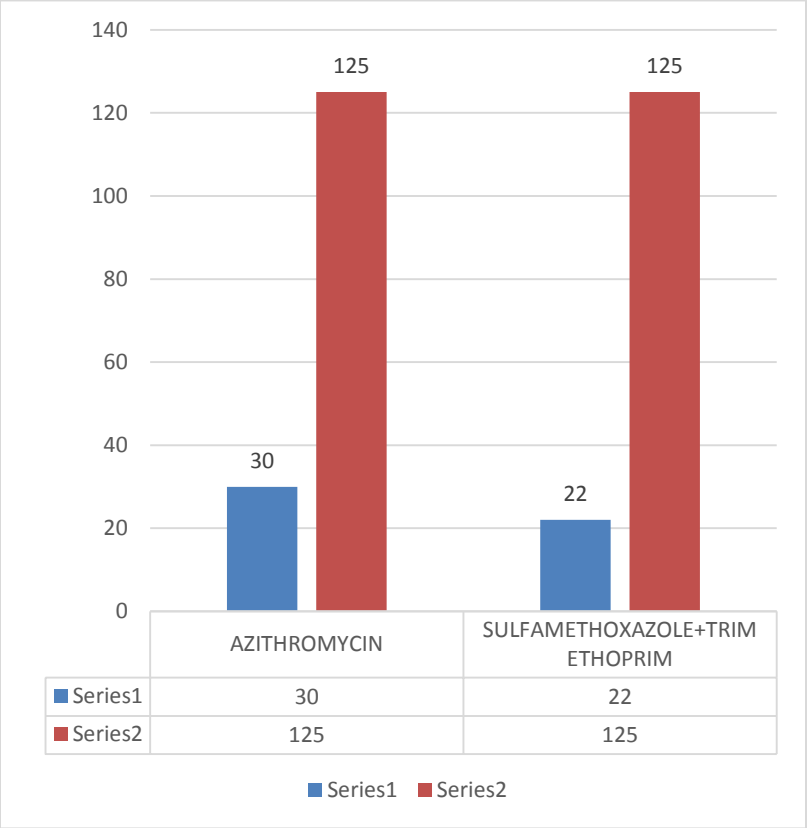


ANTIBIOTICS USAGE PATTERN IN CASE OF UPPER RTI

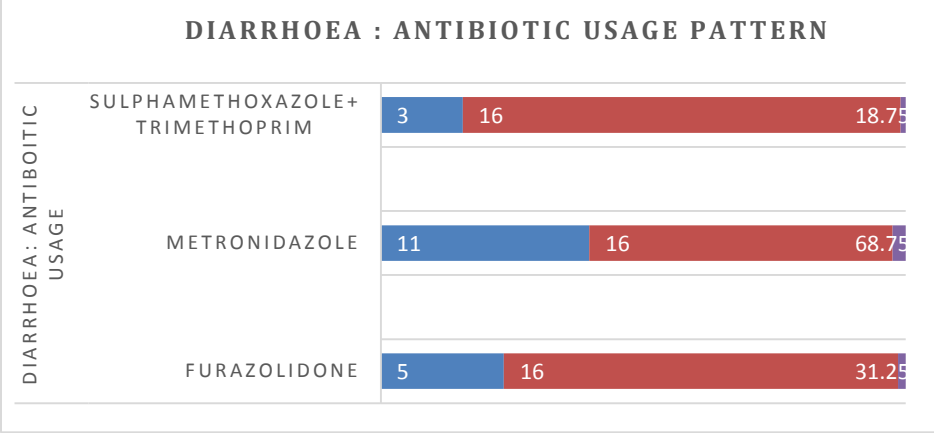
ANTIBIOTIC USED	AZITHROMYCIN **(A)**	SULPHAMETHOXAZOLE + TRIMETHOPRIM **(B)**
TOTAL PATIENTS WITH UPPER RTI	125	125
DRUG USAGE	30	22
PERCENTAGE	**24 %**	**17.6 %**

Drug A = single entity (24%) & **Drug B** = combinational drug (17.6%)
Series 1: Azithromycin
Series 2: Sulfamethoxazole + Trimethoprim

ANTIBIOTIC USED	**FURAZOLIDONE**	**METRONIDAZOLE**	**SULPHAMETHOXAZOLE + TRIMETHOPRIM**
TOTAL NO. OF PATIENTS WITH DIARRHOEA	16	16	16
NO. OF DRUGS USED	5	11	3
PERCENTAGE	31.25%	68.75%	18.75



ANTIBIOTIC USAGE PATTERN IN DIARRHOEA



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