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A PROSPECTIVE OBSERVATIONAL STUDY TO IDENTIFY DRUG THERAPY PROBLEM IN PEDIATRIC PATIENTS IN A TERTIARY CARE HOSPITAL

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ABSTRACT

Drugs plays an important role in treating diseases and improving health. However, inappropriate drug use can lead to the occurrence of Drug therapy problems (DTPs). Factors that contribute for occurrence of drug therapy problems in pediatric patients involve such as poly-pharmacy, certain infectious & parasitic diseases, type of admission. The present study was an prospective observational study conducted in Tertiary care hospital for a period of 6 months and had an objective to identify the disease and the drug category which Are prevalent with drug therapy problem in pediatric patients. Patients of both sexes between age group of 1 month-17 years with any illness were included in the study of the 150 patients, 88 were male and 62 were female. The current study revealed that infectious diseases (55.93%) and antibiotics (55%) drug therapy which has highest prevalence of causing drug therapy problem. The finding revealed that the infectious disease was the major category of diseases linked to the DTP's and Antibiotics to be the major class of drugs associated with the DTP's. Clinical pharmacists can play major role in promoting better medication use and ensuring that the Paediatric patients receive appropriate medications for their conditions.

KEYWORDS: Drug therapy problems, paediatrics, prevalent.

INTRODUCTION

Drugs play a crucial role in treating diseases and enhancing health outcomes. Nonetheless, inappropriate drug use can lead to Drug Therapy Problems (DTPs). As per the

Cipolle/Morley/Strand classification, DTPs encompass any undesirable event experienced by the patient related to drug therapy, which either interferes with or is suspected to interfere with achieving the desired patient outcome.[1] DTPs can be identified through a comparison of the appropriateness of indications, dosage, drug administration timing, and adverse reactions with commonly accepted recommendations. Pediatric patients, in particular, are at a heightened risk for drug-related problems.[2,3] Most DTPs are related to prescribing: drug selection, dosage, and usage, DTP occurrence may result in treatment failure, and increase the rate of follow-up visits and rehospitalization, as well as significantly increase the need to prescribe additional drugs and the treatment costs.[4,5,6]

Pediatric inpatients face triple the medication error risk compared to adults, often resulting in harm. Neonates exhibit prolonged gastric emptying, affecting drug absorption. Acid-labile drugs like benzylpenicillin are well-absorbed, while others like phenytoin show low absorption rates. Gastric reflux into the esophagus is frequent in the first year of life.[7]

Numerous factors contribute to drug therapy problems in pediatric patients, such as poly-pharmacy, specific diseases, admission type, hospital stay length, comorbidities, insufficient information, and poor patient drug knowledge. Additionally, the rise in chronic diseases among children since the 1980s has led to longer treatment, higher relapse rates, and complex regimens, further elevating the risk of drug-related issues.[8]

MATERIALS AND METHODS

STUDY DESIGN: A Prospective observational study was carried out to identify the disease and drug category which are prevalent with drug therapy problems in paediatric patients.

SAMPLE SIZE: The sample taken for the study was 150. Sample size was calculated using finite population formula and was based on convenience.

STUDY CRITERIA

Inclusion criteria

- Patients of both sexes between age group of 1 month-17 years.
- Patients with any illness.

Exclusion Criteria

- Patient care taker who are not willing to participate in the study.

SOURCE OF DATA COLLECTION

Data for the study were gathered through comprehensive data collection forms, capturing patient demographics, personal and medical histories, current diagnoses, medication details, and any treatment-related issues noted by the patients during their care.

STATISTICAL ANALYSIS

The collected data was analysed using Microsoft Excel 2019.

RESULT

PATIENT DEMOGRAPHICS

The study enrolled 150 pediatric patients aged between 1 month and 17 years old. Patient details, including medical history, were collected using a patient interview form. Of the total participants, 88 were male and 62 were female. Among them, 142 patients had a single ailment, while 16 patients were prescribed more than 5 drugs. Further demographic information on the study participants is provided in Table 1.

Table 1: Demographic features and clinical characterization of the patient.

VARIABLE	CATEGORY	FREQUENCY N=150	PERCENTAGE (%)
AGE	0-1month 1month-1 year 2years-12 years 13years-17years	1 14 111 24	0.67 9.33 74 16
GENDER	Male Female	88 62	58.67 41.33
NUMBER OF DRUGS PRESCRIBED	1-4 ≥ 5	134 16	89.33 10.67
NUMBER OF AILMENTS	Single ailment Multiple ailment	142 8	94.67 5.33
PATEINT DISTRIBUTION	In Patients Out Patients	78 72	52 48

DISEASE CATEGORIES IDENTIFIED WHICH ARE PREVALENT WITH DTP'S IN PAEDIATRIC PATIENTS

The diseases identified with DTP's in this study were categorized as Infectious diseases, Neurological disorders, Orthopedic disorders, Dermatological and others. Infectious disease and dermatological disorders were having the greatest number of DTP's. Figure 7 shows the various Ailment categories identified with DTP's. The details of diseases identified with DTP's in this study are given in the Table 2.

Table 2: Diseases identified with DTP's in this study.

CATEGORY	DISEASES IDENTIFIED	NO. OF PATIENTS (n=118)	PERCENTAGE (%)
Infectious disease	Chicken pox	16	13.56
	Scarlet fever	6	5.8
	Measles	3	2.54
	LRTI	19	16.10
	URTI	15	12.71
	Whooping cough	8	6.78
	Mumps	11	9.32
Neurological disorder	Seizures	5	4.24
Orthopaedic disorders	De quervains tenosynovitis (DT)	11	9.32
	Cervical Radiculopathy (CR)	5	4.24
	Juvenile arthritis	4	3.39
Dermatological disorders	Urticaria	5	4.24
	Pityriasis versicolor	1	0.85
Others	Others (Stomach ache, common cold and minor injuries)	9	7.63

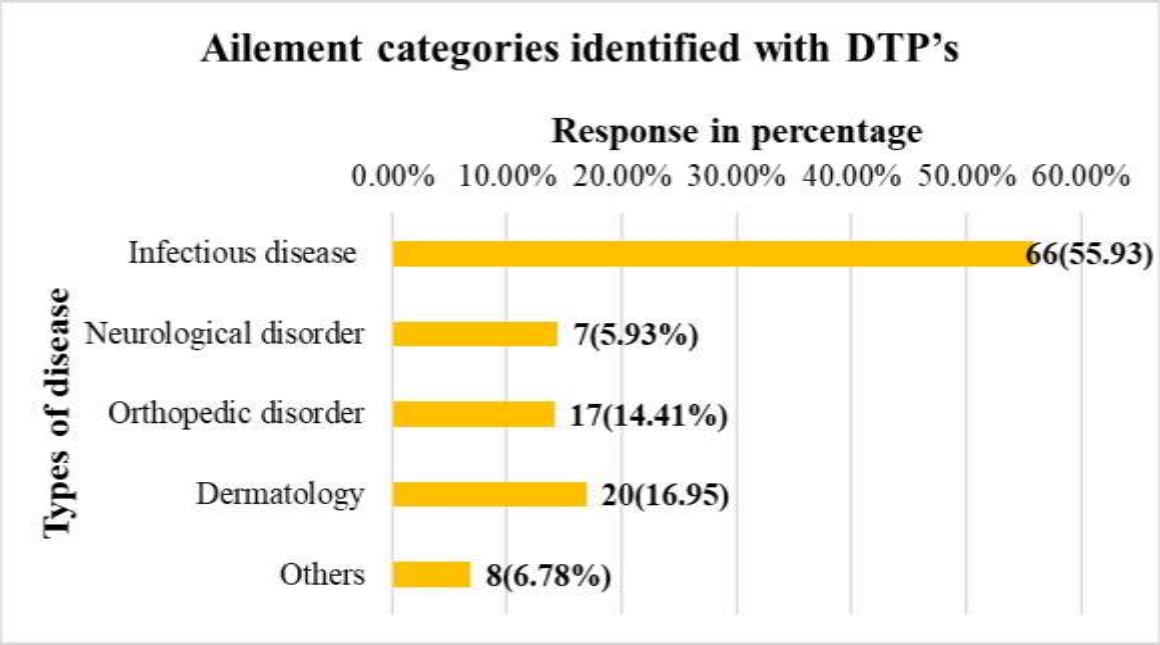

Figure 1: Ailment categories identified with DTP's.

DISTRIBUTION OF IDENTIFIED DTPs ACROSS DISEASES

In this study, it was found that DTPs were more commonly seen in Infectious disease and Dermatological disorders. The distribution of identified DTPs across various diseases is given in Table 3.

Table 3: Distribution of identified DTP's across various diseases.

Types of DTPs	Diagnosed diseases	Number of patients (n=116)
Need for additional therapy	LRTI Pityriasis Vesicolor URTI LRTI	2 1 2 2
Unnecessary therapy	URTI Mumps Vitamin B12 def. Anaemia Measles	2 2 2 2
Drug dose too high	Scarlet fever LRTI Nephrotic syndrome Seizure Juvenile arthritis De quervains tenosynovitis	5 6 2 5 2 1
Drug dose too low	Chicken pox URTI Gastric irritation Acute gastritis	6 3 1 1
Wrong drug	None	0
Adverse Drug Reactions	Chicken Pox URTI	3 1
Adherence problem	Others (minor injuries) Measles Scarlet fever Vitamin B12 def. Anaemia URTI LRTI De quervain's tenosynovitis Mumps Juvenile arthritis Seizure Chicken pox Cervical radiculopathy Urticaria	6 1 3 1 7 4 11 8 2 3 7 5 5

CLASS OF DRUGS INVOLVED IN DTP'S IN PAEDIATRIC PATIENTS

In the current study, it was found that drug categories such as Antibiotics, Analgesics and Antipyretics were more frequently involved in causing DTPs. The drug classes which frequently involved in causing DTPs in pediatrics are shown in Figure 2.

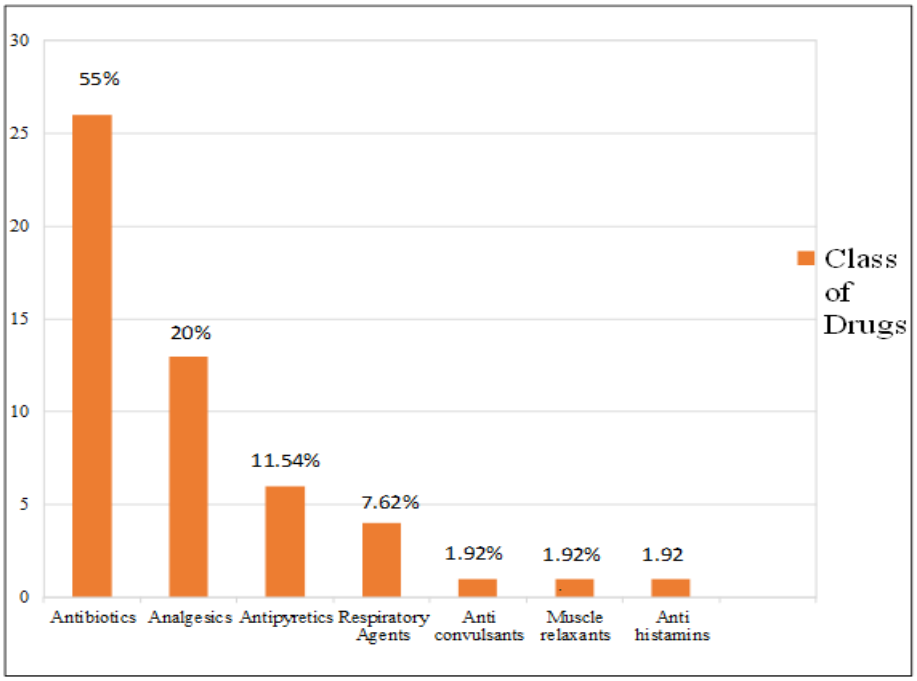

Figure 2: Class of drugs involved in DTP's in Paediatric patients.

DISCUSSION

In the present study, 150 Pediatric patients of either sex aged between 1 month-17 years, diagnosed with one or more diseases have participated. Out of 150 patients who participated in this study, 116 patients were found to have DTPs. A total of 118 DTP's was identified from 116 patients.[9]

In this study, the prevalence of DTPs showed no significant correlation with the increasing number of diseases present. Despite most subjects having a single illness, DTPs were still prevalent. However, the sample size may have influenced this finding. Regarding the number of drugs prescribed, subjects with DTPs were mostly prescribed 1-4 medications, but 14 out of 16 patients prescribed with more than 4 drugs had DTPs. This suggests that polypharmacy could be an independent predictor of DTPs, as indicated by the study's results.[10], Tsan yuk hospital[7], and Al Khasirah hospital revealed that polypharmacy was the predictor of DTPs in pediatrics.[11]

In this study, infectious diseases were the primary category of ailments linked to drug therapy problems (DTPs), with antibiotics being the most prevalent class of drugs associated with DTPs. This parallels findings from a study across four French-speaking countries. Conversely, research in Germany found antiepileptic and corticosteroid medications to be frequently implicated in DTP occurrence.[12]

In this study, unnecessary drug selection was observed, involving the prescription of medications not essential for the patient's medical condition. Out of 118 identified DTPs, 8 fell into this category. For instance, a patient received Syp. Tonoferon for folate deficiency despite normal folate levels, rendering the medication unnecessary. This led to adverse effects like bloating, prompting its withdrawal. Such prescriptions without valid medical indications increase the risk of DTPs in pediatric patients.

CONCLUSION

The study found that polypharmacy independently predicted DTPs, with infectious diseases being the primary category linked to them, and antibiotics being the major class of drugs associated with DTPs. Clinical pharmacists can significantly contribute to promoting better medication use in pediatric patients by ensuring appropriate medication selection, considering physiological factors, and addressing polypharmacy, thus minimizing the risk of potential drug therapy problems.

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