Innovative Journal of Medical and Healthcare Research (IJMHR)
Volume-2 Issue-1 January-2025

A Study On Clinical Pharmacy Intervention In Drug Therapy At A Tertiary Care Hospital

Shri. Manjunath.G. Gandage[1]

[1]Assistant Professor, Department of Pharmacy Practice. HKE Society's Matoshree Taradevi Rampure Institute Of Pharmaceutical Sciences Kalaburagi, India.

Deshmukh Shifa Anjum, Firdous Begum, Sushmita Biradar, Vereesh Biradar[2]

[2]Research Scholars, Department of Pharmacy Practice, HKE Society's Matoshree Taradevi Rampure Institute Of Pharmaceutical Sciences Kalaburagi, India.

ABSTRACT

As a branch of medicine, clinical pharmacy focusses on helping people lead healthier lives by reducing the risk of illness and maximising the effectiveness of their pharmaceutical regimen. Every healthcare system should prioritise improving patient safety. An essential part of any healthcare system is clinical pharmacy.
At a tertiary care hospital, researchers followed patients for six months as part of a prospective observational study. After carefully reviewing the study requirements, patients were recruited in the trial at random.
Over the course of six months, 150 medication records were examined as part of the research. There were a total of 99 drug-related problems, including 23 documented adverse drug reactions, 89 medication errors, 2 drug-lab interactions, 2 drug allergies, and 5 contraindications. There were 8 drug-drug interactions, 2 of which were mild, 4 of which were moderate, and 2 of which were serious. Throughout the course of the research, 22 patients were counselled on their conditions and the drugs they were taking. Five questions about drugs and five questions about poisons were fielded from the research site's doctors, nurses, and patients.
Substance abuse issues occurred often. When chemists collaborate with doctors as part of a patient's care team, the chemist is in a prime position to step in and help patients follow their prescribed treatment plans.

Keywords: Clinical Pharmacist, Drug Related Problems, Adverse Drug Reactions.

I.INTRODUCTION

As a branch of medicine, clinical pharmacy focusses on helping people lead healthier lives by reducing the risk of illness and maximising the effectiveness of their pharmaceutical regimen. Every healthcare system should prioritise improving patient safety. This entails maximising the efficacy and safety of medication usage while decreasing the occurrence of adverse drug events (ADEs). The goal of clinical pharmacy services is to help patients make informed decisions about their medication regimen in a way that maximises therapeutic efficacy while decreasing side effects, costs, risks, and disrespecting their autonomy. This may be achieved by the following activities: counselling patients and providers, taking medication histories, reviewing medications, attending ward rounds, making suggestions for drug selection and follow-up, and so on.

Patients at high risk for adverse drug events (ADEs) should be targeted in clinical pharmacy service implementation strategies, since they have a better chance of benefiting from these services. Because to polypharmacy, changed pharmacokinetics and pharmacodynamics, many concurrent diseases, and frequent inappropriate prescription, this includes elderly people. Hospital admission, hospital stay, and post-discharge periods are all potential times for suboptimal prescription and adverse drug reactions (ADRs). The effect of interdisciplinary teams including clinical chemists on medication-related outcomes for geriatric inpatients has only been examined in a small number of North American studies. It is not known if they are applicable to European contexts where clinical pharmacy is taking root.

Medication treatment includes the involvement of clinical chemists. The administration of medication in a controlled manner with the goal of improving a patient's health and well-being is known as pharmaceutical care. The rising complexity of medication treatment is making it more difficult to prescribe drugs appropriately. Even though the majority of medications have a very good safety record and good advantages. Drug-related problems (DRPs) are a major concern for patients since they have a negative impact on QOL, lead to more hospitalisations, and drive-up healthcare expenses generally. On the other hand, pharmaceutical treatment optimisation has the ability to impact healthcare costs, save lives, and improve patients' quality of life by avoiding DRPs. The act of a chemist recognising

a medication-related issue and offering a solution or prevention strategy is known as a clinical intervention.

1.1 Here are some ways medical therapies are classified:

1. Efforts have been made to change prescription practices in one particular location. Reducing the improper use of antibiotics, parenteral nutrition treatment, and other kinds of medications is achieved by the adoption of recommendations, especially when they are supported by personal visits. It is necessary to regularly assess the efficacy of such tailored therapies since their effects may be fleeting.
2. The term "reactive intervention," which may also be referred to as "pharmacist-initiated intervention," refers to the practice of providing unsolicited advise to a doctor about a potential change in medication, dosage, frequency, route, or other component of drug management.
3. As part of passive intervention, patients are informed about their medications and their potential side effects, dosage, administration method, drug interactions, and other important information. There is strong evidence of medication-related mistakes among hospitalised patients, according to many research done in industrialised nations. While there is a dearth of research on the frequency of drug-related issues in Indian hospitals, what little there is suggests that chemists may play an important role in improving patient care by lowering the incidence of medication mistakes and other complications.

II. History of Clinical Pharmacy:

In the early 1960s, the phrase "clinical pharmacy" was first used to describe the practice of hospital pharmacy in the US. It wasn't until 1953 that the phrase "clinical pharmacy" appeared. Two events in the 1960s laid the groundwork for clinical pharmacology. It was discovered in 1962 in the case of "The Thalidomide Tragedy" that the popular sedative thalidomide caused infants to be born with fused limbs. Secondly, in 1968, there was a report of phenytoin toxicity in Australia. This was due to changes in formulation, namely the use of lactose as an inert excipient in the tablets instead of calcium sulphate. The purpose of these alterations was to study the effects of alternative formulations on bioavailability, pharmacokinetics, and toxicity.

In the United States, clinical pharmacy was first developed. Earning a Pharm.D. degree led to a shift in curricular focus towards clinical practice. The field of pharmacy in the United Kingdom was affected by these changes. After the introduction of prescription and medication administration records, the use of pharmacies in hospital wards increased. The first clinical pharmacy master's degree programs were established in 1976. Clinical pharmacy in India has been through a sea shift in the last few years, with several encouraging developments. Clinical pharmacy is becoming so important that even hospitals have begun to recognise it and are making efforts to

2.1 Need for Clinical Pharmacy in India

The goal of clinical pharmacy is to improve patient outcomes while minimising risks and costs associated with medication treatment. One aspect of a chemist's work in a hospital setting is clinical pharmacy, although the phrase "pharmacy practice" encompasses much more. These include a wide range of activities, including as medication reviews, academic detailing, sterile and non-sterile manufacturing, health promotion, patient counselling, pharmacovigilance, and drug information and dispensing. Substance abuse is a major issue in India. There are a lot of political, medical, and socioeconomic factors at play here. Prescribers, patients, chemists, nurses, pharmaceutical companies, and governments all have a role in drug-related problems. By emphasising the need of both effective and safe medication usage, hospital-based clinical pharmacy practice may enhance the medication utilisation process. Because certain over-the-counter medications may interact with prescription ones, it is important for the clinical chemist to review the patient's medical history and current habits after getting a prescription. This contributes to precise and efficient medical treatment.

2.2 Current Indian scenario of drug interactions and its management

It is the responsibility of both the doctor and the chemist to inform patients of the potential for adverse effects and what to do in the event that they manifest. Thanks to their extensive understanding of pharmacology, chemists are able to connect patients' unusual symptoms to potential side effects of their medication. By avoiding medications with possible adverse effects in patients who are sensitive, clinical pharmacy practice also guarantees that ADRs are minimised. So, when it comes to detecting, preventing, and reporting adverse drug reactions, the chemist plays a crucial role. The majority of medications provide information about possible drug interactions in their prescription materials. It is possible that many of these interactions are insignificant, occur only under certain circumstances, or

are very infrequent. Most worrisome are medication interactions that significantly alter a medicine's effect. The majority of drug interactions are complicated and difficult to anticipate. Not every person will experience a known encounter. Reason being, the probability of medication interactions is affected by a number of variables. One of these variables is the fact that people vary in their:
Genes

- Physiology
- Age
- Lifestyle
- Underlying diseases
- Drug doses
- Duration of combined therapy
- Relative time of administration of the two medications

It is important to check with your primary care physician or chemist before beginning the use of any new medication, whether it is over-the-counter or prescribed. Verify that you have read the patient information. Before taking any drug, read the label carefully for any cautions or Drug Interaction Precaution. Take the time to read these cautions. Jot down everything you take, whether it's a prescription pill, an over-the-counter remedy, a vitamin, or a supplement. Talk to your chemist and all of your doctors about this list. If you can, fill all of your prescription and over-the-counter prescriptions at the same drugstore.

2.3 Drug Therapy Related Problems, Pharmaceutical Care And Community Pharmacists

• More than a quarter of American adults use five or more medicines (including vitamins, herbal remedies, and over-the-counter prescriptions) per week.
• Post-marketing monitoring, high-standard epidemiology institutions, and a plethora of scholarly journals have all emerged as responses to issues with drug treatment.
• The release of the study paper, "To err is human," by the US Institute of Medicine, brought considerable attention to the problem of patient safety and medical blunders. Working for a more secure healthcare system.
• Intrinsic issues (such as adverse drug responses, medication mistakes, and intolerabilities) include the medicine's efficacy and safety, the medicine's availability in a certain dose form, and the third category, "extrinsic difficulties," which pertain to drug treatment.
• Open lines of communication between patients and chemists are vital in avoiding these issues, but automation also plays an important role.
When it comes to issues with medication treatment, community pharmacies may be a huge assistance.
• Studies on chemists' approaches to drug therapy-related issues have been begun in response to the growing knowledge of these challenges.
Pharmacists have an important role in identifying and mitigating the effects of issues associated to medication treatment, according to observational studies.
• Although not always routinely, new responsibilities including drug treatment meetings, medication monitoring and counselling, and patient education are carried out in practice.

2.4 Clinical Risk Management, A Complementary Approach

The issue is whether pharmaceutical care can solve the systemic problem of medication mistakes and adverse effects. Although a wide definition and operationalisation of pharmaceutical care exist, the chemist's job has been reengineered to concentrate on the patient. Pharmacy practice and education have altered. Competencies now focus on evidence and lucrative patient-prescriber relationships. However, society still faces a high rate of health care and medication mistakes, adverse occurrences, and other issues. Some report an increase in medication mistakes. One seeks alternate solutions to these issues. Risk management is being incorporated into healthcare based on studies in safety-critical sectors like aviation and oil and gas. Accidents in flight are very noticeable. Aviation has standardised inquiry, documentation, and dissemination of mistakes and learning. This notion emphasises a systems approach that acknowledges technology limits. The premise is that medical mistakes result from systemic problems in the health care system, not individual carelessness. Clinical risk management promotes organisational integrity over vulnerability. It accepts mistakes and encourages incident reporting to provide accurate data on errors at the start and throughout the process.

Evaluating, managing, and assessing risks are all part of clinical risk management. Phase one entails cataloguing potential threats, stage two entails rating them, and stage three entails developing and implementing operational measures to mitigate such risks. Evaluation of the efficiency and effectiveness of risk treatment methods is the most critical component. Particularly for Medicare recipients and those taking several prescriptions, the potential of drug-drug interactions (DDIs) is a worry for both patients and doctors. Patients at risk for DDIs rely heavily on clinical chemists to oversee their pharmaceutical administration. When it comes to managing drug treatment and alleviating anxiety associated with taking several medications, trusting clinical chemists is crucial. A patient's level of confidence in their clinical pharmacist is an all-encompassing concept. But trust is hard to get back when it's been damaged. Patients who are at risk for drug-related complications are not eager to use clinical chemists' medication management services, according to the research. Clinical chemists may assist decrease DDI risk and boost confidence by offering professional expertise and consulting.

III. OBJECTIVES

General objective: Research on the clinical chemist intervention programs offered by a major medical centre.

Specific objective:

- In order to categorise and respond to the different drug information requests (DIQ).
- Therapy for patients about their health, disease, and eating habits
- We need to classify possible drug mistakes according to when they occur, what causes them, and how bad they are, and then respond accordingly.
- In order to detect, track, and report on a wide range of adverse drug reactions (ADRs).
- Drug allergies, contraindications, drug duplication, and drug interactions are some of the drug-related problems that need to be identified.
- For the purpose of evaluating medication selection, proper dosing, and treatment duration

IV. REVIEW OF LITERATURE

Jimmy O.D et al performed research on medication interactions by reviewing patient records at a tertiary care hospital's medicine ward. The results demonstrate that the study's primary objective was to examine patients' prescription records for evidence of drug-drug interactions. We used drug information sites such drugs.com and Thomson Reuters MICROMEDEX 2.0 DRUGDEX to analyse drug-drug interactions in all patients admitted to the Female Medical Ward and MICU. Out of 230 instances that were gathered, 120 (52.17% of the total) were found to have 330 DDIS; 10 (3.03%) of these were clinically seen, while the remaining 320 were considered to have potential DDIS. The pharmacodynamics-related potential DDIS constituted the vast majority (80.86%). Of the 330 DDIS that were found, 82 (or 24.85%) were quite serious, 176 (53.33%) were rather serious, and 72 (21.82%) were not too serious. In 35% of the prescriptions, at least one possible DDI was found. Although DDIs may not seem to pose a significant threat to patient health or the efficacy of pharmacological treatment, this research concludes that more clinical studies are necessary to determine the true consequences of DDIs.[1]

Himanshu P et al conducted research at a tertiary care hospital on pharmaceuticals and therapeutic information services offered by clinical chemists to enhance patient care. The Department of Clinical Pharmacy electronically documents all DI enquiries handled. A quality evaluation panel, made up of senior clinical pharmacists, was formed to evaluate DI service quality; a quality assessment checklist was then created and used for this purpose. We got 1,204 DI requests in all. During ward visits, clinical pharmacists received the vast majority of DI enquiries (46.76%), with 61% of those enquiries pertaining to improved patient care. Postgraduate medical students got 48% of the questions, followed by doctors (16%) and interns (8%). medication interactions (6.48%), dosage/administration (22%), adverse medication responses (8%), drug usage during pregnancy/lactation (7.56%), and cancer chemotherapy dose (15.70%) were the most frequently asked questions about DI. The Department of Medicine received 26 percent of the total enquiries, with the Surgery Department coming in at 19.35%, the Paediatrics Department at 15.61%, and the Dermatology Department at 8.47%. Nearly all of the questions had instant responses (64%). Sixty-4.5 percent of the queries were considered to have exceptional quality, 35.6 percent were considered good, and 3.5 percent were determined to be DI questions that needed improvement based on the quality evaluation criteria. It is evident from the ranking that the DI service was deemed good in terms of quality.

Anne S et al investigated the feasibility of tertiary care hospital ward-based clinical pharmacy services. Over the

course of seven months, a clinical chemist who was educated in interventional care administered pharmaceuticals to 101 patients hospitalised to an acute geriatric ward. The patients' mean age was 82.2 years, and their mean SD number of prescription medications was 7.8 3.5. We documented all strategies to improve prescription and how well they were received. Clinical significance of the therapies was evaluated by an external panel consisting of two geriatricians and one clinical chemist. We used phone calls to see how long the treatments lasted after patients were discharged. In all, 1,066 interventions were carried out throughout the course of the seven months. The most common drug-related issues that led to interventions were improper dosage (11.9%), improper treatment duration (9.7%), and incorrect pharmaceutical choice (9.6%). medication discontinuation (24.5%), medication addition (18.6%), and dose adjustment (13.7%) were the most common outcomes. A whopping 87.8% of doctors were on board with it. In terms of therapeutic effect, 68.3% of treatments had moderate importance and 28.6% had substantial relevance. By the third month after release, 84% of patients had maintained their chronic therapy adjustments. Conclusion: a geriatric team that included a clinical chemist was able to optimise medication usage in a way that was both clinically relevant and widely acceptable. Additional expansion of clinical pharmacy services could emerge from this endeavour.

Simran p et al investigated the possibility of medication interactions in the paediatric ward of a tertiary care hospital. Results from a prospective, observational research that ran for five months in a tertiary care hospital's paediatric ward are presented in the paper. The data was documented by the lead investigator using pre-tested case record form, which was culled from hospital case documents. Each patient's prescription drugs were evaluated with the use of Lexicomp, a free, web-based program that predicts PDDIS (version 4.4.0). The program classified DDIs as small, moderate, or large based on their severity. Interviews with patients or carers were also conducted by the investigator when deemed essential. In all, 300 patients were a part of the research. There were 157 males and 143 females, or 52.3% and 48.2%, respectively. Out of a total of 235 PDDIS, or 78%, 3 (or 1.2%) were significant DDIS and 227 (or 97%) were minor. Ondansetron and paracetamol had the highest frequency of drug-drug interactions (224). Both the ondansetron and phenytoin and the ondansetron and dextromethorphan (2) combinations showed signs of a possible serious DDIS. Ondansetron and paracetamol were shown to cause the most frequent and mild DDIs, according to the research. None of the clinical DDIs were found. Although not all patients with moderate or large DDIs had clinical symptoms, it is nevertheless prudent to take necessary measures to prevent any negative outcomes.

Kandavalli S et al performed research on the function of clinical chemists at tertiary care hospitals with regard to medication error management and drug information services. According to the research, a tertiary care hospital conducted a prospective analysis over the course of six months. We have contacted with healthcare professionals directly and used question boxes to gather their enquiries. Out of 108 questions asked in the prospective study, 31 were found to be pharmaceutical mistakes; of these, almost 65% were corrected, 25% were accepted but could not be corrected since prescribers had already provided an explanation, and 10% were not considered an error at all. Only 3% of requesters were given suggestions on how to enhance the quality, whereas 49% were given excellent feedback. There is a huge scope for future development with the engagement of additional healthcare experts, and it was discovered that the medication information service is highly accepted in terms of quality.

V. MATERIALS AND METHODS:

Source of data:
Patient records from tertiary care hospitals' orthopaedic, paediatric, surgical, and medicine departments
Method and collection of data:
Study site:
The research will take place in a highly specialised hospital. Research timeframe: Six months will pass throughout the course of the research.
Study design:
— "A research that aims to observe throughout time" Patients will be included in the trial when they meet the study's eligibility requirements.

- **Inclusion criteria:**
  - In Patients are included in the study.
  - Patients of either gender.
  - Patients of any age group were included in the study.

- **Exclusion criteria:**
  - Patients who are not willing to participate in the study.
  - Out-patient are excluded from the study.
  - Psychiatric patients are excluded from the study.

Case study procedure: A tertiary care hospital will conduct a 6-month prospective observational research. After carefully reviewing the study requirements, patients admitted to the hospital will be recruited in the research at random. Each patient will be asked to provide their informed agreement or assent when they are enrolled in the trial. The patient data collecting form will be appropriately designed to capture demographic and pharmaceutical details taken from the case sheets. Ward rounds will be attended by the clinical pharmacist. We will carefully examine the patient's medication record and make note of any issues linked to drugs.

VI. RESULTS

A tertiary care hospital will conduct a 6-month prospective observational research. After carefully reviewing the study requirements, patients admitted to the hospital will be recruited in the research at random. Each patient will be asked to provide their informed agreement or assent when they are enrolled in the trial. The patient data collecting form will be appropriately designed to capture demographic and pharmaceutical details taken from the case sheets. Ward rounds will be attended by the clinical pharmacist. We will carefully examine the patient's medication record and make note of any issues linked to drugs.

Table No. 1: Clinical Pharmacy Services

Clinical pharmacy Services	Number of cases	Percentage
Adverse Drug Reactions	10	6.70%
Drug Related Problems **Drug – Drug Interactions**	98 08	65.33% 5.36%
Patient counselling	24	16.00%
Drug and Poison Information Queries	10	6.70%
Total	150	100%

AGE AND GENDER WISE DISTRIBUTION OF ADRs:

Of the 150 prescription charts that were reviewed, a total of 15 adverse drug reactions (ADRs) were identified. Of these, 3 were male (30%) and 7 were female (70%). Over 60-year-olds accounted for the vast majority of ADRs (80%). Table No.2 has the information.

Table No.2: AGE AND GENDER-WISE DISTRIBUTION OF ADRs

Age(years)	Gender		Adverse Reaction	
	Male	**Female**	**No. of ADRs**	**% ADRs**
10-19	0	0	0	

20-29	0	0	0	
30-39	0	0	0	
40-49	02	0	02	20%
50-59	0	0	0	
>60	01	07	08	80%
Total	**03**	**07**	**10**	100%
Male			03	
Female			07	
Total			10	100%

THERAPEUTIC CLASS WISE DISTRIBUTION OF ADRs

The classes of drugs causing ADR includes anticonvulsant, diuretics, corticosteroids,anti-tubercular, sulfonamides, aniline analgesics, NSAIDs and amino glycosides.

Table No. 3: THERAPEUTIC CLASS WISE DISTRIBUTION OF ADRs:

	DRUG	**CLASS OF DRUG**	**ADVERSE DRUG REACTION**
	Norad	Antihypotensives	Headache, insomnia
	Novastat 10 mg	Statins	Abdominal pain ,headache, nausea,weakness
	Amaryl 1 mg	Sulfonylureas	Itching, rash, dizziness
	Rcifax 40mg	Antibacterial	Fever
	c-tri 1gm	Antibiotics	Rashes

	AD 100	Antidiarrheal	Headache , redness
	Clopidogrel 75 mg	Antiplatelet	Gastritis
	Rosuvastatin 20 mg	Statins	Muscle pain, tenderness, cramps
	Aspirin 25 mg	NSAIDs	Gastritis
	Norad	Antihypotensives	eadache, insomnia
	Hyponat	Vasopressinantagonists	Dry mouth , increase urine frequency
	Albumin		Dizziness
	Tramadol 1amp	Opiate analgesics	Shallow breathing
	Taxim 1g	Antibiotics	Rashes, nausea ,vomiting
	Azithromycin	Antibiotics	Irregular heartbeat
	Nova	Anticonvulsants	Anxiety , fatigue
	C - tri	Antibiotics	Rashes
	Vitamin k	Fat soluble vitamin	Dizziness
	Claribid	Antibiotics	Headache , difficulty in sleeping
	Noard	Antihypotensives	Headache , insomnia
	Sumol	Antipyretics	Stomach pain
	Sodium bicarbonate	Alkalinizing agents	Muscle pain , headache
	Taxim	Antibiotics	Rashes

Table No.4: ORGAN / SYSTEMS AFFECTED BY THE ADRs

	ORGAN	NO. OF CASES
	Skin	05
	Gastro Intestinal	02
	Endocrine	02
	Hepatic	02
	Kidney	03
	CNS	07
	Muscoskeletal	02
	Others	
Total		**23**

PATTERN OF OUTCOME OF ADRs

The outcome of ADRs obtained includes Improved 70%, Not known 30% and Deathdue to ADRs 0%.

Table No. 5: PATTERN OF OUTCOME OF ADRs

	Outcomes of ADRs	**No. of Cases**	**%ADRs**
	Improved	07	70%
	Not Known	03	30%
	Death due to ADR	-Nil-	0%

MANAGEMENT OF ADR

For the management of ADR, 60% of drug is withdrawn, 20% of dose is altered and20% of the dose is changed.

Table No.6: MANAGEMENT OF ADR

S.NO	Management of ADRs	No. of ADRs	%ADR
01	Drug Withdrawn	06	60%
02	Dose Altered	02	20%
03	Change of Dose	02	20%

Severity of ADRs (hart wig's severity assessment scale)

Hartwig's severity assessment showed majority of cases as Mild 6 (60%),Moderate 2 (20%) and Severe 2 (20%). Details are given in Table No. 7

Table No. 7: Severity of ADRs (hart wig's severity assessment scale)

SEVERITY	TOTAL CASES	%ADRs
MILD	06	60%
MODERATE	02	20%
SEVERE	02	20%

VII. DISCUSSION

The optimisation of drug treatment and the reduction of drug-related problems (DRPs)—which may cause higher costs, morbidity, and mortality—are critically impacted by clinical pharmacy services. The purpose of this research was to evaluate the clinical chemist interventions and clinician comments in a tertiary care hospital's wards. The chemist counselled patients, checked prescription records and took part in ward visits. Patients older than 60 years old had the greatest frequency of adverse drug responses (10 out of 150 prescription records examined).

Researchers concluded that carbamazepine-induced Stevens-Johnson syndrome was the most serious adverse drug reaction (ADR). The epidermis, endocrine glands, gastrointestinal tract, skeletal muscles, central nervous system, liver, and kidneys were the organs most profoundly impacted. Inappropriate antibiotic usage, bacterial resistance, and drug-drug interactions were among the 89 prescription mistakes found throughout the study.

Here are some examples of drug-drug interactions that the chemist found and reported: tramadol with ondansetron, aspirin with clopidogrel, alprazolam with tramadol, atorvastatin with clopidogrel, glimepiride with clarithromycin, and ofloxacin with metformin. The liver and kidneys were damaged as a result of these interactions.

At the bedside, the chemist counselled 24 in-patients as part of their healthcare team, offering advice on medication, improved disease management, and lifestyle modifications. Most of the questions were about drug profiles, and we used all of our resources—primary, secondary, and tertiary—to get answers.

The research found that organophosphate pesticides were the leading cause of poisoning, which might be because they are widely available in the area. The antidote for organophosphate poisoning is atropine.

VII. CONCLUSION

As an integral part of the healthcare team, clinical chemists work together with doctors to increase the likelihood that patients will follow their prescribed treatment plans. A chemist's job has grown in importance in recent years as the prevalence of various diseases has increased, necessitating the prescription of enormous amounts of medications. However, there have been several cases of improper drug use, which has contributed to the proliferation of drug-related problems.

The research found that there were greater cases of medication-related problems at the location where clinical chemists are most needed to detect and prevent these issues.

REFERENCES

1. Anne Spinewine, Implementation of Ward-Based Clinical Pharmacy Services in Belgium—Description of the Impact on a Geriatric Unit, April 2006, The Annals of Pharmacotherapy,720-721.
2. Siraj Sundaran, ASSESSMENT OF CLINICAL PHARMACIST INTERVENTION IN A TERTIARY CARE HOSPITAL IN CALICUT, October 2020, ejpmr, 2020,7(11), 523-526.
3. SATISH KUMAR BP, ASSESSMENT OF CLINICAL PHARMACIST INTERVENTION IN TERTIARY CARE TEACHING HOSPITAL OF SOUTHERN INDIA, March 2013, Asian J Pharm Clin Res, Vol 6, Suppl 2, 2013, 258-26.
4. SOODABEH KANAFILESKOOKALAYEH, Prescribing Pattern and Pharmacist Intervention in Anticoagulation at A Tertiary Care Teaching Hospital, Coimbatore, India, MAY 2021, P J M H S Vol. 15, NO. 5,1290-1291.
5. Kandavalli Sridevi, Clinical Pharmacist Role in Drug Information Services and Medication Errors Management at Tertiary Care Hospital, June. 2017, June. 2017, IOSR Journal of Dental and Medical Sciences (IOSR-JDMS) e-ISSN: 2279-0853, p-ISSN: 2279-0861.Volume 16, Issue 6 Ver. XI (June. 2017), PP 16-23.
6. Shahin Mojra, A prospective study on impact of clinical pharmacist interventions in management of patients with cardiovascular diseases in a tertiary care hospital, India,2022, ACADEMIC Journal of health science,2022/37(1):110-117.
7. Assessment Of Knowledge And Prevalence Of Risk Factors Of Pregnancy Induced Diabetes Mellitus Among Pregnant Women At A Teaching Hospital. (2025). *Innovative Journal of Medical and Healthcare Research*, *2*(1), 1-16. https://doi.org/10.61808/ijmhr17
8. Colour Doppler Ultrasound Evaluation Of Umbilical Artery And Middle Cerebral Artery In Suspected IUGR Fetuses. (2025). *Innovative Journal of Medical and Healthcare Research*, *2*(1), 17-33. https://doi.org/10.61808/ijmhr18