

## Research Article



## A Prospective Observational Study on Therapeutic Duplication and its Outcome in a Tertiary Care Hospital, India.

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### ABSTRACT

Therapeutic Duplication (TD) leads to significant economic loss, increased morbidity and mortality. To explore and estimate the frequency of duplication error at the time of prescription of medications, a study was conducted in a Tertiary Care Hospital, Kolkata, India. The purpose of this study is to determine the prevalence and nature of TD; also to explore the causes and to identify defense against duplication error. This is a prospective observational study which was conducted for the period of four months (June, 2016 to September, 2016). Incidence of TD was collected and documented by Clinical Pharmacist by reviewing medication cards of 636 patients admitted to ward and intensive care unit. The duplication errors were detected to be 15% in the month of June and it increased to 40% in month of September, considering total numbers of error in 4 months. PANTOPRAZOLE was found to be a most common drug involved in duplication error among all drugs prescribed. The reason was found to be inadequate knowledge about brand names, inattention during daily rounds. TD is not uncommon in clinical practice, more so in intensive care. Proper knowledge of different brand names of same drugs, proper attention by in-house physicians, nurses during daily rounds and daily review of medication card by clinical pharmacists have been proposed to decrease TD by our study. We will conduct another study to show efficacy of above three measures to decrease TD.

**Keywords:** Therapeutic duplication, Medication error, prescription error, Adverse drug reactions.

### INTRODUCTION

Therapeutic Duplication is the practice of prescribing multiple medications of similar groups for the same indication or purpose without a clear distinction of when one agent should be administered over another. For example, prescribing Pantoprazole and Ranitidine for acid peptic disorder. It mostly occurs due to use of multiple drug therapy (Poly Pharmacy) along with different brand name. For Example - Prescribed Tab. Atorva 10 and Tab. Storvas 10, both contains Atorvastatin.<sup>1</sup> It increases the risk of adverse drug reactions without additional therapeutic benefits.<sup>2</sup>

Therapeutic duplication is one of the most vital Drug therapy problems (DTP) in health care system. DTP is a categorization of drug problems in the field of pharmaceutical care that happens between physicians, pharmacists and patients. These problems are then identified, prevented, and resolved primarily by clinical pharmacists, but it can be taken care of by any health-care provider that provides pharmaceutical care.<sup>3</sup>

### MATERIALS AND METHODS

#### Study Objective

##### Primary Objective

To determine the incidence, the percentage of TD of drugs per month, types of drugs involved in TD in a tertiary care hospital.

##### Secondary Objective

To find out cause of TD.

#### Study Designing

It is a prospective study in which patients admitted and receiving medication during hospital stay were included. The technique which has been used to identify the duplication errors was: Daily review of medication card by clinical Pharmacist.

#### Source of Data

The study was carried out in a 500 bedded Tertiary Care Hospital in Kolkata. Patients admitted in intensive care unit were also included.



**Time duration of the study**

June 2016 –September 2016 (4 months)

**Study Criteria**

The study had following criteria:

Inclusion Criteria: Patients admitted in ward and intensive care unit.

Exclusion Criteria: OPD patients, patients admitted in Hemodialysis Units were not included for this study.

**Methodology**

The study was conducted after getting approval from the hospital Ethics committee. The duplication errors were detected and analyzed prospectively over a period of four months (June 2016 –September 2016) . Specially trained clinical pharmacists daily reviewed medication card of 636 patients, admitted in different wards and intensive care units, they reported incidents of therapeutic duplication , if any, to the concerned doctor/ Clinical pharmacologist for corrective measures and also to the lead investigator of the study for documentation and analysis of Data. All raw data were documented electronic database for further analysis (MS EXCEL 2010)

**RESULTS**

In this study 636 Patient's data of a tertiary care teaching hospital were accumulated in which 330(51%) were male patients and 318(49%) were female patients. [Table 1]. Of gross duplication errors (8 out of 20) [Table 2], the month of June was found to have the least (15%) whereas

September was found to have the most (40%) number of duplication errors compare to other 3 months [Diagram 1]. The data were structured in a qualitative form. Duplication errors were expressed as actual numbers or in percentages. Pantoprazole, lorazepam, ondansetron and domperidone, amlodipine, amoxicillin, montelukast, atorvastatin, tramadol, calcium and vitamins were the most common drugs which were perceived with a therapeutic duplication. Pantoprazole was found to have the maximum number of therapeutic duplication, [Diagram 1] whereas lorazepam, ondansetron and tramadol were also involved in significant number of cases [Table 3].

**Table 1:** Gender wise distribution of total study population

GENDER	No Of Patients	% Found
MALE	318	49%
FEMALE	330	51%
TOTAL	636	100%

**Table 2:** Number of Duplication Error found for the month of June to September, 2016

Number of Duplication Error found for the month of June to September, 2016				
June, 2016	July, 2016	August, 2016	September, 2016	TOTAL
3	5	4	8	20

**Table 3:** Therapeutic duplication of each drug in comparison with total no. of duplication error found

Sr. No	Name of Drug	No. Of Duplication Case	Total No. Of Duplication	% of Duplication comparing with total no.
1	Pantoprazole	7	20	35%
2	Lorazepam	3	20	15%
3	Ondansetron and Domperidone	2	20	10%
4	Amlodipin	1	20	5%
5	Amoxicilline	1	20	5%
6	Montelukast	1	20	5%
7	Atorvastatin	2	20	10%
8	Tramadol	2	20	10%
9	Calcium and Vitamins	1	20	5%

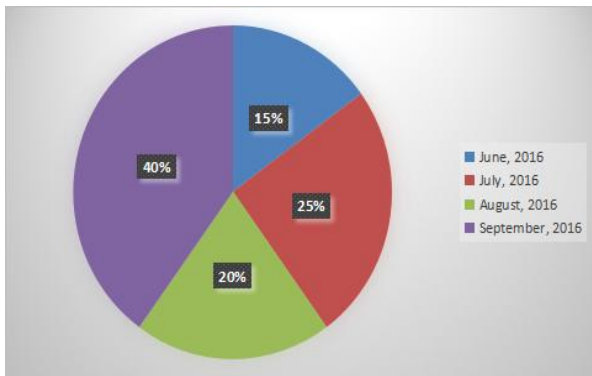
The study also involved estimation of therapeutic duplication among total inpatients prescription (medication card) with the corresponding percentage calculation of therapeutic duplication found per month.

**Percentage of Therapeutic Duplication found/ month =**  

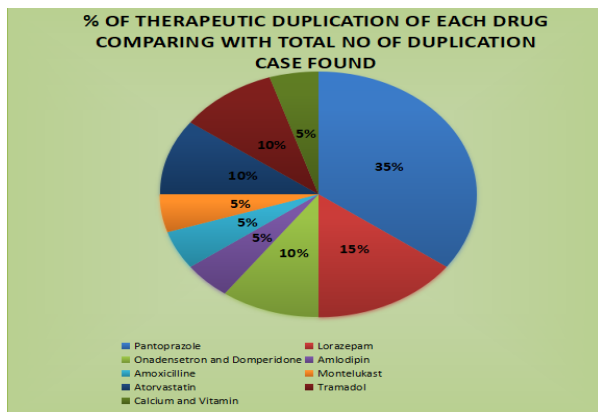
$$\frac{\text{Total no of duplication found} / \text{total no. of Inpatients Prescription (Medication card) issued on that month} \times 100}{}$$

The total number of inpatients were found to be 160,158,173 and 157 in June, July, August and September respectively. Therapeutic duplication were found to be 15%, 26 %, 18%, and 41% in June, July, August and September respectively comparing with total prescription issued for in-patients per month [Diagram 3]

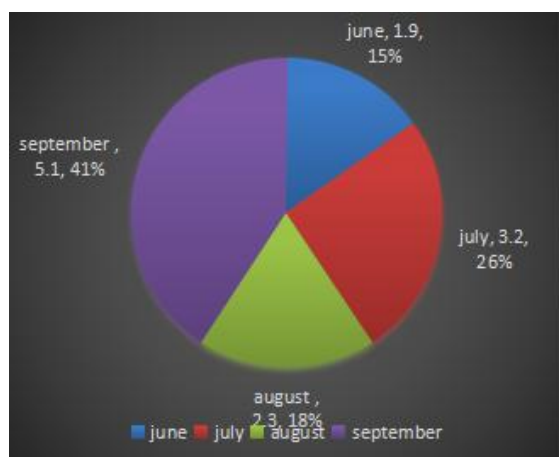




**Diagram 1:** The description of the occurrence of the duplication error (%) from month of June to September, 2016 comparing total duplication found



**Diagram 2:** Description of the Therapeutic duplication of each drug comparing with total no of duplication case found



**Diagram 3:** The description of the occurrence of the duplication error comparing with no of prescription issued for in-patients

## DISCUSSION AND CONCLUSION

This study concludes with a flow of increased duplication error. Early detection and timely correction of the duplication error is a requisite to improve the quality of patient care and to ameliorate patient safety.

pantoprazole, one of the most common drugs involved in TD has been persistently made liable for the day to day increase in TD accompanied with recurrent use of PPIs with different brand names. The study also enforced the need for development and establishment of drug protocols and medication policy in the hospital. It also shows the obligation of having clinical pharmacists in a hospital with intensive care unit to conduct a regular review of the medication card. The reason of TD was found to be inadequate knowledge about brand names and negligence during daily rounds. For example- A patient was administered with Inj Pantoprazole from past few days as per prescription, but in a certain date the senior doctor instructed to interchange the Injection with Tablet Pantoprazole, but the junior/in-house doctor forgot to write STOP/OMIT Inj Pantoprazole. As a result the patient started getting both Injection as well as tablet of the same drug. On the other hand, a senior doctor instructed an in-house doctor to start PPI and domperidone combination (eg. Cap. Raciper-D) for a patient who was administered with Tablet Pantoprazole (eg Pantocid). Due to negligence or inadequate knowledge, the junior doctor started the later without discontinuing the former. Duplication errors had to be corrected on spot by informing the concerned doctor.

To conclude, most of the TDs are mandible. In this study, the duplication error was handled meticulously by giving proper information, training and counseling to the concerned authority. Root cause Analysis was a very important aspect in controlling the duplication error. Intervention approach should be a primary focus on education and creation of a safe and interactive working environment which will help to minimize patient suffering<sup>2</sup>. Interventions structure helps to improve knowledge, training, reduction of complexity, introducing of strict feedback control and highly advisable monitoring systems. Especially in countries like INDIA, the problem of therapeutic duplication can be reduced by introducing clinical pharmacy practice in modern health-care system to implement regular prescription audit by experienced clinical pharmacists or clinical pharmacologists.

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