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Investigation of Poly Pharmacy at St.Philomena's Hospital, Bangalore, India

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Abstract

Objective: The study was designed to study the extent of polypharmacy among the prescriptions received at Out Patient pharmacy in St. Philomena's Hospital, to identify the common class of drugs prescribed in polypharmacy prescription, to identify the drug interactions among the prescribed drugs, to identify the various therapeutic classes involved in major drug interactions. Methodology: A prospective hospital based observational study was carried out in the outpatient department of St. Philomena's hospital. The research student, collected all the prescriptions received at OP pharmacy. All the prescriptions were carefully analyzed for polypharmacy and the data were pooled and analyzed. Result: A total number of200 polyphonic prescriptions were found in the out-patient pharmacy of St. Philomena's Hospital. During the study period of 6 months, it was found that the majority of the prescriptions were prescribed to female 101(50.50%) and 99(49.50%) were prescribed to male. Among 200 prescriptions it was found that 134(67%) contain 5 drugs followed by 42(21%) contain 6 drugs, 15(7.50%) contain 7 drugs and 9(4.50%) contain more than drugs. The most common therapeutic class was found to be Analgesics pertaining to 122(61%) drugs followed by antibiotics, which were 65(32.50%) drugs and 55(27.50%) drugs were Vitamins. It was found that the majority of polypharmacy's have been occurred in the age group of adults 113(56.50%) patients followed by neonates and infants 52(26%) patients and geriatrics 19(9.50%) patients. Among 200 prescriptions, 82 drug interactions were observed which were found to be 43(52.43%) major followed by36 (43.90%) moderate and3 (3.65%) minor. Among the Major interactions, anti-inflammatory drugs were found to be the most commonly participating therapeutic class of drug in interactions. Conclusion: only 10% of prescriptions were found to have polypharmacy which was commonly observed in female patients. Among polypharmacy prescriptions less than 50% had drug interactions, majority of which were major drug interactions.

Key words: Polypharmacy, Prescription Pattern, Drug Interactions

Introduction

Polypharmacy can be characterized as the utilization of numerous prescriptions for the treatment of a patient's ailments. The term polypharmacy proposes that more drug is being utilized than is clinically indicated. The number of meds taken by a patient that constitutes polypharmacy has not been defined. There are few explanations for poly pharmacy: (Wilson, 2010)

- As the population ages, polypharmacy increments. The old frequently requires different drugs to treat various health-related conditions.
- Patients with different co-morbid medical conditions likewise require various drugs to treat each condition. It isn't irrational for patients with different comorbid medical conditions to be on 6 to 9 medications decrease his or her long haul hazard for those conditions, i.e, diabetes complexities and coronary occasions.
- A recent hospitalization likewise puts you at risk of polypharmacy. Medications are begun and ceased every now and again amid your hospital stay.
- Multiple doctors are prescribing medications for the same patient. Once a patient starts a medication, it is never discontinued.
- Doctor changes from one med to another within the same therapeutic class; but the patient doesn't stop taking the first med. For instance: You are taking Protonix 40mg and Dr. gives you a remedy for Prevacid 30mg. Both of these medications are in a similar helpful class "Proton Pump Inhibitors" and work a similar way. Nobody ought to be on both these drugs. Physician recommended drugs changing to over-the-counter (OTC) status is another issue territory in this helpful class. A patient may take Prilosec (OTC) and get a content for Protonix, Prevacid, etc. This is the reason it is important to the point that you take every one of the drugs you take all the time with you when you go to the doctor.
- Doctors likewise may have a patient on a brand name medicate and compose the following medicine for a generic drug. Example: A patient is taking Coumadin 5mg every day; the Doctor gives patient a prescription for Jantoven 5mg, another tradename for Coumadin. The patient keeps on taking both not understanding they are a similar medication. This could have

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decimating consequences.

In an effort to cut costs, patients fill prescriptions at a few drug stores. Once you choose the most cost-effective pharmacy, stick to one pharmacy. One would have a total rundown of every one of your medications to more readily illuminate you of duplications, interactions, etc. Lack of patient training is the most widely recognized reason. Doctors don't inform patients or patients do not ask questions.

The most widely recognized intercession in polypharmacy patients is de prescribing, which includes distinguishing proof and discontinuance of prescriptions when the advantage never again exceeds the harm. In old patients, this should usually be possible as a patient winds up frailer and treatment concentrate needs to move from preventative to palliative. (Nobili et al., 2011; Zarowitz et al., 2005)

a noteworthy explanation behind polypharmacy is that a patient has numerous existing together ailments accepting treatment. In addition, in the case of diseases such as heart failure and high blood pressure, combinations of two to three different medications are common and recommended. If medications for symptomatic relief are added, it is easy to see why patients end up with a large number of medications. Once in a while a new medication is prescribed to treat the adverse effects of another medication, regularly when halting or changing the portion of the culpable medication would solve the problem. (Wilson, 2010)

The significant result of polypharmacy to a patient is a lot higher risk of adverse drug effects. This risk increments dependent on the quantity of medications prescribed and taken. These adverse drug effects often require physician contacts and, in some cases, emergency room visits or hospitalizations. Moreover, if an adverse effect emerges, it very well may be exceptionally hard to make sense of which of the numerous medications is the reason. Another conceivable issue is what is alluded to as medicine or drug interactions, meaning that the effects of one medication, favourable or unfavourable, may change whenever given together with another prescription. In this manner, taking at least five drugs leaves numerous opportunities for such interactions. The knowledge of medication interactions gained during the drug development phase is often limited due to incomplete testing. (Najjar et al., 2010; Moriarty et al., 2015)

In general, polypharmacy has direct impact on patient outcome and wellbeing. Healthcare professionals should be aware of the incidence and consequences of polypharmacy within their patients. This study is focusing to investigate various aspects of polypharmacy in our patients.

Materials and Methods

The research student was visited to the outpatient pharmacy at St. Philomena's Hospital on a daily basis and was go through the prescription, if polypharmacy was found, all the data was collected and the prescription was analyzed for drug interaction and medication errors. The data obtained was pooled and analyzed.

In this technique, the inpatient case sheets and prescriptions will be screened for Analysis of prescriptions for different effects of polypharmacy on consistent schedule. All the prescribed medications alongside different prescriptions and important data will be noted in a modified information gathering structure to discover the polypharmacy and other. The examination patients will be pursued every day until their release. The Micromedex, Medscape, articles and relevant references books will be used as tools to review the collected data. The prescribed medication will be checked for their existence in the hospital and also the relevant dosing calculation and polypharmacy. Check for any error in prescription such as doses, frequency and route of administration and analysis of prescription for any polypharmacy etc.

All the outpatient's/inpatients prescriptions presented at outpatient pharmacy collected on daily basis and for polypharmacy, the prescriptions reviewed and it is noted in a predefined data collection form. The prescription components, drug utilization behavior and prescribing compliance to hospital formulary were noted and subjected for Analysis of prescriptions for various effects of polypharmacy.

Result and Discussion

During the study, a total number of 2000 prescriptions were assessed for polypharmacy in the out-patient pharmacy department of St. Philomena's Hospital. Among 2000 prescriptions received in outpatient pharmacy, 200 prescriptions were found to have polypharmacy. Out of 200 prescriptions101 (50.50%) were prescribed to female patients and 99 (49.50%) were prescribed to male patients. Majority of the prescriptions were prescribed to female patients.

Out of 200 prescriptions, 63(31.50%) patients belonged to the age group of 0-10 years followed by 34(17%) patients who belonged to age group of 31-40, 29(14.50%) patients belonged to the age group of 21-30 years. table 1

Table 1: Distribution of patients based on Age category

Age category	No of patients	Percentage (%)
Neonates & infants	52	26
Pediatrics	14	7
Adolescents	2	1
Adults	113	56.5
Geriatrics	19	9.5
Total	200	100

Out of 200 prescriptions, it was found that 134(67%) had 5 drugs followed by 42(21%) with 6 drugs, 15 (7.50%) with 7 drugs and 9(4.50%) with more than 7 drugs. Out of 200 patients, it was found that113 (56.50%) patients were adults followed by 52(26%) patients of neonates and infants, 19 (9.50%) patients were geriatrics, 14(7%) patients were pediatrics and 2(1%) patients were adolescents. Out of 113 (56.50%) prescriptions for adults, 78(69.02%) had 5 drugs, 21(18.58%) had 6 drugs,8(7.07%) had 7 drugs ,6(5.30%)had more than 7 drugs. Among 52(26%) prescriptions for neonates and infants, 40(76.92%) had 5 drugs, 9(17.30%) had 6 drugs, 3(5.76%) had 7 drugs. table 2

Table 2: Distribution of patients based on No of drugs &Age category

Age group	Prescription contains 5 drugs	Prescription contains 6 drugs	Prescription contains 7 drugs	Prescription more than 7	Total
Neonates &infants	40 -76.92%	9-17.3%	3-5.76%	0	52
Pediatrics	8-57.14%	6-42.85%	0	0	14
Adolescences	0	2-100%	0	0	2
Adults	78-69.02%	21-18.58%	8-7.07%	6-5.30%	113
Geriatrics	8-42.1%	4-21.05%	4-21.05%	3- 15.78%	19
Total	134	42	15	9	200

Among 19(9.50%) prescriptions for geriatrics, 8(42.10%)had 5 drugs ,4(21.05%)had 6 drugs,4(21.50%)had 7 drugs ,3(15.78%)had more than 7 drugs. Among 14(7%) prescriptions were for pediatrics, 8 (57.14%) had 5 drugs, 6(42.85%) with 6 drugs. 2(1%) prescriptions were for adolescence and both (100%) had 6 drugs.

In 200 prescriptions, a total number of 1174 drugs were prescribed. The common route of drug administration was found to be oral 923(78.62%) followed by injections 168(14.31%), inhalations 36(3.06%), topical 35(2.98%) and subcutaneous 12 (1.02%). Out of 1174 drugs that were prescribed, majority of drugs- 122 (61%) belonged to the class of Analgesics followed by Antibiotics-65 (32.50%) and Vitamins-55 (27.50%).

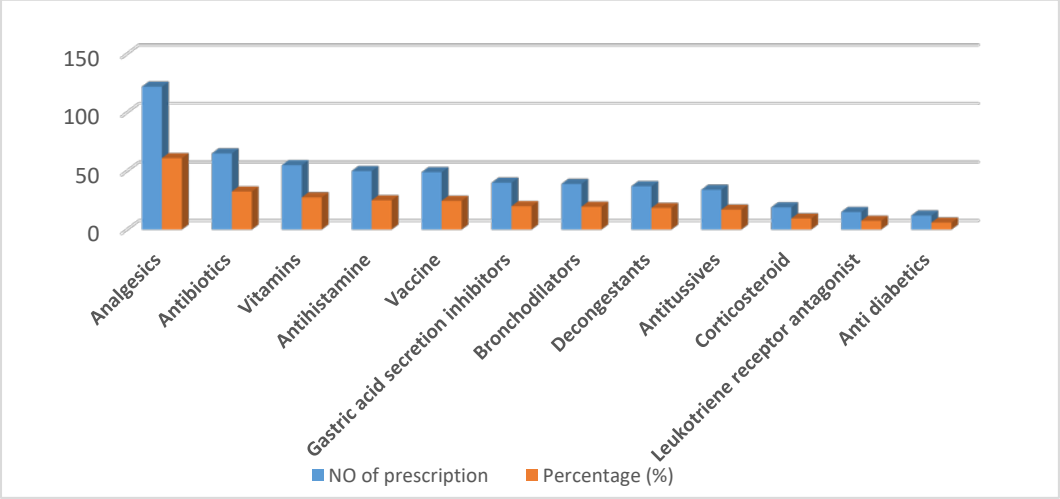

Figure 1**:** Most common therapeutic classes of drugs prescribed

Among the Analgesics class prescribed- 140(93.33%) were Non-opioid analgesic followed by- 10(6.66%) opioid analgesic. Among Antibiotic class prescribed- 59(58.41%) were Penicillin followed by Quinolones- 23(22.77%), Macrolides- 9 (8.91%), Cephalosporin- 8 (7.92%) and Tetracycline- 2(1.98%). Among Vitamins class prescribed- 44(52.38%) were Fat soluble vitamins followed by- 40(47.61%) Water soluble vitamins. Among Antihistamines prescribed- 55 (76.38%) were 2ndGeneration and followed by-17(23.61%) 1stGenerations. Among Vaccines class prescribed- 43(40.18%) were Live attenuated vaccine followed by- 35(32.71%) Toxoids and - 29(27.10%) Killed inactivated vaccine. fig 1

Among Gastric acid secretion inhibitors class prescribed- 34 (77.27%) were Proton pump inhibitors followed by- 10 (22.72%) H2antihistamines. Among Bronchodilators class prescribed- 30(50%) were Beta2 sympathomimetics followed by-26 (43.33%) Methylxanthine and - 4(6.66%) Anticholinergics. Among 200 prescriptions assessed a total number of 82 drug interactions were found in which major was- 43(52.43%) followed by moderate- 36(43.90%) and minor- 3(3.65%). Table 3

Table 3: Type of drug interactions in the prescription

Type of drug interaction	Frequency	Percentage (%)
Major	43	52.43
Moderate	36	43.9
Minor	3	3.65
Total	82	100

Among 82 drug interactions there were no interactions found in the prescription of neonates and infants, pediatrics, adolescence group but- 55(67.07%) drug interactions were found in adult followed by- 27(32.92%) in geriatrics. Among the drug interactions observed in adults group- 28(50.90%) was found to be major followed by- 25(45.45%) moderate and - 2(3.63%) minor. Among drug interactions observed in geriatrics group- 15(55.55%) was found to be major followed by- 11(40.74%) moderate and- 1(3.70%) minor. Among 43 major drug interactions- 32(37.20%) drug interactions were found in Anti-inflammatory class followed by- 11(12.79%) Antibiotic class, 11(12.79%) steroid class and 7(8.13%) Antidiabetic class. table 4

Table 4: Major drug interactions based on drugs class

Drugs class	Frequency	Percentage (%)
Anti-inflammatory	32	37.2
Antibiotic	11	12.79
Steroid	11	12.79
Anti-diabetic	7	8.13
Antidepressant	6	6.97
Antihypertensive	4	4.65
Diuretic	3	3.48
Dopamine receptor antagonist	2	2.32
Digoxin	2	2.32
Benzodiazepine	1	1.16
Vitamin	1	1.16
Selective serotonin norepinephrin inhibitor	1	1.16
Antitussive	1	1.16
xanthenes	1	1.16
Analgesic	1	1.16
Thyroid hormone	1	1.16
Immune suppressant	1	1.16
Total	86	100

Among- 32(37.20%) Anti-inflammatory class the majority of drug interactions were noticed with Diclofenac- 9 (28.12%) followed by Piroxicam- 6 (18.78%). Among- 11(12.79%) Antibiotic class the majority of drug interactions were noticed with Levofloxacin- 5(45.45%) followed by Metronidazole- 2 (18.18%). Among- 11(12.79%) Steroid class the majority of drug interactions were noticed with Dexamethasone- 5 (45.45%) followed by Betamethasone- 2 (18.18%). Among- 7(8.13%) Anti-diabetic class the majority of drug

interactions were noticed with Metformin- 2(28.57%) followed by Pioglitazone- 1(14.28%). Among 82 drug interactions- 43(52.43%) were major drug interactions, out of them- 33(79.74%) were pharmacokinetic type- 6(13.95%) was pharmacodynamic and- 4(9.30%) was unknown mechanism. table 5

Table 5: Major drug interactions based on Antibiotics, Steroid, Anti-diabetics

Drugs class	Frequency	Percentage (%)
Antibiotics		
Levofloxacin	5	45.45
Metronidazole	2	18.18
Amoxicillin	1	9.09
Doxycycline	1	9.09
Ciprofloxacin	1	9.09
Azithromycin	1	9.09
Steroid		
Dexamethasone	5	45.45
Betamethasone	2	18.18
Methylprednisolon	3	27.27
Deflazacort	1	9.09
Anti-diabetics		
Metformin	2	28.57
Piogliptazone	1	14.28
Glyburide	1	14.28
Glimepride	1	14.28
Insulin	1	14.28
Metformin+vidagliptin	1	14.28

Conclusion

During the study period of 06 months from 2015-2016, a total number of polypharmacy prescription obtained from the outpatient pharmacy of St.Philomena's Hospital were found to be 200. During the study period, a total of 2000 prescriptions were received at the outpatient pharmacy. Among which 200 prescriptions were found to have polypharmacy. Polypharmacy was observed in the hospital in 10% of the prescription. Most common drugs prescribed as polypharmacy was Analgesics, Antibiotics, Vitamins, Antihistamines and Vaccines.

Polypharmacy was observed in adult female patients more than male patients. Out of 200 prescriptions of polypharmacy drug interactions were found in -82 prescriptions. Among - 82 drug interactions were found in which major was- 43, moderate- 36 and minor- 3. Among - 82 drug interactions were found in which adults were -55 and geriatrics- 27. The mechanism of drug interaction was- 33 pharmacokinetic, 6 pharmacodynamic and- 4 unknown.

References

Moriarty F, Hardy C, Bennett K, Smith S, Fahey T. (2015). Trends and interaction of polypharmacy and potentially inappropriate prescribing in primary care over 15 years in Ireland: a repeated cross-sectional study. BMJ Open. 5(9): e008656.

Najjar, M. F., Aziz, N. A., Hassan, Y., Ghazali, R., AlRazzaq, H. A. A., & Ali, Z. (2010). Predictors of polypharmacy and adverse drug reactions among geriatric in patients at malaysian hospital. HealthMED, 4(2), 273-283.

Nobili, A., Licata, G., Salerno, F., Pasina, L., Tettamanti, M., Franchi, C., ... & Marcucci, M. (2011). Polypharmacy, length of hospital stay, and in-hospital mortality among elderly patients in internal medicine wards. The REPOSI study. European journal of clinical pharmacology, 67(5), 507-519.

Wilson, K. (2010). Polypharmacy: Making it all work.

Zarowitz, B. J., Stebelsky, L. A., Muma, B. K., Romain, T. M., & Peterson, E. L. (2005). Reduction of high‐risk polypharmacy drug combinations in patients in a managed care setting. Pharmacotherapy: The Journal of Human Pharmacology and Drug Therapy, 25(11), 1636-1645.