

Polypharmacy in Elderly Patients: A Research article in Teaching Hospital

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Abstract:

Objective: Polypharmacy refers to use of multiple medications by patient. The present study was undertaken to study prescribing pattern of various drugs in elderly patients.

Polypharmacy¹ implies to the prescription of too many medications for an individual patient with an associated higher risk of adverse drug reactions (ADRs) and drug interactions.

Materials and Methods: The study was conducted in Government Medical College and Hospital, Mahabubnagar from March, 2018 to April, 2018. A total of 100 case record of in patients > 65 years in medicine wards reviewed.

Results:

- ❖ 100 cases records were analyzed during the study period. Most of the patients were in the age group of 65-70 years.
- ❖ Maximum of these cases were from Hypertension and Diabetes. Anti Hypertensives are 32% followed by oral Anti Diabetic drugs (24%) and then Antimicrobial drugs (24%) Analgesics (20%), Antiepileptics (20%) and drugs used gastrointestinal system are (20%).
- ❖ Followed by insulin and analogues (15%) and drugs acting on respiratory system (18%).
- ❖ Polypharmacy was observed in (82.8%) 5-8 drugs were prescribed for most patients (42.6) followed by >8 drugs (40.2%).

Conclusion:

- This study has shown the patients of diseases in elderly patients.
- Prevalence of Polypharmacy is high in elderly patients.
- Many studies proved that due to inappropriate medication leads to adverse drug reactions, hospitalizations falls etc.
- To reduce Polypharmacy²⁰ elderly should aware the reveal the drugs already taken by them when they visit a physician. Elderly should be discourage to take unnecessary medicines.
- It is also necessary the need for creating more awareness among the general practitioners and clinicians on polypharmacy on elderly through continued medical education.

Keywords: Polypharmacy, geriatric syndromes, Prescribing drugs

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I. Introduction

Polypharmacy it can be explained as the

- ❖ Use of multiple medications² generally referred to five or more prescribed drugs per day and /or the administration of more medications³ than are clinically indicated, representing unnecessary/unwanted drug use.
- ❖ The elderly population is increasing worldwide. Advances in therapy has increased the life span with an increase in the number of patients above 60 Years of age. These patients suffer from multiple diseases like Diabetes mellitus, Hypertension, Arthritis, Cancer, Cardio Vascular diseases & Neurological problems warranting the use of more number of drugs compare to younger.

Inter individual differences in age related adults. Pharmacokinetic and Pharmacodynamic changes as well as co-morbid conditions have to be considered while prescribing medicines in elderly population. In old age there is reduced cardiac output and poor blood circulation causing delayed absorption, decreased metabolism and decreased renal function and increased body fat.

- As a result the drug remains in the body for long periods and gets accumulated in different organs of the body leading to increased risk of adverse drug reactions. According to World Health Organization, Polypharmacy refers to use of multiple medications by a patient. Incidence among elderly is reported to be 20% to 40%⁴

II. Objectives

- I) To study the risk factors for polypharmacy.
- II) To assess the causes for polypharmacy .
- III) To study the prescribing pattern of various drugs.
- IV) To find out measures to reduce and manage polypharmacy.

I) Risk factors for Polypharmacy:

- ❖ World Health Organization has evaluated that in every nine people there is one elderly people of age 60 year's or older⁵. This value is increased to one in five people by 2050 accounting for about half of the total growth of the world population.
- ❖ Elderly people are at a greater risk for adverse drug reactions because of the metabolic changes and reduced drug clearance associated with ageing. This risk factor is further more exacerbated by increasing the number of drugs used.
- ❖ Potential of drug – drug interactions⁶ is further increased by use of multiple drugs.
- ❖ Polypharmacy was found to be an independent risk factor for hip fractures.
- ❖ Polypharmacy may sometimes leads to “**Prescribing cascades**”⁷.

“**Prescribing cascades**” is said when signs and symptoms of an Adverse drug reaction is misinterpreted as a disease and a new treatment / drug therapy is further added to the earlier prescribed treatment to treat the condition. This inherits the potential to develop further more side effects and thus making a prescribing cascade.

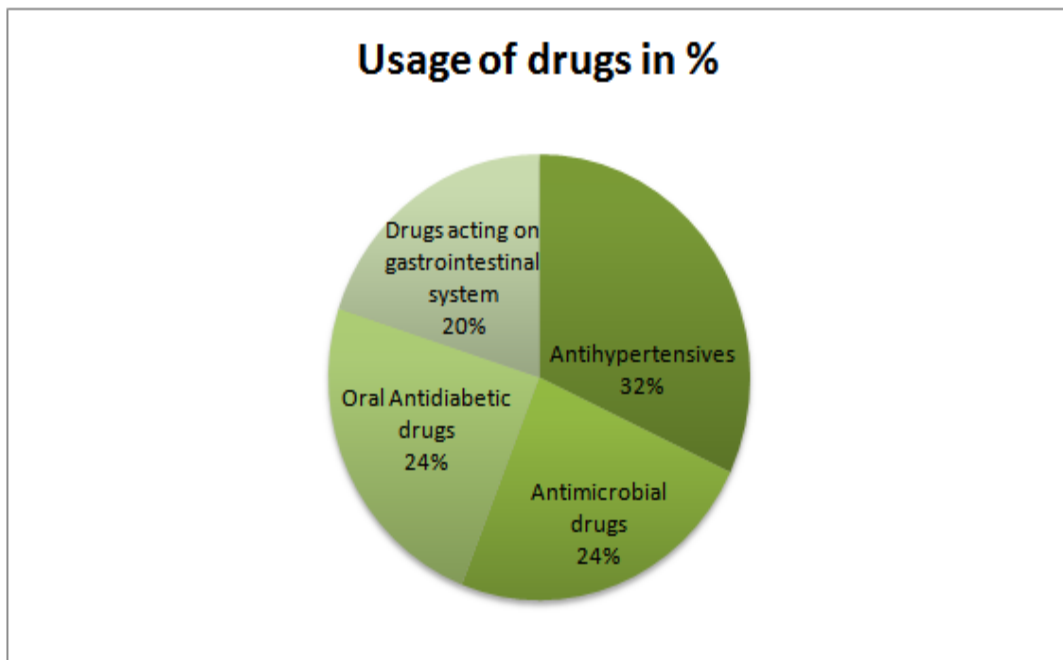
II) Causes of Polypharmacy:

- ❖ An aging population with comorbidities requiring several different medications and an increasing availability of newer medications⁸.
- ❖ Patients self medicating with over the counter medications and herbal preparations without a clear understanding of the adverse reactions and interactive effects
- ❖ A “**prescribing cascade**” which occurs when patients take a medication and exhibit side effects that are misinterpreted by the health care practitioner as a symptoms of a disease and requiring additional medication⁹.
- ❖ The patient sees several physicians and fills prescriptions at different pharmacies, but there is a failure to keep all parties informed about each other's actions.
- ❖ Ineffective communication and coordination between healthcare practitioners results in redundancy.

III) Category of Drugs Prescribed:

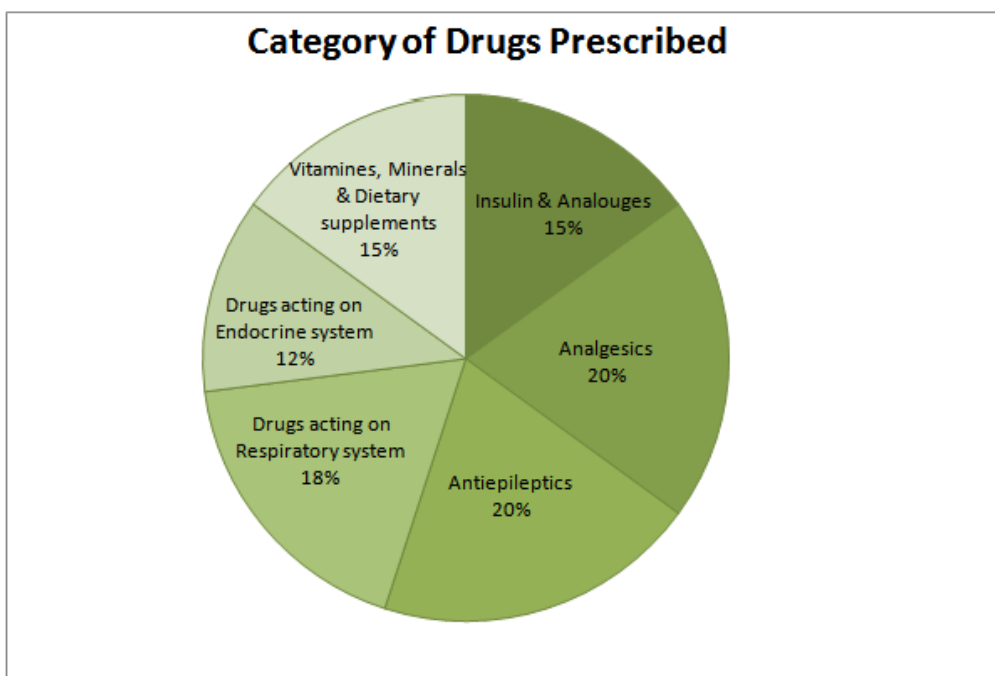
a) The most commonly prescribed drugs were

Category of Drugs	Usage of Drugs in %
1.Antihypertensives	32%
2.Antimicrobial drugs	24%
3.Oral Antidiabetic drugs	24%
4.Drugs acting on gastrointestinal system	20%



b) The less commonly prescribed drugs were

Category of Drugs	Usage of Drugs in %
1. Insulin & Analogues	15%
2. Antiepileptics	20%
3. Analgesics	20%
4. Drugs acting on Respiratory system	18%
5. Drugs acting on Endocrine system	12%
6. Vitamines, Minerals & Dietary supplements	15%



IV) Approaches to Reducing Polypharmacy:

- ❖ Maintain an accurate medication and medical history. Identify all medications including any over the counter therapies. Having a complete list of medications can deter a provider from adding on an additional therapy. Further knowledge of a specific medication being used may explain a patient specific symptom or complaint.
- For example, knowing a patient is on an opioid analgesic may explain why he or she has constipation. A complete history of patient’s medical condition is also important. Identifying the patient medical history allows the pharmacist to identify inappropriately prescribed medications. For instance metformin is not appropriate for patients endstage kidney disease.
- ❖ Link each prescribed medication to a disease state. Each medication should match a patient’s diagnosis. Any medication that doesnot match a diagnosis is potentially unnecessary and an attempt to discontinue the medication should be made.
- ❖ Identify medications that are treating side effects. The use of multiple medications leads to a higher risk of side effects¹⁰. When side effects occur, additional medications can be initiated to treat the side effects. A common example includes use of a laxative to treat the medications side effect of constipation.
- ❖ Evaluating a patients medications regimen and educating a patient upon discharge from a facility is likely to reduce duplicate therapy, Inappropriate prescribing and reduced unnecessary medication¹¹.
- ❖ Taking preventions during prescription. Use of appropriate medicines¹² for the patient and the potential for side effects must be considered. Any drug that is unnecessary inappropriate or has a high likelihood for causing side effects that would require additional therapy should be avoided.

Some examples of drug-disease interactions¹³

Disease	Drugs	Effect
Dementia	<ul style="list-style-type: none"> • Anticholinergics • Benzodiazepines • Antipsychotics (chronic and as-needed use) • H2-receptor antagonists 	<ul style="list-style-type: none"> • Adverse CNS effect • Antipsychotics are associated with greater risk of cerebrovascular accident and mortality in individuals with dementia.
Congestive heart failure	<ul style="list-style-type: none"> • NSAIDs and COX-2 inhibitors • Thiazolidinediones • Nondihydropyridine CCBs 	<ul style="list-style-type: none"> • Potential to promote fluid retention and exacerbate heart failure.
Urinary incontinence	<ul style="list-style-type: none"> • Estrogen (oral and transdermal) • Diuretics • Cholinesterase inhibitors 	<ul style="list-style-type: none"> • Aggravation of incontinence
Gastric or duodenal ulcers	<ul style="list-style-type: none"> • Aspirin (>325 mg/d) • NSAIDs 	<ul style="list-style-type: none"> • May exacerbate existing ulcers or cause new or additional ulcers.
BPH	<ul style="list-style-type: none"> • Anticholinergic drugs 	<ul style="list-style-type: none"> • May cause urinary infection

BPH, benign prostatic hyperplasia; CCBs, calcium channel blockers; CNS, central nervous system; COX, cyclooxygenase; NSAIDs, nonsteroidal anti-inflammatory drugs.

Geriatric syndromes associated with polypharmacy¹⁴

Geriatric syndromes	Specific drug classes—with selected examples
Urinary incontinence	Anticholinesterase inhibitors, antidepressants, antihistamines, antihypertensives (calcium channel blockers, diuretics, peripheral alpha-1 blockers), antipsychotics, opioids, sedative-hypnotics
Delirium and dementia	Anticholinergics • Antidepressants: Amitriptyline, doxepin, paroxetine • Antihistamines: Diphenhydramine, hydroxyzine • Antimuscarinics: Oxybutynin, tolterodine • Antipsychotics: Chlorpromazine, olanzapine • Antispasmodics: Atropine, dicyclomine, scopolamine • Skeletal muscle relaxants: Cyclobenzaprine Benzodiazepines Corticosteroids H2-receptor antagonists Sedative hypnotics
Falls	Anticonvulsants, antihypertensives, antipsychotics, benzodiazepines, non-benzodiazepine–benzodiazepine receptor agonists, opioids, SSRIs, TCAs

Weight loss	Dysphagia: Bisphosphonates, doxycycline, iron, potassium Affecting taste and smell: ACE inhibitors, allopurinol, antibiotics, anticholinergics, antihistamines, calcium channel blockers Reducing appetite: Antibiotics, anticonvulsants
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ACE, angiotensin-converting enzyme; H, histamine; SSRIs, selective serotonin reuptake inhibitors; TCAs, tricyclic antidepressants.

Tools to identify polypharmacy and assist with appropriate medication use

Tool	Description
STOPP/START criteria	A Screening Tool of Older People’s Prescriptions (STOPP) and Screening Tool to Alert to Right Treatment (START)
Beers criteria	An evidence-based list of potentially inappropriate medications that are best avoided, prescribed at reduced dosage or with caution, or carefully monitored in older adults and in those with certain diseases or syndromes
Medi-Cog	A 7-minute tool designed to assess cognitive literacy and pillbox skills in order to optimize medication safety. It is a combination of the Mini-Cog, a validated cognitive screen, and the Medication Transfer Screen (MTS), a pillbox skills test.
Good Palliative-Geriatric Practice Algorithm	Assists with drug discontinuation in the outpatient setting. Asks the prescriber to consider drug indication, dose, benefits, and potential adverse effects.
Deprescribing.org	4 evidence-based guidelines to support clinicians in safely reducing or stopping medication in 4 specific drug classes: proton pump inhibitors, benzodiazepine-receptor agonists, antipsychotics, and antihyperglycemics

Poly pharmacy brings with it increased risks for adverse drug events and reduced functional capacity. This 4-step plan will help in deprescription in older adults safely.

Deprescribing process is the Process of identifying and discontinuing medications that are unnecessary, ineffective, and/or inappropriate in order to reduce polypharmacy and improve health outcomes. Deprescribing is a collaborative process that involves weighing the benefits and harms of medications in the context of a patient’s care goals, current level of functioning, life expectancy, values and preferences. This article reviews polypharmacy and discusses safe and effective deprescribing strategies for older adults in the primary care setting.

Polypharmacy often occurs when an adverse drug effect is misinterpreted as a new medical problem, leading to the prescribing of more medication to treat the initial drug induced symptom.

Where to start: Which drugs to deprescribe

Deprescribing drugs	Examples
1. Drugs lack therapeutic efficacy.	<ul style="list-style-type: none"> • Antihypertensives that have not provided blood pressure control despite patient adherence • SSRIs started for mood changes without notable improvements • Docusate prescribed for constipation
2. Drugs potentially inappropriate.	<ul style="list-style-type: none"> • Drugs such as benzodiazepines, NSAIDs, anticholinergic drugs
3. Drugs lack a particular indication.	<ul style="list-style-type: none"> • A diuretic started for edema in a patient without congestive heart failure • A PPI prescribed as prophylaxis during a hospital stay that was continued on discharge
4. Drugs those take a long time to benefit patients.	<ul style="list-style-type: none"> • Statins do not produce benefit until about 2 years after initiation (in low-risk patients). • Aspirin as primary prophylaxis in a low-risk patient may not produce benefit for at least 5 years.
5. Drugs those are unlikely to provide additional benefit during a patient’s lifespan.	<ul style="list-style-type: none"> • A statin started for primary prophylaxis in a patient with life expectancy <5 years. • A bisphosphonate in a low-risk patient with life Expectancy <5 years.

Bid, twice daily; NSAIDs, nonsteroidal anti-inflammatory drugs; PPI, proton pump inhibitor; SSRI, selective serotonin reuptake inhibitor.

Deprescribing considerations by medication class

Drug class	Reason to consider deprescribing	Potential benefits of deprescribing	Recommendations
Antihypertensives	<ul style="list-style-type: none"> • Target blood pressures for adults >80 years are debated • Systolic BP <140 mm Hg may increase morbidity/mortality in patients >80 years • Diuretics are associated with Hypotension & incontinence 	<ul style="list-style-type: none"> • Lower mortality • Lower risk of cardiovascular events • Deprescribing diuretics is associated with a decrease in adverse drug effects 	<ul style="list-style-type: none"> • Reduce dose or number of antihypertensives for patients with BPs below their targets • Monitor closely and reinstate if needed
Statins	<ul style="list-style-type: none"> • Not well studied in patients >70 years (data from younger patients simply extrapolated) • Low total cholesterol associated with higher mortality in patients • High risk for myopathy and cognitive impairment 	<ul style="list-style-type: none"> • Improved quality of life in patients with limited life expectancy • Not associated with increased risk of cardiovascular events, mortality, etc. • Likely to provide benefit for 5+ years after cessation 	<ul style="list-style-type: none"> • Consider stopping statin drugs in patients who: <ul style="list-style-type: none"> - are >80 years - have been on the medication for >5 years (for primary prophylaxis) - may have a life expectancy <5 years - are experiencing significant myopathy
Antipsychotics	<ul style="list-style-type: none"> • Started for patients with dementia, despite lack of evidence to support their use • Can cause cardiovascular, and cognitive adverse effects, including stroke and death 	<ul style="list-style-type: none"> • Improved cognition • Improved verbal fluency • Low-risk for withdrawal 	<ul style="list-style-type: none"> • Taper slowly over 3-6 months in patients with dementia • Monitor for return of neuropsychiatric symptoms • Attempt behavioral interventions if symptoms return • Reinitiate if needed
NSAIDs/aspirin (>325 mg/d)/COX-2 inhibitors	<ul style="list-style-type: none"> • Can create or exacerbate multiple conditions including CKD and CHF • Exacerbate existing ulcers or cause new/additional ulcers 	<ul style="list-style-type: none"> • Decreased risk for fluid retention in patients with heart failure • Decreased BP • Decreased risk of acute Kidney injury/progression of CKD 	<ul style="list-style-type: none"> • Switch from NSAID to acetaminophen • Consider steroid joint injection if medication is taken for osteoarthritis • Monitor pain symptoms

BP, blood pressure; CHF, congestive heart failure; CKD, chronic kidney disease; COX, cyclooxygenase; NSAIDs, nonsteroidal anti-inflammatory drugs.

III. Discussion

- ❖ The use of multiple medications often termed polypharmacy is recognized as a potentially serious problem in the management of elderly patients.
- ❖ Polypharmacy is increasing because of not only co-morbid conditions but also due to increased awareness about drugs, literate elders or care takers and pressure on the physicians to prescribe a drug for each symptom.
- ❖ Polypharmacy associated with increased medical expenditure a retrospective cohort study was conducted. In this study increased risk of outpatient visits, and hospitalization leading to 30% increase in medical costs¹⁵.
- ❖ Another¹⁶ study was conducted by bangeois and shawson mc, valec. In this study due to inappropriate medication there is increased risk of adverse drug reactions taking 5 or more medications.
- ❖ Due to inappropriate medications unplanned hospitalization was almost four times more in elderly taking more than 5 medications¹⁷.
- ❖ Meta analysis of E. gaugler¹⁸ study shows that functional and cognitive impairment in elderly are need of hospital admissions.

IV. Results

- ❖ 100 cases records were analyzed during the study period. Most of the patients were in the age group of 65-70 years.
- ❖ Maximum of these cases were from Hypertension and Diabetes. Anti Hypertensives are 32% followed by oral Anti Diabetic drugs (24%) and then Antimicrobial drugs (24%) Analgesics (20%), Antiepileptics (20%) and drugs used gastrointestinal system are (20%).
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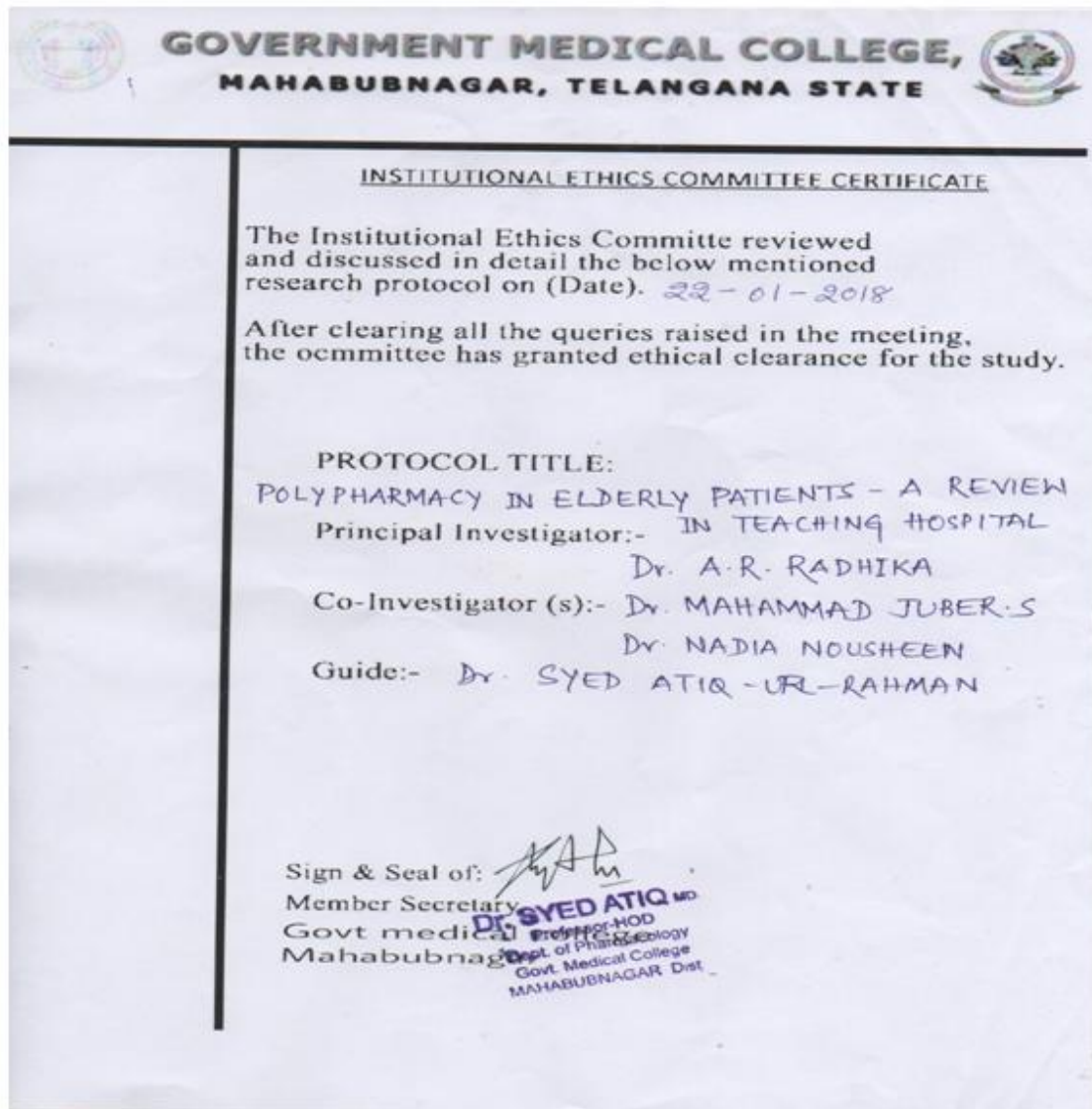
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