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Drug monitoring in hypertensive and diabetic patients in tertiary care hospital

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Abstract
The attempt of present course work was to study the drug monitoring in hypertensive and diabetic patients, prescribing pattern, drug interaction and adverse drug reactions and there should be close observation for the patients receiving these medicines. They are considered as co morbidities because they occur together and share the same physiology and risk factors. Hence the early and correct diagnosis and treatment is needed. The most of the anti hypertensive and antidiabetics drugs have many drawbacks on many systems if they used for long time and these medicines have to be taken for long period only.

Keywords: Drugs, Diabetes mellitus, Hypertension, Diabetes patients.

1. Introduction
The most of the anti hypertensive and antidiabetics drugs have many drawbacks on many systems if they used for long time and these medicines have to be taken for long period only. More ever they exist the direct or indirect effect on renal system and endocrine etc, hence these patients must be closely monitored during the therapy (TDM), otherwise it may induces many disorders predominantly diabetes or hypertension.

Hypertension [1]
Hypertension (HTN) or high blood pressure, sometimes called arterial hypertension, is a chronic medical condition in which the blood pressure in the arteries is elevated. This requires the heart to work harder than normal to circulate blood through the blood vessels. Blood pressure is summarized by two measurements, systolic and diastolic, which depend on whether the heart muscle is contracting (systole) or relaxed between beats (diastole). Normal blood pressure at rest is within the range of 100-140mmHg systolic (top reading) and 60-90mmHg diastolic (bottom reading). High blood pressure is said to be present if it is persistently at or above 140/90 mmHg.

Classification of Hypertension (ASH):
American Society of Hypertension (ASH): This society says that Normal blood pressure is that where the individual with optimal level of BP and there is no idendifiable early signs of cardiovascular disease. According ASH average BP levels are usually<120/80 mmHg, but occasionally elevated BPs even to the level of <140/90 mmHg is also considered as normal range only**.**
Stage 1 -Hypertension
Stage 2- Hypertension
Stage 3-Hypertension

Epidimalogy [2]
As of 2000, nearly one billion people or ~26% of the adult population of the world had hypertension. It was common in both developed (333 million) and undeveloped (639 million) countries. However rates vary markedly in different regions with rates as low as 3.4% (men) and 6.8% (women) in rural India and as high as 68.9% (men) and 72.5% (women) in Poland.

Diabetes Mellitus
Definition [3]
Diabetes mellitus describes a metabolic disorder of multiple aetiology characterized by chronic hyperglycaemia with disturbances of carbohydrate, fat and protein metabolism resulting from defects in insulin secretion, insulin action, or both. Diabetes is a type of disease in which the body fails to regulate the amount of glucose necessary for the body. Even more concerning is the fact that a wide number of people affected by the disease remain unidentified orare unaware that they have it.

Classification
The two main types of diabetes are called type 1 and type 2. A third form of diabetes is called gestational diabetes.

Diabetes and Hypertension [4]
It is common metabolic path way, they occur frequently together, the causes and mechanism of disease is closely overlapped to each other. Over weight, inflammation, oxidative stress, and insulin resistance are consider as common path way. For the effective treatment and prevention the cause and mechanism of disease should be known.

Literature Review
1. Viswanathan Mohan *et al.* (2013) [5], reviewed the DM and HTN are prone to induce the many disorders in patients, there is a strong correlation between changing lifestyle factors and increase in both DM and HTN. Challenges in managing both DM and HTN more to patient and doctors. As primary health care is the first level of contact of the individuals, the family, and the community with the national health system, there is an urgent need for an integrated approach at primary health care (PHC) level for addressing the burden of HTN and DM. The aim of this paper is to review the available literature on the burden of DM and HTN in the SEA and AFR regions and to suggest

strategies to improve DM and HTN prevention and control in primary care in the two regions.

2. Ala 'a Alkerwi, *et al.* (2013) [6], conducted a study on status of unawareness of diabetes and hypertension in adult, because it may effect on CNS and CVS hence it is important to prevent the coronary and cerebrovascular diseases and for the improvement of health in adult. The considerable lack of awareness and insufficient management required a urgent need for intensive efforts to reduce the gap in preventing policies, and to control the cases according to standard clinical guidelines.
3. Nirrvan Patell *et al.*, (2009) [7], Hypoglycemia Associated with the Use of Levofloxacin, Seth M. Garber, Melanie W. Pound, Susan M. Miller was conducted a study on drug–drug interaction and case series involving fluoroquinolones and antihyperglycemic medications. The fluoroquinolones involved in these reports were gatifloxacin (seven cases), ciprofloxacin (two cases) and levofloxacin (three cases). Glyburide was the most often implicated anti hyperglycemic drug, accounting for five of the cases. The remaining interactions involved glimepiride, pioglitazone (with glyburide), and repaglinide.
4. Wayne Putnam MD, *et al.* (2009) [8], reviewed, HTN is commonly seen in patients with NIDDM, and it is still not well controlled, after the use of more than two antihypertensive drugs, the close observation says that at maximum dosing, 66% of patients did not achieve target BP values. Practice based policies to increase dosing and numbers of drugs prescribed might be required.
5. Walterr Zidek *et al.*, (2008) [9], assessed the use of core anti hypertensive drugs for the treatment of pre diabetes is need a precaution, the patients on antihypertensive therapy are more risk of developing the diabetes for which exact guideline for the use antihypertensive are still missing. The predictable mechanism for the induction of diabetes from antihypertensive drug is destruction of islet cell which impaired the pancreatic functions followed by peripheral insulin resistance and glucose impaired tolerance. The RAS itself plays important role in the development of DM. Over dose of RAS is reduced the insulin and glucose delivery to the peripheral skeletal.
6. Janet A. Rowan, M.B, Ch, B, *et al.* (2008) [10], reviewed the study of using the metformin as anti-diabetic in gestational diabetic women's, as metformin is used commonly in this condition, where as its efficacy and safety for this conditions are lacking. In women with gestational diabetes mellitus, metformin alone or with supplemental insulin is not associated with increased perinatal complications as compared with insulin. Hence the women preferred metformin to insulin treatment

Materials

This is the quantitative study with descriptive quantitative phase; data were collected from medical record of 800 to 1000 patients of different families, in cardiology and general medicines department in Princess Asra Hospital a super specialty hospital Shah Ali Banda, Charminar, and Hyderabad.
The qualitative phase was individually interviewed and is conducted with 5 physicians and 25 patients every week.

Study Design

1. Single center means OPD,
2. Observational pts / IPD or ICU.
3. Non-interventional study.
4. Random patients
5. Prospective observational study to design the prescribing pattern of anti Hypertensive drugs.
6. Patient selection was random
7. Total 800 to 1000 patient samples from OPD and IPD were included.

Study Criteria

1) Inclusion Criteria

Patients in Princess Asra Hospital, Shah Ali Banda, Charminar, Hyderabad, Andhra Pradesh.

1. under the guidance General physician and associates.
2. Patients (in and out-patients) of both genders with all age.
3. 3. Patients who are willing to give verbal and authentic information and are consent for the study and willing to participate.

2) Exclusion Criteria

1. Patients in I.C.U, and other non-selected departments.
2. Patients with previous history of any disorder or toxicity taking any other drug besides anti-diabetic anti-hypertensive drugs.
3. Pregnant and lactating mothers.

The patients taking other than cardiology and general medicine

Source of Data

Patient data relevant to the study was obtained from the following sources

1. Treatment chart or case sheet of patient
2. Patient data collection form
3. Medication or prescription
4. Patients counseling.

Drug Interactions

A drug interaction is a situation in which a substance (usually another drug) affects the activity of a drug when both are administered together. This action can be synergistic (when the drug's effect is increased) or antagonistic (when the drug's effect is decreased) or a new effect can be produced that neither produces on its own). However, interactions may also exist between drugs and foods (drug-food interactions), as well as drugs and medicinal plants or herbs (drug-plant interactions). These interactions may occur out of accidental misuse or due to the lack of knowledge about the active ingredients involved in the relevant substances.
The interaction of the two drugs may also increase the risk that side effects will occur.

Methods

A prospective observational study was conducted in both inpatient and outpatients of cardiology and general medicine department at Princess Asra Hospital, who have been diagnosed with either hypertension, Diabetes or both, Demographic details (name, age, education, occupation, income of the patient was collected. Admission, diagnosis and condition of the patient were recorded. Drug data of all the antihypertensive drugs prescribed, dose frequency, route of administration and dose were recorded. The results were expressed.

Determination of Prescribing Patterns

Collection of Data

A suitable data collection form was designed and used. Data was collected with respect to

- Demographic details- Name, age, education, occupation, income of patient collected.
- Admission and discharge- diagnosis and the condition of patients on admission and discharge were recorded.
- Drug data- Brand and generic name of all antihypertensive drugs prescribed, dose frequency, route of administration and dose of drugs.

Assessmeny

The prescription order of hospitalized as well as out patients were evaluated. The design is a prospective and observational type of study. The drug was assessed according to history, physical examination. For each patient receiving antihypertensive treatment, demographic data, diagnosis, details of drug administration, indication for treatment, dosage, dose frequency, route of administration and their appropriateness were recorded on individual forms. And statistic method.

Results

Casesheet No.	Drug Regimen	Drug Interactions	Possible Effects Of Drug Interaction	Detected Adverse Effects
1	Glimepiride Voglibose Clopidogrel Losartan Metoprolol	Glimepirid↔metoprolol	Hypoglycemia (symptoms of low blood sugar) include headache, dizziness, drowsiness, nervousness, confusion, tremor, hunger, weakness, perspiration, and palpitations.	–
2.	Aceclo, Cholecalciferol, Vit-D3, Amitryptiline	–	–	Vomiting, morning sickness, cardiac ailment, numbness
3.	Clopid, Telma, Pan, Diclofenac Paracetamol	Clopidogre↔pantoprazole	Risk of reinfarction, heart attack, stroke, unstable angina, revascularization	Indigestion, Anorexia, constipation, frequent urination, body pain
4.	Metformin, Insulin iso, Pregabalin Azithro, Dextromethorphan, Aspirn	Metformin↔insulinisophane	hypoglycemia	Itching
5.	Cipro, Ranitidine, Ondan, Paracetamol, Tramadol, Telmisartan CPM, Codeine-Po4	Ciprofloxacin↔ondansetron Ciprofloxacin↔tramodol. Hydrocodone↔telmisartan	Arrhythmias, dizziness, lightheadedness, fainting, shortness of breath. Seizures HTN, orthostasis	–

Conclusion

The conclusion of the present study that there is need or scope for improving the prescribing habits of clinicians, in the present study the education intervention is needed. Rational prescribing system of drugs should be made a part of medical education at the undergraduate and post graduate levels with emphasis on integrated problems based on pharmacotherapeutic in teaching and practice. Many new potent, effective and expensive drugs have been introduced in recent decade which has led to a steady increase and often misuse of drugs. Other important reasons are

(a) Patient of antihypertensive should leave the fear; the clinician has to do a possible action which could satisfy the patient.
(b) The patient expects medicines when they are ill and have come to regard receiving them as a kind of social right.
(c) Finally it is the professional responsibility of doctor to do needfulness of patient.

Significant drug interactions

Like clopidogrel↔pantoprazole, ciprofloxacin↔ ondansetron, atorvastatin↔clopidogrel, atorvastatin↔pantoprazole, ceftriaxone↔furosemide etc.

ADR were assessed based on the drug interactions and also by patient counseling

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