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Diploma in Pharmacy 2nd Year
Community Pharmacy & Management
Experiment

Identification of drug-drug interactions in the prescription and follow-up actions.

Aim:

Identification of drug-drug interactions in the prescription and follow-up actions.

Reference :

‘ Dr. Gupta G.D. , Dr. Sharma Shailesh, Dr. Gupta Richa, “Practical Manual of Community Pharmacy and Management” Published by Nirali Prakashan, Page no 4 - 8

Theory :

A situation in which a substance affects the drug activity (ie, either increases or decreases the effects) or produce a new effect that does not produces on its own is termed as drug interaction.

Interaction between drugs (ie, drug-drug interaction) occurs most commonly However, interactions also occur between drugs and foods fie, drug food interactions), and drugs and herbs (ie, drug-herb interactions).

Drug-drug interactions between the following classes of drugs have been discussed below:

Table 1: Analgesics

Analgesics	Interacting Drugs	Possible Effects
1) Opioids	Phenoxybenzamine	The depressor effect of opioids is exaggerated.
2) Salicylates	Alkalinisers and antacids	The serum levels of salicylate decreases as the renal reabsorption of salicylate from alkaline urine reduces.
3) Salicylates	Indomethacin	The serum level of indomethacin decreases due to inhibition of gastrointestinal absorption.
4) Salicylates	Acidifiers, ascorbic acid, and ammonium chloride	The serum levels of salicylate increases due to enhancement in the renal absorption of salicylate from acidic urine.
5) Salicylates	Heparin and warfarin	Aspirin inhibits platelet aggregation, thus giving rise to additive effect which causes bleeding.
6) Salicylates	Probenecid	The uricosuric activity of probenecid decreases as both compete for the same binding site (albumin molecule) on plasma.
7) Phenylbutazone	Tolbutamide	The hypoglycaemic response increases as tolbutamide metabolism is inhibited.

Table 2: Diuretics

Diuretics	Interacting Drugs	Possible Effects
1) Furosemide, thiazides, and ethacrynic acid	Sulfonylureas	The effect of sulfonylureas antagonises due to depression of islets of Langerhans.
2) Thiazides	Methyldopa, guanethidine, and reserpine	The antihypertensive effects are increased by thiazides and this may cause hypotension.
3) Furosemide, thiazides, and ethacrynic acid	Digoxin	The cardiac effect and toxicity due to potassium depletion enhances.
4) Furosemide	Phenytoin	Response of furosemide decreases due to increase in sodium absorption.
5) Acetazolamide	Quinidine	The serum level of quinidine increases.
6) Spironolactone	Potassium chloride	Hyperkalaemia occurs as spironolactone is a potassium sparing diuretic.

Table 3: Cardiovascular Drugs		
Cardiovascular Drugs	**Interacting Drugs**	**Possible Effects**
1) Digitalis glycosides	Magnesium, calcium, and aluminium salts containing antacid	Absorption of cardiac glycosides decreases in GIT.
2) Digitoxin	Barbiturates	Digitoxin effect decreases due to induction of hepatic microsomal enzymes (responsible for digitoxin metabolism).
3) Quinidine	Digitalis glycoside	The clearance of digitalis glycosides is decreased and also displaced from the binding site by quinidine, thus the cardiac effect and toxicity of cardiac glycoside increases.
4) β-blockers (propranolol and atenolol)	Anti-diabetic agents	The release of glucose from the liver glycogen is inhibited by β-blockers and this causes hypoglycaemia.
5) Guanethidine	Tricyclic antidepressant	The antihypertensive effect antagonises as guanethidine uptake is inhibited.

Table 4: Gastrointestinal Drugs		
Gastrointestinal Drugs	**Interacting Drugs**	**Possible Effects**
1) Antacids	Aspirin	The absorption of aspirin decreases.
2) Magnesium carbonate and magnesium trisilicate	Digitalis glycoside	The absorption of cardiac glycosides decreases.
3) Aluminium hydroxide gel	Isoniazid	The absorption of isoniazid decreases.
4) Metoclopramide (antiemetic)	Levodopa	The absorption rate of levodopa decreases due to decrease in GIT motility.
5) Kaolin-pectin mixture	Digoxin	The absorption of digoxin decreases.

Table 5: Vitamin-Drug Interactions		
Vitamins	**Interacting Drugs**	**Possible Effects**
1) Vitamin B_{12}	Chloramphenicol	Vitamin B_{12} effect decreases due to interference in erythrocyte maturation.
2) Vitamin A	Mineral oil	Mineral oil impairs Vitamin A absorption.
3) Pyridoxine (Vitamin B_6)	Levodopa	Pyridoxine increases levodopa metabolism, thus decreases its effectiveness.
4) Vitamin D	Phenytoin and phenobarbital	Vitamin D metabolism is stimulated which reduces calcium serum level.
5) Vitamins	Oral contraceptives	Oral contraceptives cause deficiency of Vitamin B_{12}, Vitamin C, Vitamin B_6, and folic acid by inhibiting enzyme required for their absorption.

Follow-up Actions

1. Pharmacists should be familiar with all of their patients' current medications, including OTC medications, herbal remedies, and dietary supplements as well as medications prescribed by other physicians
2. He/she should ask relevant questions about diet and alcohol consumption to the patient
3. He/she should prescribe a few drugs in the low doses for short period of time.
4. He/she should determine the desired and undesired effects because they frequently result in a range of drug interactions.
5. He/she should facilitate drugs with a wide safety margin to prevent any unanticipated interactions from causing toxicity.
6. He/she should observe and monitor the patient for adverse effect especially after a therapy change because some interactions (such as those influenced by enzyme induction) may take 1 week to manifest.
7. He/she should consider drug interaction as a possible cause of any unexpected problems.
8. He/she should determine serum concentrations of specific medications being taken when unexpected clinical responses arise and consult

relevant literature or expert in drug interactions, and adjust the dosage until the intended effect is achieved.

9. He/she should replace the drug that does not interact with any others if adjusting the doses does not work.

Result :

Identification of drug-drug interactions was done in the prescription and follow-up actions were taken.

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