Food And Medication Interaction: Clinical Ramification

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Abstract- **While a drug interacts with other prescriptions the patient is taking, food, beverages, dietary supplements, or other pharmaceuticals the patient is ingesting, the effects of the drug may not be what was expected. These interactions can also happen while a patient is ill. A drug interaction occurs when a substance alters the activity of a drug, meaning that the drug's effects are either increased or decreased, or they produce a new effect that neither of the medications would have on their own. These interactions may arise from misuse or a lack of knowledge about the active ingredients in the relevant substances. Doctors and pharmacists know that when taken together, some foods and medications might alter how well the body uses a particular food. medication interactions frequently lead to unfavorable medication effects, however some may be exploited for the benefit of patients. Consequently, it is advised that patients adhere to their doctor's instructions in order to maximize benefits and minimize food-drug interactions. Data on general or particular drug interactions with food were extracted from several reviews and original papers in order to conduct the literature survey. This study will assist doctors and pharmacists in carefully prescribing medications with the only appropriate dietary supplement to provide the greatest possible benefit for the patient. It provides information about the numerous interactions between various foods and pharmaceuticals.**

Keywords: **Food – Drug Interaction, Anti- Diabetic, prescription.**

Introduction

When food is consumed at the same time as oral medication, it has the potential to affect the rate or amount of medication absorption, which can affect the maximum serum concentration and/or the time it takes to reach the maximum concentration. The goal of the research was to comprehend the intervening processes and the clinical symptoms resulting from food-drug interactions, as well as the significance of taking these interactions into account in the dietary and pharmaceutical approach[1]. The majority of the time, purposeful interactions between drugs and meals and plants can have major negative effects. Experts advise that something being "natural" does not always imply that it is 100% "safe''. Medication passes through the digestive system in the same manner as oral foods and herbs do. Consequently, there is an interaction that occurs when medications and specific meals are eaten together. This interaction reduces the effectiveness of the medication taken or the amount of nutrients absorbed from the food[2].Additionally, taking vitamin and herbal supplements along with prescription medication might produce an antagonist's reaction, which modifies the effectiveness of the medicine being taken by affecting the food-drug interaction caused by the chemicals in the medication. Medication is used to treat and cure a wide range of health issues. However, in order to guarantee their safety and efficacy, they must be taken as directed[3]

Additionally, some foods may have an impact on the cytochrome P450 hepatic metabolism of pharmaceuticals. The overall effects of this can range from overt toxicity to decreased clinical efficacy of medication therapy. On the other hand, sometimes taking medication with food helps lessen unpleasant side effects like nausea, diarrhea, and/or dyspepsia. Additionally, there may be interactions between enteral nutrition (EN) and medicine administration. Concurrent oral or feeding tube medicine treatment with EN may result in increased side effects, blocked tubes, and decreased efficacy.Food and medication interactions may unintentionally boost or decrease the effects of the drug[4]. Certain frequently used fruits, herbs, and alcohol can make therapy fail to the point where the patient's health seriously deteriorates. The bulk of clinically significant drug-food interactions result from modifications in the drug's bioavailability brought on by food. The interactions that are linked to a high risk of treatment failure due to a markedly decreased bioavailability in the fed state are the most significant. Chelation with food ingredients often results in such interactions. Moreover, some medications' bioavailability may be altered by the body's reaction to food, specifically the secretion of gastric acid[5].

Pharmacokinetic (PK), pharmacodynamic (PD), and pharmaceutical interactions can all be affected by drug interactions. Pharmaceutical interactions can take place in the gastrointestinal lumen or within delivery devices like enteral feeding tubes (phenytoin binding to enteral feeding product protein components, for example). Foods can

change how medications are absorbed, distributed, metabolized, and excreted, which can lead to PK interactions[6]. PK interactions include, for example, the chelation of ciprofloxacin in the presence of divalent cations present in dairy products (which alters absorption), the inhibition of simvastatin's CYP3A4 metabolism by grapefruit juice (which alters metabolism), and the competition between lithium and sodium for renal tubular reabsorption (which alters excretion). Foods can change a drug's clinical effect on the body, resulting in PD interactions[7].

One instance of a PD interaction is when a diet high in vitamin K counteracts the benefits of warfarin therapy. Typically, a straightforward single-dose pharmacokinetic (PK) study is used to examine the impact of food. Measuring the rate and extent to which a drug is absorbed into systemic circulation allows one to quantify the presence of the food effect, which is typically reflected in changes in drugabsorption rate and extent [8]. Area under the concentration–time curve (AUC), which includes the AUC up to the most recent concentration measured at time t (AUC0-t) and the AUC extrapolated to infinity (AUC?), as well as oral bioavailability (F), are frequently used metrics for absorption extent. When there is PK information available for the intravenous dosage, the latter is feasibl. .. AUC? is favored in single-dose designs since it forecasts steady-state exposure. When extrapolation is not possible, AUC0-t is utilized instead, as is the case with extended-release formulations, endogenous substances, poorly absorbed medications, medications with a lengthy elimination half-life, and low assay sensitivity[9].The maximum concentration of plasma or serum (Cmax) and the time taken to reach Cmax (Tmax) are the indicators for absorption rate . Furthermore, the scope of our review is restricted to the food effect of drugs taken orally that are anticipated to show systemic exposure and systemic effect[10].

Food effect is the consequence of interactions between food and drugs under certain physiological conditions. Food may directly react with drugs or indirectly affect oral drug absorption by changing the postprandial gastrointestinal (GI) tract environment. Moreover, these interactions further depend on factors that are related to food categories, drug properties, and dosage regimens[11].

It is anticipated that research on genetic variables influencing pharmacokinetics and pharmacodynamics as well as drug-drug, food-drug, and herb-drug interactions will enhance drug safety and allow for customized drug therapy.Drugs can show their efficacy only if administered in appropriate quantity with appropriate combination of drugs and foods and at appropriate time Information regarding food-drug interactions is not always easily accessible, in contrast to information about drug-drug interactions[12]. Accurately determining the effects of food and nutrients on a specific drug is a challenging and complex problem. The purpose of this article is to increase the knowledge of patients and healthcare professionals, particularly doctors, pharmacists, and other medical professionals, regarding drug and food interactions[13]. All original research and review articles were included in this study after a two-month electronic search of the literature. No literature was older than 20 years. The medications were chosen and examined based on their overall usage pattern. It was also recognized that in order to improve the therapeutic use of these medications within the advised dosage range, it was necessary to report any interactions with various dietary supplements.[14]

The side effects of medication should be very specific, exhibiting linear potency, never being affected by concurrent food or other medications, having the same expected effect on all patients, being completely nontoxic at all dosages, and occasionally only needing one dose to effect a permanent cure. However, this ideal drug is still to be discovered[15]. A drug food interaction is a situation in which a substance affects the activity of a drug, i.e The effects are either amplified, attenuated, or generate a new effect that neither generates by itself. Drug-drug interactions are typically the first thing that come to mind. But there might also be interactions between medications and foods (drug-food interactions) or between medications and herbs (drug-herb interactions). There are thousands of pharmaceuticals on the market, and the majority of people probably take at least one pharmacological active ingredient on a regular basis[16]. There is a significant chance of drug-nutrient interactions given the volume of use and variations in dietary practices, food composition, and nutritional status among individuals. On the other hand, there is a long clinical examination and a comparatively modest list of recorded drug-food interactions. Health-care providers, such as physicians, pharmacists, nurses, and dietitian, have to be aware of important drug food interactions in order to optimize the therapeutic efficacy of prescribed and over-the-counter drugs. Here, we examine some of the most popular fruits and vegetables in order to educate medical professionals about potential nutrient-drug interactions and their prospective clinical implications.[17]

Fruits With Potential for Drug Interactions

Food-drug interactions have been identified with many fruits including grapefruit, sevilla oranges, tangerines, grapes, mangos, apples, and papaya. A summary of fruit interactions with medications is found in Table 1. Grapefruit juice produces the most well-studied and clinically significant food-drug interaction: more than 85 interactions between drugs and grapefruit juice have been identified[18]. The ingestion of as little as one grapefruit, or one cup of grapefruit juice, can result in a clinically significant and permanent inactivation of CYP3A4 enzymes within the gut. It takes an average of 48 to 72 hours for the body to replace the inactivated enzymes, Consequently, separating the ingestion of grapefruit from the dosing of daily medications does not prevent this food-drug interaction[19]. As a

result of this inhibition of CYP3A4 within the gut, the concomitant use of simvastatin and lovastatin in this setting may lead to increased exposure to these statins and resultant muscle toxicity up to and including rhabdomyolysis. Rosuvastatin, pravastatin, and fluvastatin are therapeutic amounts of grapefruit[20].
While food-drug interactions can occur with other fruits, most patients will not consume enough of these to produce an interaction. Sevilla oranges inhibit CYP3A4 and P-glycoprotein (P-gp) and can interact with atenolol, ciprofloxacin, cyclosporine, levofloxacin, and pravastatin. Grapes inhibit CYP3A4 and interact with cyclosporine. Through stimulation of CYP3A4 and inhibition of P-gp, ion tangerines interact with nifedipine and digoxin[21].

Vegetables With Potential for Drug Interactions

A number of vegetables, including broccoli, spinach, tomatoes, carrots, and red peppers, have been linked to food-drug interactions. Broccoli, brussels sprouts, kale, and spinach are high in vitamin K, eating large quantities or making sudden changes in the amount of the vegetable ingested can interfere with the effectiveness and safety of warfarin. Accordingly, patients should be advised to maintain a consistent diet of vitamin K-containing vegetables with concurrent warfarin therapy[21].

Some singnificant food drug interaction:

Antihypertensive Drug:

Concomitant moderate sodium restriction diets will be beneficial for patients on antihypertensive medications. If propranolol is taken with high-protein foods, its serum levels may rise. Oral clearance may increase with a diet shift from high protein/low carbohydrate to low protein/high carbohydrate. Smoking may decrease its plasma levels of by increasing its metabolism." The intestinal absception of celipralel (beta-blocker) is inhibited. when it is taken with orange juice[22].Orange juice's hesperidin is what causes celiprolol to be absorbed less readily The absorption of ACEs inhibitors is increased when taken. an empty stomach." While GFJ increases the bioavailability of felodipine (Ca2 channel blocker).
The common constituent in dietary supplements, icorice extract, contains both glycyrrhizin and glycyrrhetinic acid. It isa potent inhibitor of 11- ber- hydroxyl steroid dehydrogenase, it increases excess of cortisol to mineralocorticoid receptors causing sodium retention and potassium depletion, so it may interfere with various medicines including antihypertensive and antiarrhythmic agents[23].A high intake of liquorice can cause hypermineralocorticoidism with sodium retention and potassium loss, oedema, increased blood. pressure and depression of the renin-angiotensin-aldosterone system.

Analgesics and Antipyretics:

Antipyretics and analgesics are used to treat mild to moderate pain and fever. For rapid relief, acetaminophen should be taken.in an empty stomach because food may slow the body absorption of acetaminophen. Co-administration of acetaminophen with pectin delaya its absorption and onset." NSAIDs like ibuprofen Certain medications, such as aproxen, ketoprofen, and others, should be taken with food or milk because they can irritate the stomach. Avoid or use alcohol sparingly as prolonged alcohol consumption raises the risk of stomach bleeding and liver damage[25]. Concomitant food consumption had an impact on the absorption of oxycodone and ibuprofen when given in combination tablets. The C and AUC of ibuprofen increased significantly following single and multiple doses of Coca-Cola, indicating an increased extent of ibuprofen absorption. and multiple doses of Coca-Cola, thereby indicating increased extent of absorption of ibuprofen .The daily dosage and frequency of ibuprofen must be reduced when administered with Coca-Cola, Food intake did not appear to affect the extent of absorption (je, rotal exposure) of oral Diclofenac potassium soft gelatin capsule at doses[26].

Bronchiodilators:

Distinct bronchodilators have distinct effects when taken with meals, including as theophylline, albuterol, and epinephrine. Food can have a wide range of effects on theophylline drugs. High-far meals may increase the amount of theophylline in the body, while high- carbohydrate meals may decrease it. Avoid alcohol if taking theophylline medications because it can increase the risk of side effects such as nausea, vomiting, headache and irritability[27]. Since theophylline is a derivative of xanthine and chocolate, colas, coffee, and tea all contain xanthine, it is best to avoid consuming high amounts of these foods and beverages. Hence consuming large amounts of these substances while taking theophylline, increases the risk of drug.Additionally, both oral bronchodilators and caffeine stimulate the central nervous system. Patients may be advised. not to consume GFJ when taking theophylline, since it increases the bioavailability, and monitoring of plasma theophylline levels in patients consuming GFJ might be helpful in better management of patient care."[28].

Antidiabetics:

Glimepiride is a novel type of sulfonylurea that acts as an antidiabetic. administered with breakfast or the first substantial meal of the day. Its complete absorption and lack of food interaction ensure extremely consistent pharmacokinetic results. Take glipizide with immediate release half an hour before eating[29]. Extended release pills, however, ought to be taken first thing in the morning. When acarbose, an alpha-glucosidase inhibitor, is consumed, its

maximal effectiveness is reached. whenever a meal is about to begin (not 30 minutes beforehand or afterwards), as this will cause the alpha-glucosidase enzyme to take longer to absorb carbohydrates. [30].

Antitubercular Drugs:

Tyramine and histamine interactions have been linked to anti-tubercular medications such as isoniazid. Isoniazid-induced inhibition of monoamine oridase and histaminase can result in substantial drug-food interactions[31]. Food dramatically reduces the bioavailability of isoniazid."Oleanolic acid, a triterpenoid that is found in many foods, medicinal herbs, and other plants, exhibits synergistic effects with isoniazid when used in conjunction with its antimycobacterial action against the Mycobacterium TB.High-fat diets cause partial bacterial elimination by lowering the blood concentration of the bacteriostatic anti-tubercular medication cycloserine[32].

Antibiotic drugs:

In the practice of medicine, antibiotics are frequently prescribed. Many of them cause interactions or are prone to interactions that could reduce their effectiveness as anti-infectives or cause harmful side effects. Consumption of food can affect how effective an antibiotic is. Steer clear of administering antibiotics concurrently with milk products, as they include abundant amounts of divalent ions like calcium and magnesium, which can bind to certain antibiotics and hinder their absorption. Dairy products should, however, be consumed under strict supervision and with proper care for the particular antibiotics involved.

A number of studies demonstrate that ciprofloxacin absorption is hampered by casein and calcium found in milk, and that fluoroquinolones that form a somewhat soluble combination with dietary metal ions have lower bioavailability. The dissolution and absorption characteristics of ciprofloxacin pills were examined in relation to the interaction of five fruit juices. It was discovered that concurrent use of the GFJ can decrease the absorption of ciprofloxacin (500 mg) tablets.48 Therefore, consuming the juice containing ciprofloxacin should be avoided to prevent drug therapeutic failures and subsequent bacterial resistance due to sub-therapeutic levels of the drug in the systemic circulation.

When azithromycin is taken with meals, its absorption is reduced, which lowers its bioavailability by 43%.39 Since milk binds calcium and iron to produce insoluble chelates and affects the drug's absorption, tetracycline should be taken one hour before or two hours after meals 39.49.50. In healthy individuals, the impact of milk added to coffee or black tea on tetracycline's bioavailability was assessed. The presence of this metal ion should be carefully regulated to prevent lowering the amount of tetracycline that is available, as the results indicated that even a little amount of milk containing extremely small levels of calcium severely inhibit the drug's absorption.[3]

Drugs taken after meals may have less bioavailability due to food-drug interactions (negative food effects). On the other hand, enteric-coated pills that begin to break down in the middle to lower part of the small intestine may lessen the adverse effects of meals. Findings showed that isolating the primary drug absorption site from the food absorption site prevented food-drug interactions.

Impact of Food Drug Interaction in Patient

The person in charge of information on the medications in connection to the patient's food intake must be there[33]. Postponed. The effects of a significant drug-food interaction include either increased or decreased medication absorption. For instance, when a patient takes multiple medications at once, the absorption of the medication may be impacted[33].The drug's absorption may be slowed down or delayed by the meal. For this reason, it's recommended to take some medications empty-handed. However, certain medications are easier to handle when consumed with meals. It is always advised to consult a physician or pharmacist on when to take a medication, whether it should be taken empty-handed or with food[33]. Additional elements include the bioavailability, metabolism, and excretion of specific drugs and interaction.

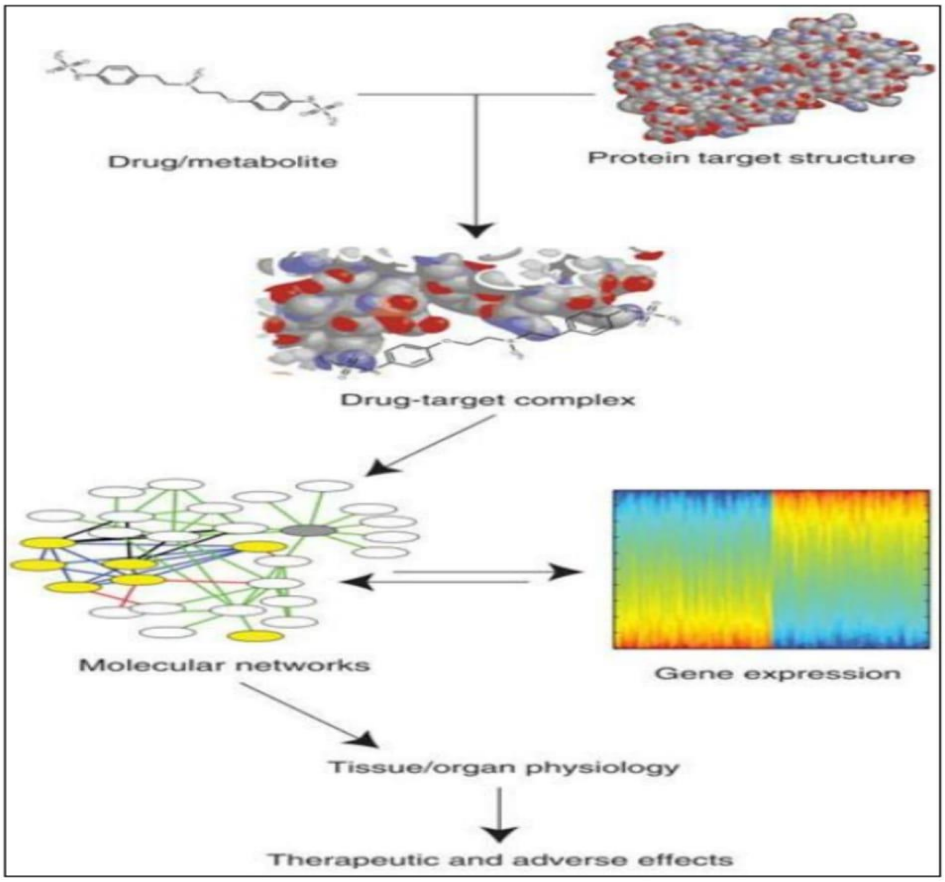

TABLE: 01.SOME FOOD –DRUG INTERCTION

Drugs	**Food**	**Drug Food Interaction**
WARFARIN	High Protiendiet Vegetables containing vitamin k Charbroiled Cooked onions Cranberry juice Leafy green vegetable Charbroiled	Raise serum albumin lev,decrease in international normalized ratio [INR] Interferes with the effectiveness ans safety of warfarin therapy Decrease warfarin activity Increase activity Elevated INR without bleeding in elderly patient Thromboembolic complication may develop Decrease warfarin activity
MONOAMNINE OXIDASES	Tyramine -containing food	Hypertensive crisis
PROPRANOLOL	Rich protien food	Serum level may be increased
CELIPROLOL	Orange juice	The intestinal absorption is inhibited
ACES INHIBITORS	Empty stomach	Absorption is increase
CA2 CHANNEL	Grape fruit juice	Increases the bioavailability
ANTIBIOTICS	With milk product	That complex with some antibiotics and prevent their

		absorption and reduced bioavailability
ACETAMINOPHEN	Pectin	Delays its absorption and onset
NSAIDS	Alcohol Beverages	Can increase risk of liver damage or stomach bleeding The C max and AUC 0-alpha significantly increased
THEOPHYLINE	High fat meal and grape fruit juice Caffeine	Increase bioavailability Increase the risk of drug toxicity
ESOMEPRAZOLE	High fat meal	Bioavailability was reduced
CIMETIDINE ,RUPATADINE	With food [any type]	Increase bioavailability
ISONIAZIDE	Plantsmedicinalherbsoleanolic acids	Exerts synergistic effect
CYCLOSERINE	High fat meals	Decrease the serum concentration
GLIMEPIRIDE	With breakfast	Absolute bioavailability
ACARBOSE	At start of each meal	Maximum effectiveness
MERCAPTOPURINE	Cows milk	Reduce bioavailability
TAMOXIFEN	Sesame seeds	Negatively interferes with tamoxifen in inducing regression of established mcf-7 tumor size but beneficially interact with tamoxifen bone in ovariectomized athymic mice
LEVOTHYROXINE	Grape fruit juice	Delay the absorption

TABLE :02.LIST OF SOME COMMON FOOOD AND DRUG INTERACTION:

Drug	Food Interacting	Effects	What to do
Analgesics/antipyretic Acetaminophen	Alcohol	Increase Liver Damage	Strictly Avoid Alcohol
Antibiotics Doxycycline ,Minocycline ,Tetracycline ,Amoxicillin,Penicillin	Dairy products,iron supplements	Decrease Drug Absorption	Do not Take With Milk ,Curd, Dairy ,Products,Iron Supplements
Azithromycin ,Nitrofurantoin	Food	Slows Down Drug Absorption	Take before 1 to 2 hr of any food

Linezolid	Food Containing Tyramin	Risk for hyprtensive crisis	Try to Avoid Tyramin containing food or take after 6 hr of drug administration
Anticoagulants Warfarin, Clopidogrel, Heparin ,Rivaroxaban,Dabigatran,Enoxaparin	Food contain Vitamin k Vitamin E	Vitamin K Decrease & vit E Increase Absorption of Drug	Limit foods high in vit k-liver,cabbage,spinach,broccoli ,cauliflower Informs your doctor if you take Vit E supplements
Narcotic Analgesics Codine +acetaminophen, Hydrocodone+ acetaminophen ,morphine	Alcohol	Alcohol can Increase the Chance of Dangerous Side Effects ,Coma or Death.	Don't drink alcohol While Using narcotics
Anti hyperlipidemis (statins) Rosuvastatin Atorvastatin	Grapefruit juice Alcohol	Can raise levels of those statins in body and increase the chance of liver damage	Don't drink graoefruit juice Totally avoid
Vitamin b12	Meat ,milk ,eggs	Vit b12 absorption decrease	Do not eat these foods with the drug
Metronidazole ,(antibiotic) Procarbazine (antineoplatic) Chlorpramide (antidiabetic)	Alcohol (major interaction)	Resulting in increase heart rate,increased b.p can take place due to drug interaction	Never take alcohol if on these drugs
Anti-inflammatory (NASID) Aspirin Diclofenac Ibuprofen Ketoprofen Naproxen	Food or milk Alcohol	Decrease g.i irritation Risk of gi bleed &liver damage	Take with food or milk Avoid
Antidepressant (moa inhibitors) Isocarboxzid Tranlcypromine Rasagiline selengiline	Tyramine	Risk for hypertensive crisis.Very serious drug food intraction	Avoid cheese,wine chocolate,cocoa,coffee,yeast.Try to avoid tyramine containing foods.
Immunosuppressant Methotrexate	Folic acid	Folic acid depletion	Take plenty of green leafy vegetables salads
Antiosteoporotics (calcium metabolism modifier)Alendronate	Caffeine Vitamin C	Reduction in absorption	Take with a gap of 2-3 hrs With food ,juices & beverages
Calcium supplements	Dairy products	Inhibition due to chelation	Take on an empty stomach with a gap of 1-2hrs between meals / dairy products
Iron supplements	Tea ,Coffee ,fiber,vitamin C	Inhibition iron absorption Promotes iron absorption	Do not take with tea ,coffee,salads,whole grains Take wuth fruits ,juice add lime,tomatoes ,green chilies to food
Antihistamines Cetrizines ,Chlorphenarimne ,Diphenhydramine,Fexofenadine ,Levocetrizine	Alcohol	Increases drowsiness	Abstain from taking alcohol

TABLE : 03 .FOOD-DRUG INTERACTION

Food	**mechanism**	**Drug interaction and clinical considerations**	**recommendation**
Grapefruit	Inhibits CYP3A4,	• Amiodarone (50%	Avoid this combination

	CYP1A2, P-gp	increase in AUC) • Apixaban (potential for bleeding) • Buspirone (increase absorption) • Calcium channel blockers (potential for tachycardia, hypotension) • Carbamazepine (increase in AUC • Colchicine (increase in AUC) • Cyclosporine (increase in AUC) • Darifenacin (potential for urinary retention, constipation) • Dextromethorphan (increase in AUC) • Eplerenone (potential for hyperkalemia, arrhythmias) • Erythromycin (potential for torsades de pointes) • Fentanyl patch (potential for respiratory depression) • Fesoterodine (potential for urinary retention, constipation) • Levothyroxine (increase in AUC) • Lovastatin (potential for muscle pain) • Oxycodone (increase in peak, increase in AUC, prolonged half-life) • Quetiapine (increased CNS effects) • Rivaroxaban (potential for bleeding) • Simvastatin (potential for muscle pain) • Sirolumus (potential for myelotoxicity, nephrotoxicity) • Tacrolimus (potential for nephrotoxicity) • Tamsulosin (potential for orthostatic hypotension) • Ticagrelor (potential for bleeding)	

		• Ziprasidone (potential for torsades de pointes)	
Foods high in vitamin K (broccoli, cabbage, spinach, Brussels sprouts)	Inhibits CYP 1A1, CYP 3A4	• Warfarin	Maintain consistent intake of green leafy vegetables and vitamin supplements containing vitamin K
Foods high in tyramine (aged cheese, processed meats, wine, bee	Tyramine accumulates and leads to hypertensive crisis.	• Phenelzine • Isocarboxazid • Tramylcypromine • Isoniazid • Linezolid	Avoid this combination

Prevention of Drug Food Interaction:

The following information can be given to the patients while dispensing the medicine:

- Read the label on the medicine container. And try to get more information about the medicine from the physician or pharmacist.
- Avoid over-the-counter medications without proper knowledge about it. Read the precaution mention on the labels[35].
- Vitamins and minerals can get interact with some drugs. So avoid taking vitamin pills concomitantly along with other medicines. And contact with physician or clinical pharmacist.
- Avoid taking medicine with hot drinks because the heat can destroy the effectiveness of the drug.
- Avoid taking any medicine with alcoholic drinks, also not with any other beverages or juices without instruction of physician.
- Relate with clinical pharmacist to know about the food which affect with the medicines you have been prescribed)[36].
- Consult with clinical pharmacist to modify the administration timing and dosage intervals to avoid any kind of suspected interactions
- Patient counseling and patient education by clinical pharmacists/Pharmacologists and community pharmacists can reduce the drug food interaction[37].

Conclusion

Every year, a significant number of new medications are launched. Food-drug interactions may have detrimental impacts on the patient's nutritional state in addition to compromising the safety and effectiveness of medication therapy. Drug interactions should generally be avoided because they may have unanticipated or negative results. Medication administered orally has to pass through the stomach or small intestinal lining in order to be absorbed, much like food. As a result, food in the digestive system may lessen a drug's absorption.

If the medication is taken an hour before or two hours after eating, these interactions are frequently avoidable. Foods may interact with prescription or over-the-counter medications as they are not subjected to the same thorough testing as pharmaceuticals. In order to prevent interactions, the authors advise patients to inform their physicians and pharmacists about the foods they consume and any dietary supplements they may be taking.Every year, a huge number of new medications are launched. Food-drug interactions may have detrimental impacts on the patient's nutritional state in addition to compromising the safety and effectiveness of medication therapy. Drug interactions should generally be avoided because they may have unanticipated or negative results. Medication administered orally has to pass through the stomach or small intestinal lining in order to be absorbed, much like food. As a result, food in the digestive system may lessen a drug's absorption. If the medication is taken an hour before or two hours after eating, these interactions are frequently avoidable. Foods and prescription or over-the-counter medications may interact since they are not subjected to the same thorough testing as pharmaceuticals. In order to prevent interactions, the authors advise patients to inform their physicians and pharmacists about the foods they consume and any dietary supplements they may be taking.

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