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I would like to extend my heartfelt congratulations to the entire **The Galen, A Pharmacy Magazine** team for your outstanding efforts and dedication. Your hard work, passion, and commitment to excellence are truly evident in the quality and impact of your publication. You have played a vital role in advancing knowledge, sharing insights, and fostering collaboration within the pharmacy community. I am also very happy and enthusiastic to become a part of team. Keep up the fantastic work, and may your continued efforts inspire and educate many more professionals in the field. Well done!

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Article 1:**A COMPREHENSIVE OVERVIEW OF THROMBOTIC AND CARDIOVASCULAR DISORDERS: CAUSES, SYMPTOMS, AND MANAGEMENT****Author Name: Dr. Satish Kumar Sarankar, Professor & Principal****Affiliation:** Faculty of Pharmacy, Mansarovar Global University, Bilkisgnj, Sehore, MP-466111**Email:** satish_sarankar@yahoo.co.in

Abstract: Cardiovascular and thrombotic disorders, including coronary artery disease (CAD), heart failure, arrhythmias, hypertension, deep vein thrombosis (DVT), and pulmonary embolism (PE), are leading causes of morbidity and mortality globally. This review provides a comprehensive overview of these conditions, exploring their causes, symptoms, and current management strategies. CAD is primarily driven by atherosclerosis, presenting with symptoms such as angina and myocardial infarction, and managed through lifestyle changes, medications, and interventional procedures. Heart failure, resulting from conditions like hypertension and myocardial infarction, manifests with symptoms like dyspnea and edema, requiring treatments ranging from diuretics to advanced surgical interventions. Arrhythmias, caused by various factors including electrolyte imbalances and heart disease, are treated with medications, lifestyle modifications, and devices like pacemakers. Hypertension, a major risk factor for other cardiovascular disorders, is managed through dietary changes, physical activity, and antihypertensive drugs. Thrombotic disorders such as DVT and PE are caused by prolonged immobility, surgery, and genetic factors, and are treated with anticoagulants and lifestyle adjustments. This review highlights the importance of understanding these disorders' multifaceted nature and the advances in therapeutic approaches, underscoring the need for ongoing research and innovation to improve patient outcomes

Key Words: Coronary Artery Disease (CAD), Heart Failure, Arrhythmias, Hypertension, Deep vein thrombosis (DVT), and Pulmonary Embolism (PE)

Introduction: Thrombotic and cardiovascular disorders are significant contributors to global morbidity and mortality, encompassing conditions such as coronary artery disease (CAD), stroke, deep vein thrombosis (DVT), and pulmonary embolism (PE). These disorders are primarily characterized by the formation of blood clots, which can obstruct blood flow and lead to severe health complications. Effective management of these conditions requires a multidisciplinary approach involving pharmacotherapy, interventional procedures, and lifestyle modifications. This review aims to provide a detailed overview of current management strategies,

emerging trends, and the challenges faced in treating thrombotic and cardiovascular disorders.

Thrombotic Disorders: Causes, Symptoms, and Associated Problems:

Thrombotic disorders encompass a range of conditions where abnormal clotting leads to significant morbidity and mortality. This section delves into the causes, symptoms, and associated problems of key thrombotic disorders, including Deep Vein Thrombosis (DVT), Pulmonary Embolism (PE), and arterial thrombosis such as Coronary Artery Disease (CAD) and ischemic stroke.

Deep Vein Thrombosis (DVT): Deep Vein Thrombosis (DVT) occurs when a blood clot forms in the deep veins, usually in the legs. The primary causes of DVT include prolonged immobility, such as during long flights or bed rest, which leads to stagnant blood flow. Surgical procedures, particularly those involving the lower extremities, and trauma can also precipitate DVT. Cancer and its treatments increase the risk of thrombosis due to hypercoagulability. Genetic predispositions, such as Factor V Leiden mutation, and acquired conditions like antiphospholipid syndrome, also contribute to the risk of developing DVT. Pregnancy, hormone replacement therapy, and oral contraceptives are additional risk factors.

The symptoms of DVT can be subtle or pronounced. Common signs include swelling in one leg, pain or tenderness that might feel like a cramp, and redness or discoloration of the skin. The affected area may also feel warm to the touch. If the clot is large, it can cause significant discomfort and swelling. A major complication of DVT is Pulmonary Embolism (PE), where the clot dislodges and travels to the lungs, causing a potentially fatal blockage in the pulmonary arteries. Chronic complications include post-thrombotic syndrome, characterized by long-term pain, swelling, and, in severe cases, leg ulcers due to damaged veins and poor blood flow.

Pulmonary Embolism (PE): Pulmonary Embolism (PE) typically results from a DVT clot that dislodges and travels through the bloodstream to the lungs. Other less common causes include fat embolism from bone fractures, amniotic fluid embolism during childbirth, & air embolism from medical procedures. Symptoms of PE can vary based on the size of the clot and the area of the lung it affects. Common symptoms include sudden onset of shortness of breath, chest pain that may worsen with deep breathing, coughing (sometimes with bloody sputum), rapid or irregular heartbeat, and lightheadedness or fainting. Severe cases can lead to collapse & sudden death. PE can lead to serious complications such as hypoxemia (low blood

oxygen levels), right-sided heart failure due to increased pressure in the arteries pulmonary arteries (pulmonary hypertension), and sudden death if the embolism is large and obstructs a major part of the lung circulation.

Arterial Thrombosis

Coronary Artery Disease (CAD): Coronary Artery Disease (CAD) occurs due to atherosclerosis, where plaques made up of fat, cholesterol, and other substances build up in the coronary arteries. Risk factors for CAD include hypertension, hyperlipidemia, diabetes, smoking, a sedentary lifestyle, and genetic predisposition. Symptoms of CAD include chest pain or discomfort (angina), which may radiate to the arms, neck, jaw, shoulder, or back. Other symptoms include shortness of breath, fatigue, and in severe cases, myocardial infarction (heart attack), which presents as severe chest pain, sweating, nausea, and vomiting.

CAD can lead to heart failure due to the heart's inability to pump blood effectively, arrhythmias (irregular heartbeats), and sudden cardiac death. Chronic CAD can result in angina and reduced quality of life due to persistent chest pain and limitations in physical activity.

Ischemic Stroke: Ischemic stroke is caused by a clot obstructing blood flow to the brain. The most common causes include atherosclerosis, where plaques narrow the arteries supplying the brain, and embolism, where clots from other parts of the body (often the heart, in cases of atrial fibrillation) travel to the cerebral arteries. Symptoms of ischemic stroke are sudden and include numbness or weakness, particularly on one side of the body, confusion, trouble speaking or understanding speech, visual disturbances, dizziness, loss of balance or coordination, and severe headache with no known cause.

The consequences of ischemic stroke can be devastating and include permanent neurological deficits, cognitive impairment, and significant disability, affecting mobility, speech, and daily functioning. Stroke survivors often require long-term rehabilitation and may experience reduced quality of life.

Thrombotic disorders, encompassing DVT, PE, and arterial thrombosis such as CAD and ischemic stroke, present significant health challenges. Understanding the causes, recognizing the symptoms, and being aware of associated complications are critical for effective management. Advances in pharmacotherapy, interventional procedures, and lifestyle modifications have significantly improved patient outcomes, but ongoing research and innovation

remain essential to address the remaining challenges in this field.

Cardiovascular Disorders: Causes, Symptoms, and Management:

Cardiovascular disorders are among the leading causes of death and disability worldwide. These disorders include a range of conditions affecting the heart and blood vessels, such as coronary artery disease (CAD), heart failure, arrhythmias, and hypertension.

Heart Failure: Heart failure, also known as congestive heart failure, occurs when the heart is unable to pump sufficient blood to meet the body's needs. It can result from various conditions that damage or overwork the heart muscle, including CAD, hypertension, myocardial infarction, cardiomyopathy, and valvular heart disease. Symptoms of heart failure include shortness of breath, especially during physical activity or while lying flat, fatigue, weakness, swelling in the legs, ankles, and feet (edema), rapid or irregular heartbeat, reduced ability to exercise, persistent cough or wheezing, and increased need to urinate at night. Severe cases may lead to ascites (abdominal swelling), rapid weight gain from fluid retention, and difficulty concentrating.

Heart failure management aims to alleviate symptoms, improve quality of life, and reduce hospitalizations. Treatment includes lifestyle modifications such as reducing salt intake, maintaining a healthy weight, and regular physical activity. Medications include diuretics to reduce fluid buildup, ACE inhibitors or ARBs to lower blood pressure and decrease heart workload, beta-blockers to reduce heart rate and improve heart function, and aldosterone antagonists. In severe cases, advanced therapies such as implantable cardioverter-defibrillators (ICDs), cardiac resynchronization therapy (CRT), ventricular assist devices (VADs), or heart transplantation may be necessary.

Arrhythmias: Arrhythmias are irregular heartbeats that can result from various factors, including coronary artery disease, electrolyte imbalances, changes in heart muscle (cardiomyopathy), injury from a heart attack, and healing after heart surgery. Other causes include hyperthyroidism, certain medications, excessive alcohol consumption, and stress. Arrhythmia symptoms vary depending on the type and severity of the irregular heartbeat. Common symptoms include palpitations (feeling of skipped heartbeats or fluttering), dizziness, shortness of breath, chest pain, and fainting. Some arrhythmias may not cause any noticeable symptoms but can be detected during a physical examination or with an electrocardiogram (ECG).

Management of arrhythmias depends on the type and severity of the condition.

condition. Treatment options include lifestyle changes, medications, and procedures. Lifestyle modifications involve reducing caffeine and alcohol intake, managing stress, and avoiding smoking. Medications such as beta-blockers, calcium channel blockers, antiarrhythmic drugs, and anticoagulants are used to control heart rate, rhythm, and prevent blood clots. Interventional procedures include electrical cardioversion, catheter ablation, and the implantation of pacemakers or ICDs.

Hypertension: Hypertension, or high blood pressure, can develop due to a variety of factors. Primary hypertension, which has no identifiable cause, is influenced by genetics, age, diet, and lifestyle. Secondary hypertension results from underlying conditions such as kidney disease, hormonal disorders, sleep apnea, and certain medications. Hypertension is often called the "silent killer" because it usually has no symptoms until significant damage has occurred. When symptoms do appear, they may include headaches, shortness of breath, nosebleeds, and chest pain. Persistent hypertension increases the risk of heart attack, stroke, heart failure, and kidney disease.

Managing hypertension involves lifestyle modifications and medications. Lifestyle changes include adopting a low-sodium, heart-healthy diet (such as the DASH diet), regular physical activity, maintaining a healthy weight, limiting alcohol intake, and quitting smoking. Medications used to treat hypertension include diuretics, ACE inhibitors, ARBs, calcium channel blockers, beta-blockers, and other antihypertensive agents.

Cardiovascular disorders such as coronary artery disease, heart failure, arrhythmias, and hypertension are prevalent and pose significant health risks. Understanding the causes, recognizing the symptoms, and implementing effective management strategies are crucial in reducing morbidity and mortality associated with these conditions. Advances in pharmacotherapy, interventional procedures, and lifestyle modifications have significantly improved patient outcomes. However, continued research and innovation are essential to address the ongoing challenges in cardiovascular care and enhance the quality of life for affected individuals.

Current Management Strategies

Antiplatelet Therapy: Antiplatelet drugs prevent platelets from aggregating and forming clots. Common agents include:

Drug	Mechanism	Use Case
Aspirin	Inhibits COX-1, reducing thromboxane A2	Primary/secondary prevention
Clopidogrel	P2Y12 receptor inhibitor	Used with aspirin post-PCI
Ticagrelor	TicagrelorPotent P2Y12 inhibitor	Acute coronary syndrome

Anticoagulation Therapy: Anticoagulants prevent clot formation and are crucial in managing atrial fibrillation, DVT, and PE. Major classes include:

Drug Class	Mechanism	Use Case
Vitamin K Antagonists	Inhibits COX-1, reducing thromboxane A2	Requires regular INR monitoring
Direct Oral Anticoagulants	Apixaban, Rivaroxaban, Dabigatran	Fixed dosing, fewer interactions
Low Molecular Weight Heparin	Enoxaparin, Dalteparin	Used in acute settings, bridging therapy

Interventional Procedures

1. Percutaneous Coronary Intervention (PCI): Involves the insertion of a stent to open up blocked coronary arteries. Drug-eluting stents release medication to prevent restenosis.
2. Thrombolysis: The administration of clot-dissolving drugs like alteplase is critical in the management of acute ischemic stroke and massive PE. Timely intervention is crucial to maximize benefits and minimize complications.
3. Mechanical Thrombectomy: An emerging treatment for acute ischemic stroke, where mechanical devices are used to remove large clots from cerebral arteries.

Emerging Trends and Research

Precision Medicine: Genetic and biomarker profiling is increasingly used to tailor antiplatelet and anticoagulant therapies. For example, patients with certain CYP2C19 polymorphisms may have reduced response to clopidogrel, necessitating alternative therapies like ticagrelor or prasugrel.

Novel Antithrombotic Agents: New drugs are being developed to offer better efficacy and safety profiles. Factor XI inhibitors, such as osocimab and abelacimab, are in clinical trials and show promise in reducing thrombotic

events with lower bleeding risks.

Non-Pharmacological Approaches

1. **Structural Interventions:** Left atrial appendage closure devices (e.g., Watchman device) are used to reduce stroke risk in patients with atrial fibrillation who are unsuitable for long-term anticoagulation.
2. **Lifestyle Modifications:** Encouraging patients to adopt healthier lifestyles through diet (e.g., Mediterranean diet), regular exercise, smoking cessation, and weight management is critical in reducing cardiovascular risk factors.

Challenges in Management

Balancing Efficacy and Safety: One of the primary challenges is balancing the antithrombotic efficacy of treatments with the associated bleeding risks. This is particularly important in elderly patients and those with comorbid conditions.

Cost and Accessibility: The high cost of newer antithrombotic agents and interventions can limit accessibility, especially in low-resource settings. Efforts are needed to improve affordability and distribution of these therapies.

Long-term Adherence: Ensuring long-term adherence to antithrombotic therapy is essential to prevent recurrent thrombotic events. Strategies include patient education, simplifying dosing regimens, and using combination pills where possible.

Future Directions

1. **Development of Safer Antithrombotic Agents:** Ongoing research aims to develop drugs with a lower risk of bleeding, such as factor XI inhibitors and novel anticoagulants targeting specific pathways involved in clot formation.
2. **Enhanced Monitoring and Follow-up:** Technological advancements, such as wearable devices and telemedicine, can improve monitoring of patients on antithrombotic therapy, ensuring better adherence and timely management of complications.
3. **Personalized Treatment Plans:** Continued research into pharmacogenetics and biomarker-driven therapy will enhance the ability to personalize treatment plans, optimizing outcomes for individual patients.

Conclusion

The management of thrombotic and cardiovascular disorders is a complex and evolving field. Advances in pharmacotherapy, interventional procedures, and personalized medicine have significantly improved patient outcomes. However, challenges such as balancing efficacy and safety, ensuring cost-effectiveness, and promoting long-term adherence remain. Ongoing research and innovation are essential to address these challenges and continue improving the care and outcomes for patients with thrombotic and cardiovascular disorder.

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Article 2:

A Comprehensive Review of Management of Cardiovascular and Thrombotic Diseases

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Abstract

Cardiovascular and thrombotic diseases represent significant public health challenges worldwide, contributing substantially to morbidity and mortality rates. This comprehensive review delves into the multifaceted management strategies for these conditions, encompassing lifestyle modifications, pharmacotherapy, and interventional procedures. The review highlights the latest evidence-based practices and emerging trends in the field.

Introduction

Background and Epidemiology

Cardiovascular diseases (CVDs) and thrombotic disorders represent some of the most pressing health challenges globally. CVDs include a broad spectrum of conditions affecting the heart and blood vessels, such as coronary artery disease (CAD), heart failure (HF), and hypertension. Thrombotic diseases, including deep vein thrombosis (DVT) and pulmonary embolism (PE), often complicate or occur alongside cardiovascular conditions. Together, these diseases contribute significantly to the global burden of morbidity and mortality.

According to the World Health Organization (WHO), cardiovascular diseases remain the leading cause of death worldwide, accounting for approximately 32% of all global deaths. The prevalence of CVDs is influenced by factors such as aging populations, urbanization, and lifestyle changes. Thrombotic diseases, though less commonly discussed, also pose significant health risks, particularly in patients with pre-existing cardiovascular conditions or those undergoing major surgeries.

Definition and Classification Cardiovascular Diseases:

Cardiovascular diseases are characterized by conditions that impair the function of the heart and blood vessels. Key types include:

Coronary Artery Disease (CAD): Results from the buildup of plaque in the coronary arteries, leading to reduced blood flow to the heart muscle and potentially resulting in angina or myocardial infarction (MI).

Heart Failure (HF): A condition where the heart is unable to pump effectively, leading to symptoms like dyspnea, edema, and fatigue. HF can be classified into left-sided, right-sided, or congestive heart failure.

Hypertension: Defined by persistently elevated blood pressure, which increases the risk of stroke, heart attack, and renal failure.

Thrombotic Diseases:

Thrombotic disorders involve the formation of blood clots that can obstruct blood flow. Major types include:

Deep Vein Thrombosis (DVT): The formation of a blood clot in a deep vein, usually in the legs. It can lead to complications such as PE if the clot dislodges and travels to the lungs.

Pulmonary Embolism (PE): A blockage in one of the pulmonary arteries in the lungs, often resulting from a clot that has traveled from the legs or other parts of the body.

Objectives of the Review

The primary objective of this review is to provide a comprehensive overview of the management strategies for cardiovascular and thrombotic diseases. This includes an examination of:

1. Lifestyle Modifications: The role of diet, physical activity, smoking cessation, and alcohol moderation in the prevention and management of these diseases.

Pharmacotherapy: Current medications used to manage hypertension, dyslipidemia, and thrombotic events, including their mechanisms, efficacy, and safety.

Interventional Procedures: The use of techniques such as percutaneous coronary intervention (PCI), coronary artery bypass grafting (CABG), and thrombectomy in the treatment of severe cardiovascular and thrombotic conditions.

Emerging Therapies and Future Directions: Innovations in drug development, personalized medicine, and technological advancements that may influence future management strategies.

Lifestyle Modifications

Lifestyle modifications are fundamental to the prevention and management of cardiovascular and thrombotic diseases. Adopting healthy behaviors can significantly reduce risk factors, improve overall health, and complement pharmacological and interventional treatments. This section explores key lifestyle modifications, including dietary changes, physical activity, smoking cessation, and alcohol moderation, and examines their impact on cardiovascular and thrombotic health.

Sodium intake to less than 2,300 mg per day, with an ideal limit of 1,500 mg per day for those with hypertension.

Physical Activity

Exercise Recommendations: Regular physical activity is a cornerstone of cardiovascular health. Key recommendations include:

Aerobic Exercise: Engaging in moderate-intensity aerobic exercise, such as brisk walking, cycling, or swimming, for at least 150 minutes per week or 75 minutes of vigorous-intensity exercise, is beneficial. Aerobic exercise improves cardiovascular fitness, lowers blood pressure, and enhances lipid profiles.

Resistance Training: Incorporating resistance exercises, such as weight lifting or body-weight exercises, at least two days per week helps improve muscle strength and metabolic health. Resistance training can complement aerobic exercise and contribute to overall cardiovascular health.

Smoking Cessation

Health Risks of Smoking: Smoking is a major modifiable risk factor for cardiovascular and thrombotic diseases. It contributes to the development of atherosclerosis, increases the risk of myocardial infarction, stroke, and peripheral artery disease, and exacerbates existing cardiovascular conditions.

Cessation Strategies: Effective smoking cessation strategies include:

Behavioral Therapy: Counseling and support groups provide behavioral

strategies to help individuals quit smoking and maintain abstinence.

Pharmacotherapy: Nicotine replacement therapy (NRT), such as patches, gum, and lozenges, as well as prescription medications like bupropion and varenicline, can aid in smoking cessation.

Alcohol Consumption

Moderation Guidelines: Moderation of alcohol intake is important for cardiovascular health. The American Heart Association defines moderate alcohol consumption as up to one drink per day for women and up to two drinks per day for men. Excessive alcohol consumption is linked to hypertension, arrhythmias, cardiomyopathy, and an increased risk of thrombotic events.

Impact on Cardiovascular Health: Positive Effects: Moderate alcohol consumption, particularly of red wine, has been associated with beneficial effects on cardiovascular health due to its polyphenol content. However, these potential benefits must be weighed against the risks of excessive consumption.

Negative Effects: Heavy alcohol use increases the risk of hypertension, heart failure, and atrial fibrillation. It also contributes to weight gain and metabolic syndrome, further exacerbating cardiovascular risk.

Intervention Strategies: Intervention strategies for managing alcohol consumption include:

Screening and Brief Interventions: Healthcare providers can screen for alcohol use and provide brief interventions to encourage moderation or cessation.

2. Pharmacotherapy

Pharmacotherapy is a cornerstone of managing cardiovascular and thrombotic diseases, addressing key pathophysiological processes and risk factors. This section provides an in-depth review of the primary classes of medications used in treating these conditions, including antihypertensives, antiplatelet agents, anticoagulants, and lipid-lowering agents. We will explore their mechanisms of action, clinical indications, efficacy, safety profiles, and recent advancements

Antihypertensive Medications Classes of Medications:

Angiotensin II Receptor Blockers (ARBs):

Mechanism of Action: ARBs, such as losartan, valsartan, and candesartan, block the action of angiotensin II at its receptor sites, leading to vasodilation and reduced blood pressure. Unlike ACE inhibitors, ARBs do not typically cause cough.

Clinical Indications: Used for hypertension, heart failure, and in patients intolerant to ACE inhibitors. They are also beneficial in diabetic nephropathy and chronic kidney disease.

Beta-Blockers:

Mechanism of Action: Beta-blockers, such as metoprolol, atenolol, and carvedilol, reduce heart rate and myocardial contractility by blocking beta-adrenergic receptors. This results in decreased cardiac output and blood pressure.

Clinical Indications: Indicated for hypertension, heart failure, angina, and post-M I. They also play a role in controlling arrhythmias and managing chronic obstructive pulmonary disease (COPD) in some cases.

Calcium Channel Blockers (CCBs):

Mechanism of Action: CCBs, such as amlodipine, diltiazem, and verapamil, inhibit calcium entry into cardiac and smooth muscle cells, leading to vasodilation and reduced cardiac workload.

Clinical Indications: Used for hypertension, angina, and certain types of arrhythmias. They are also helpful in managing Raynaud's phenomenon.

Antiplatelet Agents

Aspirin: Mechanism of Action: Aspirin irreversibly inhibits cyclooxygenase-1 (COX-1), leading to decreased thromboxane A₂ production and reduced platelet aggregation.

Clinical Indications: Used for primary and secondary prevention of myocardial infarction, stroke, and in patients with peripheral artery disease.

Efficacy and Safety: Aspirin effectively reduces the risk of thrombotic events. Common side effects include gastrointestinal bleeding and ulceration. Recent studies have questioned the benefit of aspirin for primary prevention in low-risk populations.

P2Y12 Inhibitors:

Clopidogrel: Mechanism of Action: Clopidogrel irreversibly inhibits the P2Y12 receptor on platelets, preventing platelet activation and aggregation.

Clinical Indications: Used in acute coronary syndrome, after PCI with stent placement, and for secondary prevention of cardiovascular events.

Efficacy and Safety: Clopidogrel reduces cardiovascular events and improves outcomes in patients with CAD. Side effects include bleeding and gastrointestinal discomfort.

Anticoagulants

Warfarin: Mechanism of Action: Warfarin inhibits vitamin K epoxide reductase, leading to a reduction in vitamin K-dependent clotting factors (II, VII, IX, and X) and anticoagulation.

Clinical Indications: Used for atrial fibrillation, venous thromboembolism (VTE), and mechanical heart valves.

Efficacy and Safety: Warfarin is effective in preventing thrombotic events but requires regular monitoring of INR levels to manage bleeding risks and ensure therapeutic efficacy. Adverse effects include bleeding complications and interactions with food and other medications.

Direct Oral Anticoagulants (DOACs):

Types and Mechanism of Action: DOACs, including rivaroxaban, apixaban, edoxaban, and dabigatran, target specific clotting factors (e.g., factor Xa or thrombin) and offer more predictable anticoagulation compared to warfarin.

Clinical Indications: Indicated for atrial fibrillation, VTE, and in some cases, for the prevention of stroke and systemic embolism.

Efficacy and Safety: DOACs are associated with a lower risk of major bleeding compared to warfarin and do not require routine monitoring. However, they are contraindicated in patients with severe renal impairment and may have specific drug interactions.

Lipid-Lowering Agents

Statins: Mechanism of Action: Statins, such as atorvastatin, simvastatin, and rosuvastatin, inhibit HMG-CoA reductase, leading to decreased cholesterol synthesis and increased clearance of LDL cholesterol.

Clinical Indications: Used for managing dyslipidemia and reducing cardiovascular risk in primary and secondary prevention.

Efficacy and Safety: Statins are highly effective in lowering LDL cholesterol and reducing cardiovascular events. Common side effects include myopathy, elevated liver enzymes, and a small risk of diabetes. Recent studies, such as the IM PROVE-IT trial, confirm their benefit in reducing cardiovascular events.

3. Interventional Procedures

Interventional procedures play a critical role in the management of cardiovascular and thrombotic diseases, especially when pharmacotherapy and lifestyle modifications are insufficient. These procedures are aimed at directly addressing anatomical and physiological abnormalities to improve blood flow, restore normal cardiac function, and prevent further complications. This section explores key interventional techniques, including percutaneous coronary interventions (PCI), coronary artery bypass grafting (CABG), thrombectomy, and novel interventions, highlighting their indications, techniques, outcomes, and recent advancements.

Percutaneous Coronary Intervention (PCI)

Overview: Percutaneous coronary intervention (PCI) is a minimally invasive procedure used to treat obstructive coronary artery disease (CAD). It involves the use of a catheter to open blocked or narrowed coronary arteries and restore blood flow to the heart muscle.

Techniques:

Angioplasty: Balloon angioplasty involves inflating a balloon within the narrowed segment of the artery to compress the atherosclerotic plaque and widen the vessel. This technique can be used alone or in conjunction with stent placement.

Stenting: Following balloon angioplasty, a stent, which is a small metal mesh tube, is deployed to keep the artery open. Drug-eluting stents (DES) release medication to prevent restenosis (re-narrowing of the artery) and have largely replaced bare-metal stents (BMS) in many clinical scenarios.

Indications: Acute Coronary Syndrome (ACS): PCI is the preferred treatment for ST-elevation myocardial infarction (STEMI) and is also used for non-ST-elevation myocardial infarction (NSTEMI) and unstable angina.

Recent Advancements: New Stent Technologies: The development of biodegradable stents and advanced drug-eluting stents with improved biocompatibility and reduced thrombosis rates.

Imaging Techniques: Enhanced imaging modalities, such as intravascular ultrasound (IVUS) and optical coherence tomography (OCT), assist in better stent placement and assessment of vessel characteristics.

Coronary Artery Bypass Grafting (CABG)

Overview: Coronary artery bypass grafting (CABG) is a surgical procedure used to bypass blocked coronary arteries using grafts, usually taken from the patient's own veins or arteries. This procedure is designed to restore adequate blood flow to the heart muscle.

Techniques:

Traditional CABG: Involves open-heart surgery with the use of a heart-lung machine to take over the function of the heart and lungs during the procedure.

Off-Pump CABG: Performed without the use of a heart-lung machine, allowing for direct grafting on a beating heart. This approach may reduce complications related to cardiopulmonary bypass.

Indications: Severe CAD: CABG is indicated in patients with significant left main coronary artery disease, multivessel disease, or when PCI is not feasible or has failed.

Symptomatic Relief: It is used to relieve symptoms of angina and improve quality of life in patients with severe coronary disease.

Efficacy and Safety:

Clinical Outcomes: CABG has been shown to improve survival rates, reduce symptoms of angina, and improve exercise tolerance. The benefits are well-documented in studies such as the Bypass Angioplasty Revascularization Investigation (BARI) and the SYNTAX trials.

Complications: Potential complications include wound infections, graft failure, arrhythmias, and cognitive dysfunction. Post-operative care and advancements in surgical techniques have reduced the incidence of complications.

Recent Advancements: Minimally Invasive Techniques: The development of

minimally invasive CABG techniques, including endoscopic and robotic-assisted approaches, which offer reduced recovery times and fewer complications.

Graft Materials: Research into the use of synthetic grafts and new biological materials aims to improve long-term graft patency and patient outcomes.

Novel Interventions

Techniques:

Transcatheter Aortic Valve Replacement (TAVR): A minimally invasive procedure to replace a diseased aortic valve with a prosthetic valve. Indicated for patients with severe aortic stenosis who are at high surgical risk.

Left Atrial Appendage Occlusion (LAAO): Used to reduce the risk of stroke in patients with atrial fibrillation by occluding the left atrial appendage, where thrombi often form.

Indications:

TAVR: Indicated for patients with symptomatic severe aortic stenosis who are at high risk for traditional valve surgery.

LAAO: Indicated for patients with non-valvular atrial fibrillation who are at high risk for stroke and have contraindications to long-term anticoagulation

Efficacy and Safety:

Clinical Outcomes: Both TAVR and LAAO have shown significant benefits in improving patient outcomes and quality of life. The PARTNER trial demonstrated TAVR's efficacy in reducing mortality and improving functional status.

Complications: Potential risks include valve migration, vascular complications, and device-related thromboembolism. Continued innovation and refinement of techniques aim to improve safety and efficacy.

5. Emerging Therapies and Future Directions

The field of cardiovascular and thrombotic disease management is rapidly evolving, with emerging therapies and innovative research driving significant changes in treatment paradigms. This section explores the latest advancements in therapy, including novel pharmacological agents, new

interventional techniques, and cutting-edge technologies. It also discusses future directions in research and the potential for personalized medicine to revolutionize the management of these conditions.

Novel Pharmacological Agents

PCSK9 Inhibitors:

Mechanism of Action: PCSK9 inhibitors, such as alirocumab and evolocumab, target and inhibit the PCSK9 protein, which is involved in the degradation of LDL receptors. By preventing this degradation, these agents increase the availability of LDL receptors on liver cells, thereby enhancing LDL cholesterol clearance from the bloodstream.

Clinical Impact: PCSK9 inhibitors have shown significant efficacy in lowering LDL cholesterol levels and reducing cardiovascular events in high-risk populations. They are particularly beneficial for patients who are statin-intolerant or have genetic conditions like familial hypercholesterolemia.

Future Directions: Ongoing research is exploring the long-term safety and cost-effectiveness of PCSK9 inhibitors and their potential role in broader patient populations.

2. RNA-Based Therapies:

Small Interfering RNA (siRNA) and Antisense Oligonucleotides:

These therapies aim to target specific genes involved in lipid metabolism and thrombotic processes. For example, inclisiran, a siRNA-based therapy, inhibits PCSK9 production, offering a novel approach to lowering LDL cholesterol.

Clinical Impact: Early studies have demonstrated that RNA-based therapies can achieve substantial reductions in LDL cholesterol and improve outcomes in cardiovascular disease.

Future Directions: Research is ongoing to refine these therapies, improve their delivery mechanisms, and assess their long-term safety and efficacy.

3. New Antithrombotic Agents: Factor XI Inhibitors: Agents such as asundexian and abelacimab target factor XI, a key player in the coagulation cascade. By inhibiting factor XI, these drugs offer a novel approach to reducing thrombotic events with potentially lower bleeding risks compared to traditional anticoagulants.

Clinical Impact: Early trials suggest that factor XI inhibitors may offer effective anticoagulation with fewer bleeding complications, particularly in patients with atrial fibrillation and venous thromboembolism.

Future Directions: Further research is needed to establish the optimal dosing, safety profiles, and long-term outcomes of factor XI inhibitors.

Innovative Interventional Techniques

1. Transcatheter Valve Therapies:

TAVR Expansion: The indications for transcatheter aortic valve replacement (TAVR) are expanding beyond high-risk patients to include intermediate- and low-risk populations. Advances in valve technology and procedural techniques are contributing to broader applicability.

Mitral Valve Repair: New technologies for transcatheter mitral valve repair and replacement are being developed to address mitral valve insufficiency and stenosis. Devices such as the MitraClip have shown promise in treating patients who are not suitable for surgical intervention.

2. Novel Coronary Intervention Devices:

Bioabsorbable Stents: Research into bioabsorbable or biodegradable stents aims to provide temporary support to the artery while minimizing long-term risks associated with permanent metallic stents, such as late stent thrombosis.

Enhanced Imaging and Guidance: Advances in imaging technologies, including optical coherence tomography (OCT) and intravascular ultrasound (IVUS), offer improved visualization of coronary lesions and stent placement, potentially enhancing procedural outcomes.

Emerging Technologies

1. Artificial Intelligence (AI) and Machine Learning:

Predictive Analytics: AI and machine learning algorithms are being developed to predict cardiovascular events, personalize treatment plans, and analyze large datasets to identify new therapeutic targets.

to predict cardiovascular events, personalize treatment plans, and analyze large datasets to identify new therapeutic targets.

Diagnostic Tools: AI-enhanced diagnostic tools, such as automated image analysis and risk prediction models, are improving the accuracy and efficiency of cardiovascular disease diagnosis and management.

Conclusion

The management of cardiovascular and thrombotic diseases remains a dynamic and rapidly advancing field, driven by a continuous stream of innovations in pharmacotherapy, interventional procedures, and emerging technologies. This review has highlighted the multifaceted approach required to effectively manage these complex conditions, encompassing lifestyle modifications, pharmacological interventions, interventional procedures, and the exploration of new therapeutic avenues.

Academic Toppers



National Science Day Celebration



Article 3:**Management Of Thrombotic & Cardiovascular Disorders**

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A man without discipline is a ship without a rudder. According to the Oxford English Dictionary, Disorder is a group of symptoms which disrupts your normal body functions but the cause of it is not known. These disorders take up a lot of time of an individual by disturbing the regular and or normal functions of everyday activities and day to day life. Disorder is therefore a flexible and individual term. This disorder may be persistent, remitting and relapsing, it is not unusual for the symptoms to wax and wane over time and somehow behave like a rollercoaster, with the severity increasing during times of stress, perhaps at work or during education.

Thrombotic disorder means hypercoagulability which refers to a state of heightened activation of the coagulation system responsible for pathogenesis of venous thromboembolism (VTE). The use of statins not only reduces arterial complications but also aid in prevention of VTE. Thrombotic disorders are increasing and the recognition that these patients have one or more associated genetic abnormalities i.e. thrombophilia while the remaining cases are usually labeled "spontaneous" or "idiopathic".

Although anti-thrombotic drugs have now been used for about more than 50 years, there is smaller range and variety of these agents than there are for other disorders. Heparin and the most famous oral anti-coagulant Aspirin and Warfarin entered clinical use in the late 1930s while Streptokinase (SK) came into existence since 1950s. There have been major advances in recent years in understanding the role of thrombosis as the people are more susceptible to it nowadays. Various reasons are coming up for deep venous thrombosis like long term hormonal therapy, pregnancy therapy, oral contraceptives, post-covid vaccine era etc. In allopathic system of medicines, the various drugs commonly used for treatment of thrombotic diseases Enoxaparin, Apixaban, Rivaroxaban, Dabigatran, Edoxaban. Out of these drugs, newly approved oral anti-coagulants are Apixaban, Rivaroxaban and Dabigatran.

Cardiovascular Diseases (CVDs) are contributing to around 25% of all deaths in a region. Around 17.9 million people died from CVDs in 2019, representing 32% of all global deaths. Out of these deaths. 85% were due to heart attack and

be managed with counselling and medicines. Therefore, treatment of CVDs like hypertension, diabetes and high blood lipids are necessary to reduce risk and prevent heart attacks and strokes among people with these underlying conditions. Other determinants for CVDs are poverty, stress and hereditary factors. Symptoms of heart attack or thrombosis include pain or discomfort in the centre of chest or pain in the arms, left shoulder, elbows, jaw or back. Commonly aspirin, beta-blockers, angiotensin-converting enzyme inhibitors and statins are preferred for treatment of cardiovascular diseases.

A good habit is a prime factor for a healthy lifestyle. One needs to inculcate good habits for maintaining a stable body. For overall fitness, diet is an important component which works best when combined with exercise. It is necessary to reduce weight if one is obese. For people who are overweight, more exercise and a strict regime are very necessary. The various ways by which one can prevent various lifestyle disorders are-

- Eating a balanced diet-Eating more fruits daily as they provide more vitamins and minerals to our bodies. Adding sprouts to at least one meal in a day. Eating salads and yogurt. Including fermented foods which contain useful bacteria that help in the process of digestion.
- Using less salt and sugar while cooking food.
- Manage stress
- Get regular health screening tests
- Get quality sleep
- Eating fish as it is rich in omega-3 fatty acids (salmon, tuna and trout)
- Using less oil while cooking especially avoiding deep-fried snacks or veggies.
- Excessive indulgence in habits such as smoking or alcohol should be avoided
- Consumption of Vitamin E

According to Dr. Todorov, "For good health and disease prevention, avoid ultra processed foods and eat homemade meals prepared with basic ingredients". As per a study conducted in 2019, it was concluded that consumption of more than 4 servings of ultra-processed food (chips, cookies, white bread, donuts) was associated with a 62% increased hazard for all the cause of mortality. These foods are responsible for causing chronic inflammation.

While healthy homemade food contains spices, lentils, nuts, seeds and healthy oils such as extra-virgin olive oil. The spices and herbs found in Indian kitchen like turmeric (contains curcumin, a powerful anti-inflammatory and anti-

oxidant), garlic (anti-platelet and anti-coagulant which slows cholesterol and prevents hypertension), ginger, coriander, cayenne pepper (contains capsaicin which prevents blood clots in arteries and blood), cinnamon (lowers blood pressure and reduces bad cholesterol), black pepper, scardamom, cumin and clove can prevent these heart diseases in a natural manner without any side-effects. Garlic contains allicin which is a potent blood thinner which is capable of cutting down risks like stroke. Getting regularly your Blood pressure, cholesterol, weight and blood sugar levels can help in managing thrombotic and cardiovascular diseases.

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Vishwakarma Jayanti



Article 4:

Management Of Thrombotic And Cardiovascular Disorders

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Heart attacks and strokes are acute events mainly caused by blockage which prevents blood from flowing to the heart or brain. Usually this occurs due to the deposition or circulation of fat on the inner walls of the blood vessels or in the blood stream respectively. Strokes can also result by bleeding from a blood vessel in the brain or from blood clots. Early atherosclerotic plaque progression is basically characterized by development of pathologic intimal thickening (PIT) with lipid pool that may convert to a necrotic core to lead to the formation of fibroatheroma. Another cause for coronary heart disease is the deposition of calcium. Many researchers have come up with medicines to treat deep vein thrombosis or cardiovascular diseases.

Keywords:

Thrombosis, Cardiovascular diseases, Atherosclerosis, plaque, stroke.

Introduction

Cardiovascular disease is a leading cause of death in Western world. Not only is heart disease a leading cause of death, but it's so expensive. According to the American Heart Association, by 2035 around 45% of the adults will be living with cardiovascular disease. Many researchers are still trying to find out the root cause of novel biomarkers in order to obtain detailed plaque morphology. Plaque are deposits which reduces the size of lumen of the artery and consequently the amount of blood flow. This reduced blood flow causes an inadequate nutrient and oxygen supply and water removal from the tissues, leading to a condition called as ischemia, which further leads to chest pain (angina pectoris). When the lumen narrows so much that a blood clot formation takes place, a heart attack can occur. According to WHO, Cardiovascular diseases (CVDs) are a group of disorders of the heart and blood vessels. They are:

- Coronary heart disease- disease of blood vessels supplying the heart muscle

- Peripheral arterial disease- disease of blood vessels supplying the arms and legs
- Rheumatic heart disease- damage caused to heart muscle and heart valves caused by streptococcal bacteria
- Congenital heart disease- malformations or birth defects of heart from birth
- Deep vein thrombosis and pulmonary embolism- blood clots in the legs veins which dislodge or move to heart and lungs.

Symptoms

A heart attack or a stroke may be sometimes the first sign of underlying disease. Symptoms of heart attack or CVDs may be-

- Pain or discomfort in the chest
- Pain or discomfort in the left elbow, shoulder, jaw
- Difficulty in breathing or shortness of breath
- Nausea or vomiting
- Light headedness or faintness
- Cold sweat
- Numbness of face, arm or leg
- Difficulty speaking or understanding speech
- Difficulty seeing with one or both the eyes

Tests based on symptoms are-

1. High sensitivity C-reactive protein (level of inflammation)
2. ECG (Electrocardiogram)
3. Exercise stress test (Treadmill test)
4. Echo cardiogram
5. Chest X-Ray
6. Coronary angiography or thallium stress test

Causes

There are various risk factors which are mainly responsible for thrombosis or Cardiovascular diseases. They are-

- Unhealthy diet (junk foods, foods rich in cholesterol like mutton, ham, sausages, chicken, egg yellow, whole milk, cheese, butter)
- Physical inactivity
- Use of tobacco
- Environmental pollution
- Raised blood glucose levels
- Raised blood lipids

- Overweight
- Raised blood pressure
- Excessive intake of salt and refined sugar
- Old age
- Overweight
- Raised blood pressure
- Excessive intake of salt and refined sugar
- Old age
- Smoking
- Alcohol
- No intake of fruits or omega -3 fatty acids
- Poor sleep pattern
- Stress
- Hereditary
- Comorbidities (patients with chronic kidney disease or Type 1 diabetes for over 10 years or rheumatoid arthritis)

Prevention and Treatment

There are two types of prevention i.e.-

- Primary prevention- to prevent CVD in patients without CVDs by determining the Q-Risk score. This test is performed to determine the percentage risk of stroke/myocardial infarction in next 10 years. If this score is more than 10%, doctors can prescribe statins for example Atorvastatin to such patients. For patients having comorbidities for over 10 years too can be recommended statins. Getting cholesterol level checked every three months should be practiced by such patients to monitor the decrease or increase in LDL or triglycerides. If there is an increase in lipid level, dose can be increased.

- Secondary prevention-to prevent CVDs again in patients who already have had heart attack, angina or stroke. Patients dealing with CVDs should have an access to appropriate technology and medication, for such patients 4 A's are recommended-

A-Aspirin

A-Atorvastatin

A-Atenolol (Beta blocker)

A-ACE inhibitor (e.g. Ramipril)

If these medicines don't work out properly then surgical operations are needed like-

- Coronary artery bypass
- Balloon angioplasty

- Heart transplantation
- Artificial heart operation
- Pacemakers
- Prosthetic valves
- Patches for closing holes in the heart

Side Effects of Statins

The medicines however help in regulation of lipid level in blood but these have possible side-effects too. The three major side-effects of statins are-

- Myopathy- When the statins affect the muscle fibre in the body, patient may complain about the pain/weakness in the muscle.
- Type 2 diabetes
- Haemorrhagic strokes

Herbal Remedies for Treatment and Management

- Garlic- It's a mighty defender as it has got anti-clotting properties due to the presence of allicin (a compound that prevents blood platelets from clumping together and forming clots)
- Turmeric- It's a golden healer due to the presence of curcumin content (anti-inflammatory and inhibits platelet aggregations)
- Ginger- It works by lowering the blood viscosity, making it more challenging for clots to form. Hence it reduces inflammation and improves blood circulation.
- Cayenne Pepper- It contains Capsaicin which helps in thinning of blood and reduces clot formation.
- Berries- Strawberries and blue berries are rich in flavonoids and anti-oxidants that improve the blood flow and prevents formation of blood clots.
- Omega-3 fatty acids- Foods like flax seed, salmon and walnuts are rich with good fats. They promote healthy cardiovascular system.
- Citrus fruits- Oranges and lemons are rich in vitamin C which fortifies blood vessel and reduces the clot formations
- Dark chocolate- It contains flavonoids that enhances blood flow.

As it can be seen that a heart healthy lifestyle requires everyone to pay attention to a few lifestyle factors- eating healthy food, getting regular physical exercise, maintaining healthy weight, drinking alcohol in moderation, quit smoking, managing stress and getting enough sleep. Therefore, these easy to implement changes in lifestyle can reduce risk of blood pressure, high cholesterol and diabetes which in turn can reduce the risks of heart disease.

Herbal Exhibition



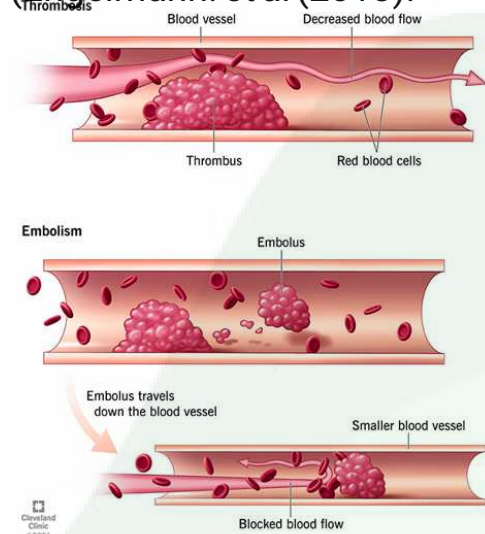
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Article 5:**Management of cardiovascular and thrombotic disorders****Author Name: Neha Shukla, Associate professor,****Affiliation: Sagar Institute of Pharmaceutical Technology and research,
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The development of a blood clot (thrombus) inside a blood vessel or a heart chamber is known as thrombosis. Clots have the potential to rupture and spread to other parts of your body or to stop blood flow in your blood vessels. Blood flow to vital organs like the brain or lungs can be disrupted by a clot that becomes lodged there, potentially leading to a life-threatening situation. The position of the clot affects the symptoms, which can include skin changes, breathing difficulties, and chest pain.

Thrombosis and inflammation are separate physiological processes yet an intense interdependence between these mechanisms has been recognized over the past decade. Physiologically, inflammation-dependent activation of the coagulation system is part of the host response to pathogens, aiming to limit their systemic spread in the bloodstream. This response is achieved through an interplay between innate immune cells and platelets, triggering the activation of the coagulation system in a process termed immunothrombosis.

(Engelmann. et al (2013).



There are two primary forms of thrombosis: thrombosis in the vessels. This is the development of a blood clot in an artery. Blood is transported throughout your body via your arteries from your heart. The most frequent cause of heart attacks and strokes is arterial thrombosis.

thrombosis of the veins. This is the occurrence of a blood clot in a vein. Your veins return blood from your body to your heart. The most frequent cause of a pulmonary embolism (blood clot in the lung) is venous thrombosis. Whether it occurs in an artery or vein, thrombosis is hazardous because it can:

Create an obstruction where it arises. The clot could remain stationary and enlarge until it obstructs blood flow. The location and size of the clot determine how severe the obstruction is.

Make a blockade in another location. An embolus could develop from the clot if it breaks off from its source. After then, it may pass through your circulation and lodge itself in a smaller blood artery, obstructing it (embolism). This is typically the source of illnesses like pulmonary embolism and stroke.

Inflammatory mediators of Thrombosis:

Anker and Von Haehling (2004) revealed that a number of inflammatory mediators, including immunological antigens, interleukin 6 (il-6), tumour necrosis factor ? (tnf-?), il-1?, il-18, and others, are higher in the plasma of hf patients. these put out the "cytokine hypothesis," which maintains that inflammation plays a part in the pathophysiology of heart failure (seta et al., 1996; mann, 2015). the increased levels of circulating cytokines may be caused by a variety of cardiac infiltrating immune cells (pinto et al., 2016), extracardiac tissues (hypoperfused skeletal muscle, lymphoid organs, intestinal tissue, and adipose tissue), and cardiac structural cells (cardiomyocytes; kapadia et al., 1995; endothelial cells; liu y. et al., 2014; and fibroblasts; sandanger et al., 2013).

The size, location (where the clot forms or becomes stuck), and complications that the clot causes all affect the symptoms of thrombosis. Blockages are more prone to happen in regions of the body with tiny blood vessels, such as the brain, lungs, and lower extremities. The typical symptoms for each area are listed below: pulmonary embolism in the lungs Sharp discomfort in your arm, back, neck, shoulder, and chest, as well as nearby. a sore feeling upon inhaling. sudden difficulty breathing, either while moving or not. Transient ischaemic attack (TIA) or stroke in the brain or neck muscle weakness or difficulty controlling one side of the body. speech slurred or distorted. noticeable sagging and uncontrollably tense muscles on one side of your face.

Heart (a heart attack) discomfort or pain in the chest (angina). Trouble breathing. Lightheadedness or fainting. Individuals designated as female at birth frequently experience extra symptoms. Mesentery ischaemia in the belly severe pain in the abdomen or stomach, particularly after eating. nausea, vomiting, and bloating.

Diarrhoea, possibly with blood in it. High temperature. An arm or leg artery

paler-looking skin than in other places. skin that has a chilly texture. a weakened and immobile afflicted body component. tingling or numbness (pins and needles), maybe accompanied by discomfort. sores, cuts, or blisters. Sloughing of the skin refers to the separation of the skin from the underlying tissue. death of tissue, called necrosis.

Thrombosis can be diagnosed by physical examination, evaluation of blood parameters, and confirmation through imaging tests. components of blood. Numerous assays quantify specific blood components, such as platelets, and chemical substances, particularly those that have an impact on coagulation.

Indicators of clot development. These are substances that usually only become visible in your blood when a clot is present. They can assist medical professionals in ruling out or verifying an active clot.

Indicators of heart injury. Troponin, a protein found in muscle cells, is one instance of this. There is a particularly particular kind of troponin that is only found in the heart muscle cells. When your heart cells are damaged, as happens after a heart attack, troponin seeps into your circulation. Tests for troponin can be used to confirm or rule out heart attacks, which are frequently caused by thrombosis. A blood clot in your lungs can also result in an elevated troponin due to increase strain on the heart because it pumps blood through the lungs.

Current and Novel Antiplatelet Therapies for the management of Cardiovascular Diseases:(Jourdi et al; Int J Mol Sci. 2021)

Molecule	Drug Target	Route of Administration	Elimination Half-Life	Onset of Action after Loading Dose	Time to Platelet Fun. Recovery after Drug Discontinuation	Common Clinical Indication
Aspirin	Cyclo-oxygenase-1	oral	15–20 min	~20 min ¶	5–7 days	ACS, CAD, PAD, stroke, TIA
Clopidogrel	P2Y ₁₂	oral	30 min #	2–6 h	7 days	ACS, CAD, stroke, TIA
Prasugrel	P2Y ₁₂	oral	30–60 min #	30 min	7–10 days	ACS
Ticagrelor	P2Y ₁₂	oral	7–9 h	30 min	3-5 days	ACS
Cangrelor	P2Y ₁₂	oral	IV		30–60 min	ACS

Vorapaxar	PAR1	oral	5–13 days	-	4–8 weeks	PAD
Dipyrida mole	PDE3/5	oral	10 h	-	-	Stroke, TIA
Cilostazol	PDE3A	oral	11–13 h	-	12–16 h	PAD
Iloprost	PGI ₂ analogue	IV	30 min	-	-	PAD
Eptifiba-tide	GPIIb/IIIa	IV	2.5 h		4-8 h	ACS
Tirofiban	GPIIb/IIIa	IV	2 h	20-40 min	4-8 days	ACS

Conclusion:

Blood pressure drugs. The inside of your blood vessels are subjected to excessive strain over time by high blood pressure. Blood clots may form and spread more easily on your vessel walls as a result of this type of wear and strain. Blood pressure drugs work by preventing clots from forming in the first place. drugs that thin the blood. These drugs stop blood clots from occurring too quickly. Different types are used by providers to treat and prevent thrombosis. Drugs that reduce cholesterol. Your blood pressure affects the amount of plaque that accumulates in your arteries, and plaque increases the risk of thrombosis. Reducing your cholesterol prevents this accumulation. Restoring your blood flow and reducing your risk of problems are possible with early diagnosis and treatment. Your healthcare professional will treat any complications that led to your diagnosis, such as a heart attack or stroke, and will make every effort to restore function to the afflicted organs and tissues.

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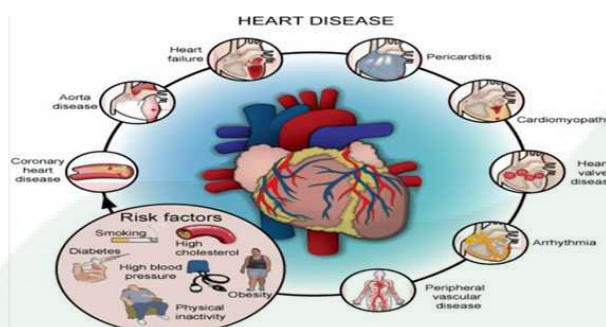


Poster Presentation:



Article 6:**Management of Cardiovascular Disease: A Comprehensive Approach****Author Name: Ms Mahima Patwardhan, Associate Professor****Affiliation: SIPTec, Gandhi Nagar**
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Cardiovascular disease is a complex group of conditions that can significantly impact health and quality of life. Cardiovascular disease (CVD) encompasses a range of conditions affecting the heart and blood vessels. It remains a leading cause of death globally; with significant impacts on public health. The World Health Organization (WHO) regularly publishes reports and updates on the global impact of cardiovascular disease (CVD), which remains a major public health challenge. By understanding its types, risk factors, symptoms, and strategies for prevention and management, individuals and healthcare providers can work together to reduce the burden of CVD and improve outcomes for those affected. In this article we will discuss about the various forms of cardiovascular disease, their risk factors, and their management.

**Types of Cardiovascular Disease**

1. Coronary Artery Disease (CAD): This is caused by the build-up of plaque in the coronary arteries, which supply blood to the heart muscle. Plaque is composed of fat, cholesterol, and other substances. CAD can lead to angina (chest pain) and heart attacks.

2. Arrhythmias: These are irregularities in the heart's rhythm. Common arrhythmias include atrial fibrillation (Afib), which can increase the risk of stroke, and ventricular tachycardia, which can be life-threatening.

3. Heart Failure: Often referred to as congestive heart failure (CHF), this condition occurs when the heart is unable to pump blood effectively to meet the body's needs. It can result from various conditions, including CAD, high blood pressure, and heart valve disorders

4. Stroke: Caused by a disruption in the blood supply to the brain, stroke can be ischemic (due to a blockage) or haemorrhage (due to bleeding). It can lead to severe neurological impairment or death.

5. Aortic Aneurysm: An aortic aneurysm is a bulge in the wall of the aorta, the large artery carrying blood from the heart to the rest of the body. If it ruptures, it can cause life-threatening bleeding

6. Valvular Heart Disease: This involves damage to one or more of the heart valves, affecting their ability to regulate blood flow. Conditions include aortic stenosis, mitral regurgitation, and mitral stenosis.

7. Peripheral Artery Disease (PAD): PAD affects the blood vessels outside the heart and brain, usually in the legs. It occurs due to the narrowing of the arteries, leading to reduced blood flow and symptoms such as pain or cramping in the legs during physical activity.

These are the major types of cardiovascular conditions that can significantly impact health and quality of life. There are some risk factors which may lead to the above conditions; the risk factors are enlisted below:

Modifiable Risk Factors: Key modifiable risk factors include tobacco use, unhealthy diet, physical inactivity, excessive alcohol consumption, and obesity. High blood pressure, high cholesterol, and diabetes are also critical risk factors.

Non-Modifiable Risk Factors: Age, genetic predisposition, and gender play significant roles. The prevalence of CVD tends to increase with age, and there are differences in risk profiles and outcomes between men and women.

play significant roles. The prevalence of CVD tends to increase with age, and there are differences in risk profiles and outcomes between men and women.

Prevention and Management strategies for cardiovascular diseases:

Cardiovascular disease (CVD) remains a leading cause of morbidity and mortality worldwide. Effective management of CVD requires a multifaceted approach that includes lifestyle modifications, pharmacological treatment,

and sometimes surgical interventions. Here's a comprehensive look at the strategies used in managing cardiovascular disease.

1. Lifestyle Modifications

Diet: A heart-healthy diet is crucial in managing cardiovascular disease. The Dietary Approaches to Stop Hypertension (DASH) diet and the Mediterranean diet are often recommended. These diets emphasize fruits, vegetables, whole grains, lean proteins, and healthy fats while limiting saturated fats, cholesterol, and sodium.

Exercise: Regular physical activity is essential for cardiovascular health. The American Heart Association recommends at least 150 minutes of moderate-intensity aerobic exercise or 75 minutes of vigorous-intensity exercise per week, along with muscle-strengthening activities.

Smoking Cessation: Smoking is a major risk factor for cardiovascular disease. Quitting smoking can significantly reduce the risk of heart attack and stroke. Support may include counselling, nicotine replacement therapy, and medications.

Weight Management: Obesity is associated with various cardiovascular

Pharmacological Treatment

Antihypertensive: Managing high blood pressure is critical. Medications includediuretics,ACE inhibitors,angiotensinIIreceptorblockers(ARBs), beta-blockers, and calcium channel blockers.

Statins: These drugs help lower LDL cholesterol levels and reduce therisk of heart attacks and strokes. They are commonly prescribed for patients with high cholesterol or a history of cardiovascular events.

Antiplatelet Agents: Aspirin and other antiplatelet drugs help prevent blood clots, reducing the risk of heart attacks and strokes. The use of antiplatelet therapy depends on individual risk factors and the presence of conditions like coronary artery disease.

Anticoagulants: For patients with conditions like atrial fibrillation, anticoagulants (e.g., warfarin, direct oral anticoagulants) help prevent blood clots and reduce stroke risk.

Heart Failure Medications: For patients with heart failure, medications such as

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Surgical and Interventional Procedures

Coronary Artery Bypass Grafting (CABG): This surgery is performed to improve blood flow to the heart by bypassing blocked coronary arteries with grafts taken from other parts of the body.

Percutaneous Coronary Intervention (PCI): Also known as angioplasty, PCI involves the insertion of a balloon catheter to open up blocked coronary arteries, often accompanied by the placement of a stent to keep the artery open.

Valve Repair or Replacement: For patients with significant heart valve disease, surgical repair or replacement of the affected valve(s) may be necessary.

Implantable Devices: Devices such as pacemakers and implantable cardioverter-defibrillators (ICDs) help manage arrhythmias and improve heart function in certain conditions.

4. Monitoring and Follow-Up

Regular Check-Ups: On-going monitoring of blood pressure, cholesterol levels, and overall cardiovascular health is essential. Regular visits to healthcare providers help adjust treatments and manage risk factors effectively.

Patient Education: Educating patients about their condition, treatment options, and lifestyle changes is crucial for effective disease management. Empowering patients with knowledge helps them make informed decisions and adhere to treatment plans.

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Psychosocial Support: Managing cardiovascular disease can be stressful and may affect mental health. Psychological support, counselling, and stress management techniques can be beneficial and may affect mental health. Psychological support, counselling, and stress management techniques can be beneficial.

FDA approved Drug(2023-2024) for the management of cardiovascular disease:

- **INPEFATM** (sotagliflozin) tablets, for oral use Initial U.S. Approval: 2023 - INPEFA is indicated to reduce the risk of cardiovascular death.
- **TRYVIOTM** (aprocitentan) tablets, for oral use Approval: 2024 - TRYVIO is an endothelin receptor antagonist indicated for the treatment of hypertension in combination with other antihypertensive drugs, to lower blood pressure
- **Winrevair** (sotatercept) is an activin signaling inhibitor used for the treatment of adults with pulmonary arterial hypertension.

Diagnosing cardiovascular disease typically involves a combination of patient history, physical examination, and various diagnostic tests. Here's a general outline of the process:

1. Medical History: The healthcare provider will ask about symptoms (e.g., chest pain, shortness of breath), personal and family medical history, risk factors (e.g., smoking, diabetes, hypertension), and lifestyle factors.

2. Physical Examination: The doctor will perform a physical exam, checking vital signs, listening to the heart and lungs, and examining the extremities for signs of circulation problems.

3. Diagnostic Tests: Blood Tests: To check for markers of heart disease like cholesterol levels, blood sugar levels, and other indicators.

Electrocardiogram (ECG or EKG): Measures the electrical activity of the heart and can detect irregularities.

About Sagar Group, SIPTec and SIPTec-R

Sagar group came into existence in the year 1983 under the visionary leadership of Chairman Shri Sudhir Kumar Agrawal. Over the years, it has now transformed into one of the largest corporate house and business conglomerate of Central India. In its journey of over three decades, the group has successfully ventured in the field of education, real estate, production and manufacturing to employ 5000+ people and impact lives of more than two lakh people every day. **Sagar Group** has been felicitated with IBC24 Excellence Award 2017 for its contribution to Madhya Pradesh's Industrial Development and Incredible Societal Development. **Agrawal Builders** have established its presence as one of the leading Real Estate giants with over 40 years of rich experience in building state-of-art residential projects. **Sagar Manufacturers Pvt Ltd** has pledged to use the best fibers to produce superior quality yarns with the world-class production technology. In a short span of time the company has achieved an installed capacity of 2,00,000 spindles and exporting its products to over 20+ countries. **Sagar Nutriments Pvt Ltd** is **Sagar Group's** recent venture in food processing premium quality basmati rice.

Sagar Group has earned a lot of praise across the nation empowering youth of Madhya Pradesh with a bright career and life. The group provides world class school and technical education under **Sagar Group of Institutions** to 20000+ students with 2000+ dedicated faculties. The group imparts schooling through the chain of **Sagar Public Schools** (SPS) to nurture the young mind. Today, SPS is considered as the most preferred brand for holistic education and Indian Value System to its core featuring amongst the **Top 100 schools in India** with its campuses at **Saket Nagar, Gandhi Nagar, Rohit Nagar, Ratibad, Katara Extension** and **Dwarka Dham**. **Sagar Institutes** (SISTec) are engaged in providing the best technical education in the field of engineering, pharmacy, and management.

Sagar Group has also ventured into healthcare sector. **Sagar Multispecialty Hospital** - the best Multispecialty Hospital in Bhopal - where we cure with expertise and compassion. The patients deserve personalized care & your holistic well-being, that is the heart of everything The Sagar Group do. The multispecialty team has the best doctors & dedicated healthcare experts, committed to delivering expert treatment. The Sagar Group constantly invests in the latest medical advancements and technologies to provide the patients

invests in the latest medical advancements and technologies to provide the patients with the highest quality of care. Our state-of-the-art facilities and equipment ensure accurate diagnoses and effective treatments, giving you peace of mind knowing that you're receiving the best possible care.

Sagar Institute of Pharmacy and Technology (SIPTec) is the premier institution known for its high standards in teaching and research in pharmaceutical sciences. SIPTec was established in 2008. The Institute is also registered under CCSEA. Today, within a short span of 15 years, the institute has gained a reputation of being one of the **top Pharmacy Colleges in MP** that provides total pharmaceutical education comprising B.Pharm. and M.Pharm. (Pharmaceutics&Pharmaceutical Chemistry).

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22nd NOVEMBER 2024