Deep Vein Thrombosis

Oxygenated blood originating from the lungs is directed to the left side of the heart. From there, it travels through the aorta and its branch arteries, distributing vital oxygen and nutrients to various organs throughout the body. This blood then collects carbon dioxide and other waste products from the organs and enters the network of blood vessels known as veins. Veins facilitate the return of blood back to the right side of the heart. Once there, the blood is re-routed to the lungs, where it releases carbon dioxide and absorbs fresh oxygen before beginning the cycle anew. It's important to note that blood flow in veins is notably slower compared to arteries. In certain instances, blood can clot within the veins, a condition referred to as Deep Vein Thrombosis (DVT).

While DVT commonly occurs in the veins of the legs, it is essential to recognize that blood clots can also develop in other areas, including the abdomen, brain, and neck. When a blood clot travels through the bloodstream and reaches the right side of the heart, there is a risk of it becoming trapped in the pulmonary blood vessels, leading to a condition called Pulmonary Embolism. Should a large blood clot obstruct the pulmonary veins, it can result in a life-threatening situation, with the patient experiencing severe consequences within minutes due to compromised blood circulation in the lungs.

Surprisingly, approximately 150 out of every one lakh people suffer from DVT. The number of deaths caused by Pulmonary Embolism surpasses those resulting from road accidents, breast cancer, and HIV combined. However, despite its severity, there is a notable lack of awareness among the general public about this disease.

Maintaining constant flow of blood within blood vessels is crucial to prevent clotting. When blood movement slows down or stops, the risk of clot formation increases. The heart's powerful pumping action propels blood rapidly through the arteries, maintaining fast blood flow in those vessels. However, unlike the heart, there is no similar organ in the body to pump blood through the veins. Instead, blood flow in the veins heavily relies on external factors, such as muscle movement. When we use the muscles in our legs, like during walking or physical activity, pressure is exerted on the veins in the legs, helping to propel blood towards the heart. To ensure efficient blood circulation, one-way valves are present in the veins of the legs. These valves prevent blood from flowing backward due to the force of gravity, allowing blood to move in a single direction, towards the heart.

Several situations can lead to slowed blood flow in the veins, potentially leading to blood clot formation. For instance, during prolonged periods of immobility, such as long-distance travel or extended bed rest following major surgery or accidents, blood flow in the veins may decrease. In the case of patients in the Intensive Care Unit (ICU) who are unable to

move their legs for extended periods, blood flow can come to a halt, further increasing the risk of clot formation. Additionally, external factors like intra-abdominal tumors can compress veins and obstruct blood flow.

Polycythemia, a condition characterized by an excess of red blood cells in the blood, can also contribute to clot formation. The increased density of the blood and its thicker consistency due to the higher number of red blood cells can slow down blood movement, potentially leading to clotting.

In certain individuals, their blood exhibits an increased tendency to clot, which can be attributed to various factors such as an excess of clotting factors, deficiencies in factors that inhibit clotting, or deficiencies in factors responsible for breaking down clots. These conditions are referred to as Hypercoagulability or Thrombophilia and may either be hereditary or acquired over time after birth. Some genetic disorders that can lead to blood clots in the veins include Antithrombin deficiency, Protein C deficiency, Protein S deficiency, Factor V Leiden, Prothrombin gene mutation, and Dysfibrinogenemia.

However, even in the absence of genetic issues, certain factors can elevate the risk of blood clots, such as pregnancy and the postnatal period, contraceptive pill usage, nephrotic syndrome, obesity, Antiphospholipid Syndrome (APLA), internal cancer diseases, and Paroxysmal Nocturnal Hemoglobinuria (PNH).

When blood clots form in the veins of the leg, it obstructs normal blood circulation, resulting in pain and swelling in the affected leg. The presence of blood clots can be detected using a diagnostic test called Venous Doppler. Following treatment, the clot undergoes recanalization, where new tunnels form inside the clotted blood, allowing blood circulation to resume. Unfortunately, these newly formed tunnels lack valves, which are essential for maintaining proper blood flow towards the heart. As a result, blood may flow back towards the legs due to gravity, causing various symptoms like leg pain, swelling, heaviness, itching, thickening and darkening of the skin, and, in severe cases, even skin ulcers despite adequate treatment. This condition is known as Post-Thrombotic Syndrome and affects approximately 1 in 4 individuals who have experienced blood clots in their veins.

Pulmonary Embolism (PE) can lead to varying complications based on the size of the clot. Some individuals may not experience significant issues, while others may present with symptoms like cough, blood in sputum, and chest pain. In more severe cases where the clot is large, individuals may encounter severe breathing difficulties, a drop in blood pressure leading to shock, blackouts, chest pain, coma, and even death in a short span. In such critical situations, immediate admission to the Intensive Care Unit (ICU) and treatment to dissolve the clot are essential.

If the complications are not severe, treatment typically begins with injections of Heparin or Enoxaparin to enhance the dissolution of clot. Warfarin or Acitrom, along with these injections, are also prescribed. In some cases, newer clot-dissolving medications such as Rivaroxaban, Apixaban, or Dabigatran may be used. Additionally, patients are advised

to wear compression stockings during treatment to promote proper blood circulation.

The duration of treatment depends on the underlying cause of the clot formation. If the cause can be addressed and eliminated, the medication may only be required for three to six months. However, if the cause persists or remains unknown, individuals may need to take anticoagulant pills for the rest of their lives. In certain situations with a high risk of bleeding, lifelong medication may be discontinued after six months.

For deep vein thrombosis involving blood vessels in abdomen, brain, and other areas, same treatment is given.

For individuals on Warfarin or Acitrom, regular blood tests, such as PT/INR tests, are necessary to determine the thickness of the blood. The target INR is generally set at two to three. If the blood is too thin (high INR), the risk of spontaneous bleeding increases, and the dose of anticoagulant drugs may need to be reduced. On the other hand, if the blood is less thin (low or normal INR), the risk of clotting rises, and the drug dose may need to be increased.

If the patient experiences any bleeding, dark stools, or severe headaches while taking these medications, they should go to the emergency department immediately and inform their doctor about the medications they are taking. The patient should avoid situations where they may get injured, especially head injuries. In case of any injury, they should promptly go to the emergency department and get evaluated.

Vitamin K can reduce the effectiveness of anticoagulant medications like Warfarin and Acitrom. Foods high in vitamin K, such as green leafy vegetables (cabbage, mint, spinach, dill, etc.), should not be consumed along with these medicines. Additionally, some other drugs may either increase or decrease the efficacy of anticoagulants, so it is essential for the patient to consult a doctor before starting any new medication. They should use only "Paracetamol" as a painkiller and avoid other medications.

Alcohol consumption increases the risk of bleeding, so the patient should refrain from drinking alcohol while taking these medications.

Anticoagulants should be taken at a specific time every day, preferably six to eight in the evening on an empty stomach.

These medications can have adverse effects on a developing fetus, so the patient should take precautions to avoid pregnancy while on these medicines. If the patient is undergoing any surgical or dental procedures, it is advisable to consult a hematologist before proceeding. They should not discontinue these medications without their doctor's prescription or recommendation.

While this article provides significant information about deep vein thrombosis, any additional questions or concerns can be addressed by the patient's treating doctor. Regular communication and follow-up with the medical team are essential for the patient's proper management of the condition.

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