

Anticoagulation Therapy Newsletter

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To Your Health -- CHRC Newsletter

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Normal Blood Clotting

After a blood vessel is cut, a three-step process is required to change a liquid substance (blood) into a gel (clot) to prevent its escape from the blood vessel. First, there is a contraction of the cut blood vessel to limit the amount of blood escaping from the cut. Secondly, a plug is formed with platelets (part of the blood), to block the leak even more. Finally, clotting factors in the blood become active and change the liquid blood into a gel (clot).

When the injured area is healed and the clot is no longer needed, the body gradually reabsorbs the clot. But what if something goes wrong with this process?

When Things Go Wrong

As long ago as the 1800s, German pathologist Rudolf Virchow observed that a harmful clot in the blood is formed from the interaction of reduced blood flow, blood vessel injury and/or a change in the blood itself making it easier for a harmful clot to form.

Reduced blood flow: We know that if blood flow through the blood vessels is slow (e.g. if an individual is in bed for a long time) harmful blood clots can form.

Blood vessel injury: Injury to blood vessels can occur during surgery or because of an injury to the body from an accident. It is believed that injury to the blood vessels releases too much of the blood clotting factors. The body becomes overwhelmed and cannot clear the clotting factors from the injury site, causing a harmful clot to form.

Change in the blood: Any deficiency or abnormality of clotting factors can interfere with the body's normal clotting mechanism.

Anticoagulant Medication

An anticoagulant is a drug that interferes with the normal clotting of blood. It is sometimes called a "blood thinner". This is not really a correct term since the blood does not become thinner; it simply takes longer to clot. These drugs do not break up the clot; but stop it from getting bigger or new clots from forming. They do this by reducing the amount of clotting factors. There are two types of anticoagulants: one is heparin which is given by injection, usually at the beginning of treatment in the hospital; and the other is an oral anti-coagulant, taken by mouth. The focus of this article is on oral anticoagulant therapy.

Warfarin, (named from the initials of Wisconsin Alumni Research Foundation, which held the original patent on warfarin), is the most frequently prescribed oral anticoagulant. There is some risk involved in taking this medication because of its effects on clotting. When warfarin is taken properly, the risk is relatively small compared to the benefits. Warfarin does not cause bleeding; it only makes it harder to stop if it occurs. Duration of therapy varies with individual cases.

Who Needs Anticoagulation Therapy?

The four most common conditions for which anticoagulant therapy is prescribed are atrial fibrillation, deep vein thrombosis, pulmonary embolism, and mechanical heart valves.

Atrial fibrillation is a common heart disorder. More than 2 million Americans over the age of 65 have atrial fibrillation. It is usually associated with underlying heart disease or occasionally with thyroid disorders. But it can occur in otherwise healthy individuals. In this condition, the top two chambers of the heart, the atria, beat irregularly and rapidly. They may contract as much as 350-400 times a minute, compared with the normal 60 to 100 times. Because of these rapid, irregular beats, blood does not completely empty out of the atrium during a contraction. This can cause pooling of the blood and the formation of a blood clot in the atrium. Atrial fibrillation can lead to a stroke.

If a clot in the atrium breaks free, it can lodge in an artery of the brain and cut off the blood supply to that area. Approximately 80,000 strokes occur a year because of atrial fibrillation.

Deep vein thrombosis is a condition in which blood clots form in the deep blood vessels of the legs and groin. These blood clots can block the flow of blood from the legs back to the heart. Deep vein thrombosis occurs in about 2 million people a year. People who have major surgery on their legs, hips, or knees, people who have cancer and people who have been previously diagnosed with deep vein thrombosis are at increased risk.

Pulmonary embolism is a condition in which the bloodstream carries a piece of a blood clot from another location to a vessel in the lungs. Approximately 600,000 people a year experience a pulmonary embolism and about 60,000 of these cases are fatal.

Mechanical heart valve replacement: Sometimes a person has a heart valve that is damaged and needs to be replaced. If it is replaced with a mechanical valve made of man-made substances, the body recognizes it as a foreign object and attempts to protect the body against it. Blood clots may form as a result. These blood clots can travel to other parts of the body and cause serious problems, such as strokes.

Medication Management

Warfarin should be taken around the same time every day. If a dose is missed and there are more than 12 hours before the next dose, the missed dose should be taken. The dose should not be doubled to make up for the missed one. Some form of identification, a wallet card or a medical alert bracelet/pendant, indicating that warfarin is being taken, should be carried in case of an accident.

Blood tests: Periodic blood tests are needed to make sure that the proper effect of warfarin is achieved. In the beginning, the blood may be tested frequently to best determine the ideal medication dose. After that, monthly testing may be done. The prothrombin time is a test of the speed of clotting. The goal of therapy is to slow clotting by a desired amount, as measured by the International Normalized Ratio (INR) based on the prothrombin time. The goal is usually an INR of 2.0–3.0, but may vary depending on the specific case. It is very important to keep all medical appointments for monitoring warfarin therapy. Failure to keep medical appointments could result in the INR being too high or too low, increasing the risk of bleeding or formation of blood clots.

Diet: Vitamin K, a nutrient found in food, can decrease the effects of warfarin. The warfarin dose is based on your usual daily diet. It is important to eat the same amount of vitamin K foods and avoid large changes in the vitamin K content of the diet. Foods high in vitamin K are the dark green, leafy vegetables such as broccoli, spinach, cabbage, mustard greens. All these foods are healthy and good. The diet should be kept consistent. Look at labels especially of supplements or diet aids. Vitamin K is sometimes added to them. Alcohol can either increase or decrease the effect of warfarin. It is not always predictable. If the person taking warfarin must drink, it is best to limit consumption to no more than 1–2 alcoholic drinks a day.

Drug Interactions: Many drugs increase or decrease the anticoagulant effect of warfarin, resulting in bleeding or clots. The health care provider should be told of all prescription and non-prescription medications and herbal products being taken. While on warfarin, it is important not to start or discontinue any new non-prescription drugs or herbal products without telling the health care provider. It is also important to let all health care providers know that warfarin is being taken so that the provider can avoid prescribing medications that interfere with its effect. If a medication that interacts with is prescribed, the INR should be checked sooner or as advised by the health care provider. Aspirin should not be taken while taking warfarin. Acetaminophen may be used for pain in moderate doses, but no more than nine pills a week. If more than nine pills a week are needed, the health care provider should be called for advice.

Side Effects: While taking warfarin, it is important to watch for signs of bleeding. Bleeding gums, easy bruising, and longer periods of bleeding after minor cuts, prolonged menstrual bleeding and occasional nosebleeds are considered minor bleeding. Most of the time this is not serious. The health care provider should be called if there is a question about the significance of the amount of bleeding. Coughing up blood, vomiting blood, blood in urine or bowel movements or large unexplained bruises are signs of major bleeding. The health care provider should be notified promptly. Fever over 101° F, flu, viral/bacterial infection, nausea, or vomiting (for more than 24 hours) and diarrhea can cause warfarin to accumulate in the body and the INR to go up dramatically. The health care provider should be notified if any of these situations occur.

Physical Activities: There is no reason to stop normal physical activities such as walking, swimming or gardening. Body contact sports such as football, hockey or other activities in which injuries are more likely to occur should be avoided.

What is in the future of anticoagulation therapy? A new oral anticoagulant, ximelagatran, is in clinical trials. It seems to have few drug interactions and does not need to be monitored by a blood test.

In summary, warfarin is a complex medicine that is helpful for many people.

Remember:

- Let all health care providers know that warfarin is being taken.
- The INR should be tested regularly as scheduled.
- Food, alcohol, illness, and other medications impact anticoagulant effects of warfarin.
- Call the health care provider if there are any questions.

An anticoagulation clinic is a new way to test and monitor patients on warfarin. The clinic's purpose is to determine the correct dose of warfarin, based on the INR, provide patient education and follow-up and coordinate care with other providers involved in care. Palo Alto Medical Foundation has anticoagulation clinics in Palo Alto and in Fremont. A referral by the primary care provider is required.

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