

I NEED TO KNOW ABOUT CRYO-DEPLETED PLASMA AND TTP

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What is Cryo-depleted plasma?

Cryo-depleted plasma and its related product cryoprecipitate is made from Fresh Frozen Plasma (FFP). Cryo-depleted plasma is the component that remains once Cryoprecipitate has been removed from FFP. (See the fact sheets *I Need to Know About Fresh Frozen Plasma*, Vol 1, No 3 and *I Need to Know About Cryoprecipitate*, Vol 2, No 2.)

How do we make Cryo-depleted plasma?

FFP is thawed to 1–6°C. At this temperature sediment forms that can be collected and refrozen. This sediment is Cryoprecipitate. The part of the FFP remaining is plasma without cryoprecipitate and is called Cryo-depleted plasma. Cryoprecipitate contains a few clotting factors: Factor VIII; fibrinogen; von Willebrand Factor and Factor XIII. All of the other clotting factors remain in the Cryo-depleted plasma. It can be stored frozen for 12 months.

What is Cryo-depleted plasma used for?

The main use of Cryo-depleted plasma is for the treatment of Thrombotic Thrombocytopenic Purpura (TTP). If TTP is not treated it is often fatal. It can be used as a substitute for FFP in some conditions.

What is TTP?

Fortunately TTP is uncommon. Patients have clots that form in some blood vessels, particularly in the brain (which can lead to stroke) and in the kidneys. Another term for 'clot' is 'thrombosis' and these clots indicate a 'thrombotic' tendency. TTP patients have low platelet counts or 'thrombocytopenia'. Even though the patients have clots, there is also bleeding, mostly into the skin. These bruises in the skin are called 'purpura', hence the term Thrombotic Thrombocytopenic Purpura.

Why does TTP happen?

The most common cause is an antibody which attacks a protein in our blood called ADAMTS13. We do not know why some people make these antibodies.

How does TTP happen?

ADAMTS13 acts like a pair of scissors to keep another protein, von Willebrand factor (vWF), the right length. vWF



is produced as a very long strand and can cause platelets to stick together. Too much of this long vWF can lead to too many platelets sticking together, making clots which lodge in small blood vessels in the brain and kidney. ADAMTS13 acts to trim the length of vWF, preventing platelet clots. If there is no ADAMTS13, then clots can happen.

How does Cryo-depleted plasma help TTP?

The usual treatment for TTP is plasma exchange where an apheresis machine removes the patient's plasma and replaces it with Cryo-depleted plasma. This may have to happen daily for a number of days. The plasma exchange allows for the removal of the antibodies that are destroying ADAMTS 13 and provides a source of ADAMTS 13. Thus, plasma exchange with Cryo-depleted plasma works in two ways to treat the patient.

BLOOD FACT

In extreme cases, plasma from more than 1,000 whole blood donations can be required to treat a patient with TTP over the course of their disease.