Heat-Treated Plasma as a Thereaputic Agent for Thrombotic Microangiopathies

Published date: Oct. 25, 2012

Technology description

Challenge

Thrombotic microangiopathies – clotting in capillaries and arterioles that results from endothelial injury - are associated with hemolytic anemia and organ ischemia, most commonly resulting in renal failure and damage to the central nervous system. The condition is currently managed by inhibiting thrombosis, through mouse/human chimera complement blockers or by applying a solvent/detergent treatment to the patient’ s blood plasma.

Solution

The present invention is a new concept for treating cases of thrombotic thrombocytopenia purpura and hemolytic-uremic syndrome associated with thrombotic microangiopathies. Fresh frozen plasma (FFP) is heated to inactivate both classical and alternative pathways. Heat-inactivated complement factor B inhibits the alternative complement pathway, preventing excessive activation of this pathway and thereby reducing resultant thrombosis.
Market Potential
Heat-inactivated plasma without functional CFB can be used as an infusion therapy for patients with clinical characteristics of thrombotic microangiopathies (TMA), or clotting in capillaries and arterioles due to epithelial injury. This treatment applies specifically to TMA attributable to excessive AP activation due to loss of complement regulation from either mutations or autoantibodies.
The heated FFP may also have potential as an infusion therapy for age-related macular degeneration, which afflicts 30% of patients over 75 and for which only one FDA-approved treatment is currently on the market.

Advantages

· Actively inhibits AP activation while leaving other complement factors fully functional

· Simple, low-cost process
· Consists entirely of human components

Institution

Rice University

Inventors

Nancy Turner