

Development of New Diagnostic Tests to Categorize Different Subtypes of Immune Thrombocytopenia (ITP)

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One of the most common underlying disease mechanisms involved in ITP includes removal of platelets from the immune system due to antiplatelet antibodies. When antiplatelet antibodies are present there are a reduced number of platelets in circulation. It is critical to be able to detect and measure ITP related antiplatelet antibodies as this would allow physicians and scientists to develop a diagnostic test for ITP, identify at-risk patients and determine best treatment options.

Physician-reported data from the McMaster ITP Registry previously identified adult ITP patients to test for the presence of anti-platelet antibodies, and despite using strict eligibility criteria, only 48% had identifiable antibodies.

Within this study, we set out to determine what antibodies can be found in ITP patients and what are the possible mechanisms of action in patients' serum (that may or may not contain antiplatelet antibodies) that can lead to different ITP subtypes, such as ITP due to platelet under production or platelet destruction or both, in ITP.

Tests were developed to analyze platelet production, using stem cells from ITP patients, and to analyze platelet destruction, using monocytes from ITP patients (the cells that make macrophages that destroy platelets). The test could also detect when a platelet was in the process of being destroyed.

It was found that specific factors in the serum of ITP patients did not impact the growth and development of megakaryocytes; however, they did affect the megakaryocyte's ability to produce platelets in many with ITP. It was also found that when you take the monocytes from the blood of an ITP patient (compared to monocytes from healthy controls) and you expose platelets coated with the patient's own plasma (or a monoclonal antibody from mice that resembles antibodies in ITP) there is a 5-10-fold increased rate of platelet destruction among ITP patients.

The McMaster ITP patient registry that contains over 1,200 clinically defined ITP samples at various phases of ITP disease, and the plan moving forward is to apply these tests developed through this study to accurately identify subtypes of ITP and study mechanisms that cause low platelet counts, while working to enhance methods used in the lab to identify antiplatelet antibodies. These next steps will allow for more personalized patient-centered care among ITP patients.

PDSA has designed our research program to specifically focus on patient priorities and funds studies that will make a significant impact on ITP diagnosis, therapies, and quality of life. If you'd like to donate to our research fund, please visit <https://www.pdsa.org/pdsa-donation.html>.