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Reduced Heart Transplant Rejection by Desensitising Antibodies

According to new research presented at Heart Failure 2017 and the 4th World Congress on Acute Heart Failure, it may be possible to reduce the risk of heart transplant rejection by desensitising patient antibodies.

See Also: Treatment Options for Heart Failure

Before any heart transplantation procedure, the serum of heart transplant candidates is tested for anti-human leukocyte antigen (HLA) levels. This is because these antigens can bind to donor HLA antigens which could result in the body rejecting the organ. A virus crossmatch is thus conducted to determine if the patient's anti-HLA antibodies are directed against the donor's HLA antigen. This is called "donor specific anti-HLA antibody" (DSA).

As lead author Dr Guillaume Coutance, a cardiologist at Pitié-Salpêtrière Hospital in Paris, France explains, heart transplantation is typically not performed in patients with a high DSA level as there is a risk of antibody-mediated rejection. The patient then has to wait for a different donor.

Pitié-Salpêtrière Hospital began a densitisation programme in 2009 in order to reduce the chance of rejection in patients who are at high immunological risk. During this study, the researchers analysed the impact of this programme on survival after heart transplantations that were performed from 2009 to 2015.

Desensitisation is measured by mean fluorescence intensity (MFI). MFI between 500 and 1000 is considered "low DSA" which anytihng over 1000 is considered "high DSA". All patients who were desensitised received anti-thymocyte globulins and conventional immunosuppressive therapy (calcineurin inhibitors, mycophenolate mofetil, and corticosteroids). Those with low DSA levels also received intravenous immunoglobulins while patients with high DSA levels received plasmapheresis both before and after transplantation followed by intravenous immunoglobulins.

523 patients with an average age of 50 years were included in the study. 46% of these patients had no DSA; 17% had low DSA and 37% had high DSA levels. All patients were followed up for an average of 3.7 years. Patient survival was compared for all three groups.

Findings showed that patients with high DSA were much younger than those with no or low DSA. High DSA patients were also more likely to be female and had a ventricular assist device. Length of survival after transplantation was similar in all three groups. One year survival was 79% for those with no DSA, 80% in patients with low DSA and 84% in those with high DSA levels. Survival rates at end of follow-up was 73% for patients with no DSA, 72% in patients with low DSA and 76% in patients with high DSA levels.

The group with the most common antibody-mediated rejections was the one with the high DSA levels. Rejections occurred early and they also had more bleeding complications due to perioperaitve plasmapheresis.

According to Dr. Coutance, pre and post-operative plasmaphereiss resulted in a dramatic drop in DSA levels and also reduced the risk of hyper-acute rejections and early antibody-mediated rejections. While antibody-mediated rejections were frequent, they were not associated with poor outcomes. This may be due to early diagnosis of rejection and repetitive routine biopsies as well as aggressive treatment of rejections with plasmapheresis and intravenous intravenous immunoglobulins.

He concluded: "This desensitisation programme could shorten waiting times and increase access to transplantation for patients at high immunological risk. However, it will probably not increase the number of transplantations since donor shortage is the limiting factor."

Source: European Society of Cardiology
Image Credit: Pixabay

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