C1q binding HLA antibody assay – How do we approach it?

Borae G. Park,

Department of Laboratory Medicine, Yonsei University College of Medicine, Seoul, Korea

Luminex panel reactive antibody (PRA) assays, which are commonly used to evaluate perioperative condition of kidney transplant recipients, provide exquisite sensitivity and specificity to detect HLA antibodies. However, these assays do not distinguish complement fixing from non-complement fixing antibodies, which are considered the most clinically relevant in the peri-transplant period.

C1q binding HLA antibody assay (C1q assay) can distinguish HLA antibodies that can bind the first component of complement (C1q). These antibodies have the capacity to initiate the complement cascade. C1q assay detects complement fixing HLA antibodies more sensitive than traditional complement dependent cytotoxicity (CDC) assay. C1q binding donor specific antibody (DSA) around kidney transplantation was reported as a useful prognostic factor in allograft survival. However, there have been controversies that C1q PRA assay itself is useful to reduce antibody mediated rejection or not.

In the laboratory aspects, several issues about C1q assay have been reported such as correlation between HLA single antigen beads (SAB) assay and C1q assay, the concordance between CDC crossmatch and C1q assay, the sensitive detection of C1q binding DSAs, and the test indication of C1q assay etc. Although the C1q assay is useful in monitoring HLA antibodies during desensitization procedures, but the clinical significance of positive C1q binding DSAs is still controversial.

After the review of the principle of C1q assay and the mechanism of initiating complement cascades from conformational changes in C1q binding sites, we can find the key of understanding this assay how we approach and interpret this assay.