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Comparison of the prognostic value of 3 different single antigen tests

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Background: Single antigen (SA) tests are indispensable for HLA antibody identification. Three tests are available from different companies, but little is known about their comparative prognostic value.

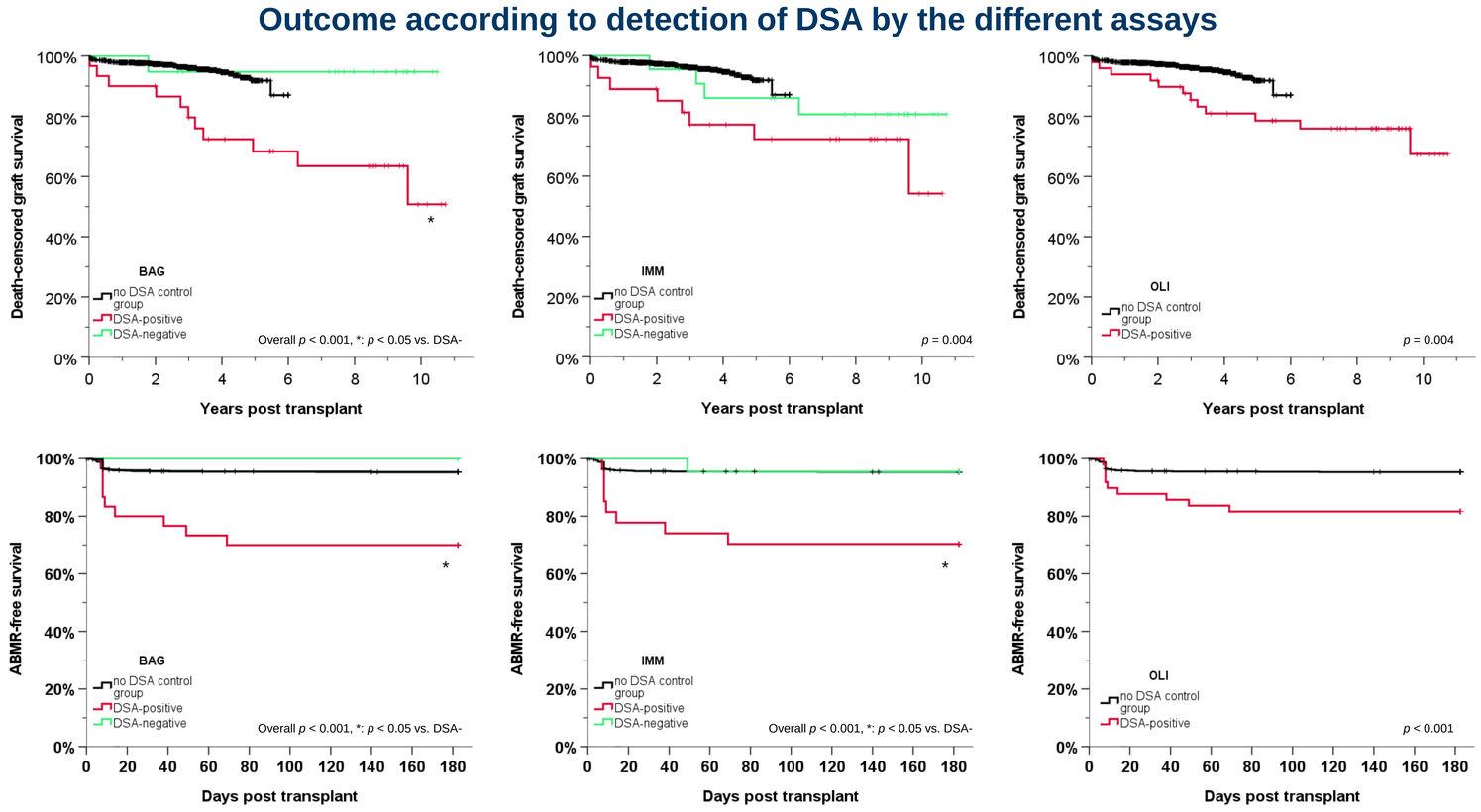
Methods: Sera from kidney transplant patients with preformed donor-specific antibodies (DSA) were selected from a multicenter study. All 49 sera with sufficient aliquots were tested by a microspot SA test from BAG and bead array SA assays from Immucor/Werfen (IMM) and ThermoFisher/OneLambda (OLI). ABMR-free survival within 6 months posttransplant and 10-year death-censored graft survival (10yGS) were evaluated according to (1) number of SA tests classifying the serum as DSA-positive (DSA+), and (2) number of SA tests detecting at least 1 identical DSA specificity.

Results: Independent of the assay used, DSA-positive patients had worse outcome than DSA-negative patients (see figures on the right hand side).

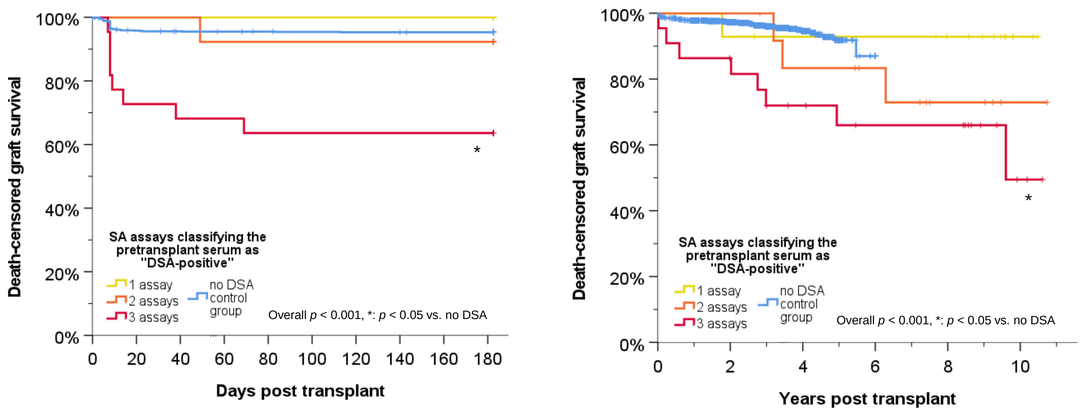
(1) Number of SA tests classifying the serum as DSA+

22 sera were DSA+ by all tests and had highest incidence of ABMR and lowest 10yGS:

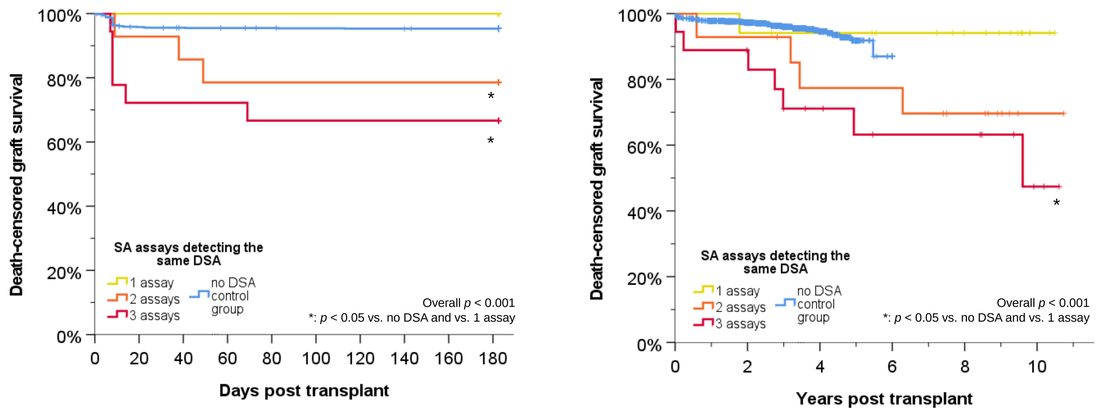
Outcome according to detection of DSA by the different assays



Outcome according to number of assays classifying as "DSA-positive"



Outcome according to Nº of assays detecting at least 1 identical DSA



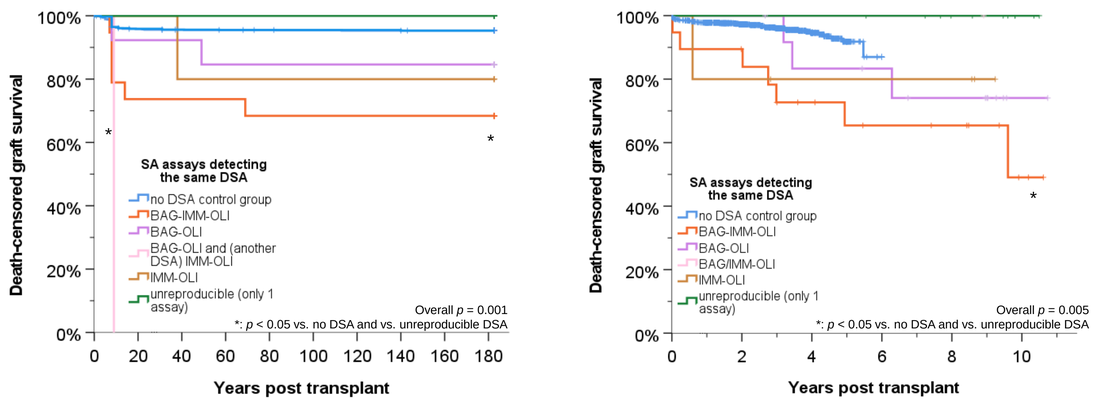
The OLI assay was most sensitive and classified all sera as DSA+, that were DSA+ by BAG and/or IMM. It was the only test detecting DSA in 13 sera which were DSA-negative (DSA-) by both BAG and IMM; however, these patients had similar ABMR-free survival and 10yGS as patients without any DSA. Overall, BAG and IMM seemed to have comparable sensitivity: 8 sera were DSA+ by BAG and OLI, and 4 sera DSA+ by IMM and OLI. Additional review of SA results revealed that some OLI results had been influenced by false positive reactions due to denatured beads or high background, while some weak reactions in the BAG test had been missed in standard evaluation. Correction of these misinterpretations did not significantly change the above-mentioned results.

(2) Number of SA tests detecting at least 1 identical DSA specificity

In 18 sera, at least 1 DSA was detected by all tests. These patients had significantly more ABMR and worse 10yGS. In 15 sera, the same DSA was detected by IMM and OLI, or by BAG and OLI, respectively. These patients had significantly more ABMR, but no significant difference in 10yGS. In 22 sera, DSA were detectable by 1 or more tests, but no specificity was positive in more than 1 assay (in all 22 sera DSA were detected by OLI, in 1 additionally another DSA by IMM, and in 2 another DSA by BAG). Incidence of ABMR and graft survival were similar to DSA- patients.

Outcome according to assays detecting at least 1 identical DSA

Due to low numbers in each group, there were no clear differences between providers.



Conclusion: OLI was the most sensitive assay but was also prone to false positive results. While false positive reactions were rare for BAG and IMM, these tests missed some DSA associated with an increased risk for ABMR. There was no clear difference in the prognostic value of DSA detected by BAG and OLI versus DSA detected by IMM and OLI. Larger studies are necessary to confirm these results.

The study was supported by free reagents provided by the companies BAG, Immucor/Werfen and OneLambda/ThermoFisher.

Wissen schafft Gesundheit

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