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A HETEROPHILE SYSTEM IN HUMAN RENAL TRANSPLANTATION

V. RELATIONSHIP OF HETEROPHILE TRANSPLANTATION ANTIGEN AND COMMON ANTIGEN OF ENTEROBACTERIACEAE[1]

JOHN C. MCDONALD, L. M. JACOBBI, AND EMMETT J. JOHNSON

Department of Surgery and Department of Microbiology and Immunology, Tulane University, New Orleans, Louisiana 70115

SUMMARY

Heterophile transplantation antigen and common antigen of Enterobacteriaceae appear serologically to be separate specificities. However, both antigens are common to Enterobacteriaceae, rat erythrocytes, and some human kidneys. Both antigens are obtained from various tissues by the same chemical procedure. Immunity to each antigen is frequently produced by renal transplantation. We suggest that the antigens are either separate molecules which are similar in chemical structure in the region of the antigenic determinant as well as in tissue distribution or separate reactive sites located on the same molecule. The possibility that common antigen may be a human alloantigen raises theoretical possibilities relative to susceptibility to infection and pyelonephritis, as well as to its relationship to histocompatibility.

Previous publications in this series have presented data relating a heterophile system of antigens and antibodies to human renal transplantation (*7–12*). We have called the system the heterophile transplantation antigen (HT-A) system. Its salient features can be summarized as follows.

The antigen is present in some but not in all human kidneys (*11*). It is present on rat erythrocytes, but not on sheep erythrocytes. It is present on many Gram-negative bacteria (*7, 10*). We have not examined Gram-positive bacteria for the presence of the antigen and thus do not know whether it is restricted to Gram-negative organisms.

Immunity to HT-A is acquired naturally from exposure to colonic flora and is boosted by infection with appropriate bacteria or the transplantation of tissue containing the HT-A (*8, 12*). Patients with detectable anti-HT-A in their serum before renal transplantation who receive a kidney containing HT-A are likely to experience complete accelerated acute rejection or acute rejection which may or may not be controlled by therapy. Patients without detectable anti-HT-A immunity before transplantation can be divided into two groups. One group has the HT-A as an autogenous antigen, cannot develop anti-HT-A immunity, and will not experience a heterophile based rejection. The other group does not carry the HT-A but does not have detectable immunity to it (although they are "subliminally" immune because of prior exposure). These patients may experience a heterophile related rejection if they receive a kidney containing HT-A which, again, may or may not be controlled by treatment.

In an earlier publication, we called attention to the facts that the HT-A and common antigen (CA) of Enterobacteriaceae had a number of similarities and that some patients who had anti-HT-A immunity could be shown to have low titers of anti-CA activity in their serum (*7*).

The CA of Enterobacteriaceae was first described by Kunin et al. (*5*) and has aroused considerable research interest. CA has been reported in human kidneys (*10*) and immunity to CA protects against pyelonephritis in rabbits (*3*). The possibility exists that CA and HT-A are antigens which cross-react with similar antibodies or alternatively might be the same

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