Surgical Forum

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plates were gently rinsed of non-
were then examined by inverted phase
plates scored on the basis of the number
per 150× microscopic field.

Sults

Posttransplant nephrectomy showed
 donor kidney cells, but also against
-A antigens. For example, patient 8
ated by a graft (HL-A2, 10;12, W17)
2, 11;5, 12), (HL-A1, 2;8, 18),
9, 10; W5, W15); but not to
or (HL-A11, W32; W5, X). This
was consistent with the specificity of
his skin reactions to purified HL-A

while in the midst of a rejection epi-
ria. The degree of specific reactivity
ents posttransplant nephrectomy or,
the reactions of peripheral leukocytes
depletion of cells directed against
example, patient 2 (HL-A2, 28,17,
ining (HL-A2, 28;14, 27) was un-
d toward targets bearing (HL-A1,
the phenotypes (HL-A2, W32; 8,
). Similarly patient 4 (HL-A9, 11;
with (HL-A2, 11; W5, W15) de-
10; W5, W15) and (HL-A1, 30;14,
11; W5, W15), (HL-A2, W32; 8,

DOM intervals during the first month
reacted toward donor cells in vitro,
ence of clinical rejection for 60 days.
actions toward donor targets at four
clinical evidence of rejection, based
data, and nuclide scanning. Patient 1
from donor with (HL-A 3, 9,7, 8)
tested at 25 days post transplant;
acted to donor cells and to targets
, but not to those bearing (HL-A2,
5, W15). Five days later clinical
signs (HL-A2, 28;17, 18) engrafted with
(3 (HL-A1, 30;14, X), (HL-A2,
5, W15) but not (HL-A11, X;W5,

W15) four days prior to the onset of a rejection episode. All of the
patients who displayed positive reactions underwent transplant rejection.
On the other hand, rejection was never observed within six days of a negative reaction.

Discussion

The results reported here have compelling implications for the
immunodiagnosis of transplant rejection. The test may distinguish patients
with circulating immunoreactive cells prior to clinical evidence of re-
jection. This method reflects modifications of the techniques reported
earlier by Govaerts, by Wolf et al, and by Quadracci et al, as noted
earlier (1). The advantages of the present method, which are reflected
in its enhanced sensitivity in the detection of cellular immunity, in-
clude (a) the small number of requisite target cells, (b) the relatively
short incubation period, (c) its simplicity and flexibility, and (d) its
apparent dependence on antigen recognition rather than on cellular
destruction. Further experience with the method will ascertain whether its
immunodiagnostic efficiency warrants intensified immunosuppressive
reatment for rejection solely on this basis and without any clinical evi-
dence of graft destruction.

References

pp 507.

Mixed Lymphocyte Culture and Graft Rejection

Noboru Kashiwagi, MD, Jacques Cormor, MD,
Shunzaburo Iwatsuki, MD, Makoto Ishikawa, MD,
Jean Marc Fiala, MD, Torben S. Johansen, MD,
Delia Bethell, MS, and
Thomas E. Starzl, MD, PhD, FACS

HL-A typing has proved to be a poor predictor of kidney compatibil-
(1). It has been claimed that genes determining mixed lympho-
cyte culture (MLC) are apart from those of HL-A (2). Considering

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07772, RR-00051 and RR-00069.
cellular processes in the induction phase of rejection mechanism, MLC would seem to be a logical tool for donor selection.

METHODS

MLC was studied in 42 patients with kidney and 9 patients with liver transplantation. Kidney recipients were divided into primary related (19 patients), primary unrelated (14 patients) and secondary or multiple unrelated transplants (9 patients). None of the first two groups, but all of the last group were under immunosuppression at the time of MLC. Follow-up studies are for one to nine months after transplantation, excluding no patients. Rejection was diagnosed pathologically and by positive findings on two consecutive days of three clinical laboratory tests (blood urea nitrogen, creatinine clearance, and urine sodium concentration for kidney; serum bilirubin, transaminases, and alkaline phosphatase for liver). MLC was performed by Bach's method (3) with modifications. Stimulation index (SI) of MLC was defined by the ratio between the reaction of recipient cells to mitomycin-C-treated donor cells and that to mitomycin-C-treated recipient cells. A SI lower than 10 was considered compatible; those with SI higher than 10 were designated incompatible.

RESULTS AND CONCLUSIONS

The results (Table 1) indicated a positive although imperfect correlation between one-way MLC and the clinical course after primary kidney transplantation, either related or unrelated. A good MLC match was much more common than good HL-A matching. Similar findings have been reported by other authors (4,5), although they have used two-way MLC. Except for the double haplotype identical sibling cases, there was no correlation between HL-A and MLC. Even among these sibling cases there were two patients who rejected kidneys despite an identical HL-A and MLC. This finding and the report of Seigler and associates (6) suggests the possibility that minor incompatibilities may have been responsible. Immunosuppressive therapy apparently affected the MLC results, and the potential ability of the recipient to reject the graft was not adequately expressed by the MLC (Table 1). With liver transplantation, there has not yet been a correlation between outcome and MLC.

REFERENCES


Table 1—MLC and Graft Rejection

<table>
<thead>
<tr>
<th>MLC-SI</th>
<th>CASES WITH REJECTION</th>
<th>CASES WITH NO REJECTION</th>
<th>GRAFTS LOST</th>
<th>GRAFTS DEAD</th>
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Organ Transplantation
SURGICAL FORUM:

Organ Transplantation

11. ORGAN TRANSPLANTATION

The mechanism of rejection, MLC

Selection.

Kidney and 9 patients with liver

divided into primary related

e and secondary or mul-

incompatible with the report of

The unique role of minor incompatibilities may

decay of the recipient to reject the

Table 1—MLC and Graft Rejection

<table>
<thead>
<tr>
<th>MLC SI</th>
<th>CASES WITH REJECTION</th>
<th>CASES WITH NO REJECTION</th>
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<th>Patients Dead*</th>
<th>Range of MLC-SI</th>
<th>Cases with Graft Lost</th>
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<td>7</td>
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<td>0</td>
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<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0.6 ~ 0.72</td>
</tr>
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</table>

Related Primary Kidney Grafts

Unrelated Primary Kidney Grafts

>10 5 0 0 13.5 ~ 46.6 0 0 0
<10 1 0 0 2.2 8 1 1 0.9 ~ 5.8

Unrelated Secondary or Multiple Kidney Grafts

>10 1 0 0 22.2 0 0 0
<10 4 3 3 0.7 ~ 4.1 4 0 0 2.1 ~ 3.3

Liver Transplant

>10 1 0 0 39.9 3 3 3 19.4 ~ 39.8
<10 3 1 1 2.5 ~ 3.2 2 1 1 0.7, 2.6

* Patients who died are listed in this column and, in addition, their kidneys are also listed in the grafts lost column. Note that all but one of the lost grafts were because of death.
RECOVERY FROM HEPATORENAL SYNDROME AFTER SUCCESSFUL ORTHOTOPIC LIVER TRANSPLANTATION

SHUNZABURO IWATSUKI, MD, JACQUES CormAN, MD, MORDECAI POPOVTZER, MD, MAKOTO ISHIKAWA, MD, AND THOMAS E. STARZL, MD, PhD, FACS

INASMUCH AS THE KIDNEY failure of the hepatorenal syndrome (1) is believed to be secondary to hepatic dysfunction, replacement of the diseased liver should improve renal function. This objective was realized in three patients with the hepatorenal syndrome treated by orthotopic liver transplantation.

CASE MATERIAL

The patients, who were 34, 42, and 44 yr old, suffered from cirrhosis. They had massive ascites and edema and two of them were in stage III or IV coma. All had had normal renal function documented within a few weeks of transplantation, but progressive renal failure had then supervened with azotemia and oliguria. Two patients had a preoperative urine sodium concentration of less than 1 mEq/liter, while in case 3 it was 40 mEq/liter. The degree of combined renal and hepatic failure can be seen in Table 1.

RESULTS

Hepatic function in all three patients steadily improved after liver replacement (Table 1), but the course of recovery of kidney function varied. In cases 1 and 3 the characteristic urine findings, including

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From the Departments of Surgery and Medicine, University of Colorado Medical Center and the Denver VA Hospital. Supported by the Veterans Administration, National Institutes of Health grants AI-AM-08898 and AM-07772, and Division of Research Resources grants RR-00051 and RR-00069.