Abstract

Objectives: Living-donor kidney transplant from donors who are chronically infected with hepatitis B virus can be considered as a possibility to compensate for insufficiency of organ transplants, particularly in a hepatitis B virus endemic country. In this study, the safety and efficacy were reviewed retrospectively in living-donor kidney transplant from donors who were chronically infected with hepatitis B virus.

Materials and Methods: In the years between 2012 and 2013, we transplanted 4 renal grafts from hepatitis B surface antigen-positive living donors to antihepatitis B antibody-positive recipients. Lamivudine was prescribed for recipients after transplant without hepatitis B immunoglobulin.

Results: In 1-year follow-up, there were no abnormal findings in the levels of renal and liver enzymes, and there was no unwanted seroconversion to positive hepatitis B surface antigen.

Conclusions: When combined with careful hepatitis B virus-monitoring, renal grafts from hepatitis B surface antigen-positive living donors can be transplanted to hepatitis B antibody-positive recipients, without the need for hepatitis B immunoglobulin prophylaxis, in a hepatitis B virus endemic country.
antihepatitis B core antibody (anti-HBc Ab) immunoglobulin G (IgG) (Table 1).

Lamivudine was prescribed for recipients after transplant. But hepatitis B immunoglobulin was not prescribed. In all cases, basiliximab for induction agent and tacrolimus, mycophenolate mofetil, and steroid for maintenance agent were used. In 1 of 4 cases, the living donor was ABO incompatible. All patients were monitored for liver and renal function and hepatitis B viral status including HBsAg and anti-HBs Ab titer every 3 months during 1 year after transplant. In this center, the HBV-infected recipients from HBs Ag positive donors took lamivudine for 3 months.

Table 1. Demographic and Clinical Characteristics From Hepatitis B Surface Antigen-Positive Donor To Antihepatitis B Surface Antibody-Positive Recipient

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>Case 1</th>
<th>Case 2</th>
<th>Case 3</th>
<th>Case 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age (donor/recipient) (y)</td>
<td>29/55</td>
<td>24/53</td>
<td>54/28</td>
<td>43/46</td>
</tr>
<tr>
<td>Donor HBsAg</td>
<td>++</td>
<td>++</td>
<td>++</td>
<td>++</td>
</tr>
<tr>
<td>Donor HBcAb / anti-HBc Ab</td>
<td>++</td>
<td>++</td>
<td>++</td>
<td>++</td>
</tr>
<tr>
<td>Donor anti-HBc Ab (IgM / IgG)</td>
<td>++</td>
<td>++</td>
<td>++</td>
<td>++</td>
</tr>
<tr>
<td>Recipient HBsAg</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Recipient anti-HBs Ab titer (IU/L)</td>
<td>&gt;1000</td>
<td>477</td>
<td>137</td>
<td>54</td>
</tr>
</tbody>
</table>

Abbreviations: anti-HBc Ab, antihepatitis B core antibody; anti-HBc Ab, antihepatitis B extracellular antibody; anti-HBs Ab, antihepatitis B surface antibody; HBsAg, hepatitis B surface antigen; HBcAb, hepatitis B extracellular antigen; IgG, immunoglobulin G; IgM, immunoglobulin M

Results

Mean age of donor and recipient were 37.5 and 45.5 years. The recipients were 2 men and 2 women. The follow-up was 18.0 ± 8.79 months. In serial follow-up, there were no abnormalities of renal and liver enzymes. At 1 year after kidney transplant, liver enzymes including aspartate aminotransferase (mean, 32.52 ± 14.57 U/L) and alanine aminotransferase (mean, 35.07 ± 17.42 U/L), and renal function tests including blood urea nitrogen (mean, 2.34 ± 0.82 mmol/L) and creatinine (mean, 94.48 ± 37.08 μmol/L), were normal. No patients had unwanted seroconversion to positive HBsAg without hepatitis B immunoglobulin. There were no events of graft rejection, HBV activation, or mortality.

Discussion

Accepting kidney transplant from HBsAg-positive donors has been used as a means to achieve a wider donor pool in countries in which HBV is endemic. Most reported experience involves deceased donors.4 Renal transplant from HBsAg positive donors to HBsAg negative recipients successfully using natural immunity began to emerge in endemic areas from 1988.6 Living-donor kidney transplant from HBsAg-positive donors to hepatitis B antibody-positive recipients were reported in only 45 cases in Hong Kong, Saudi Arabia, Turkey, and the United States.1-3,5,6 These data came from endemic areas, where the prevalence of natural immunity was high.

To minimize the risk of infectious complications, HBsAg-positive recipients often are administered prophylactic antiviral drugs such as lamivudine and hepatitis B immunoglobulin.7,8 In a meta-analysis in 2005, the seroconversion of seropositive HBsAg from negative in kidney recipients showed increased graft failure and mortality.9 With respect to lamivudine and hepatitis B immunoglobulin, there was no standard strategy.2 However, Chung and coworkers recommended lamivudine treatment for 12 months with known HBV DNA positive status of donor.7

The risk for HBV reactivation in recipients with immunologic markers of past infection (HBsAg-negative, anti-HBc Ab-positive, anti-HBs Ab-positive) is < 5%.10 After transplant, the risk of infectious complications with HBV depends on the infectious status of the donor and recipient. Therefore, it is important to evaluate the risk of infectious complications measured that can be applied different detailed examination than a uniform guideline after transplant.11 Strict risk assessment is needed.

An absolute protective threshold of anti-HBs Ab titer is not yet defined in kidney recipients for hepatitis B immunoglobulins. Careful monitoring strategy can be applied to avoid unnecessary drug administration and various adverse events and to identify patients at risk for HBV reactivation.11

Sumethkul and associates suggested that the positivity of HBsAg in donors was not associated with evidence of active liver disease after kidney transplant in HBV-endemic areas with 10-year follow-up.12 Many authors suggested that allocation of renal grafts from donors with HBsAg may be permitted in HBV endemic areas.12,13 In a recent study, Tuncer and coworkers suggested that HBsAg positivity is not a contraindication for living-donor kidney donation.5

In summary, when combined with careful HBV-monitoring, renal grafts from HBsAg-positive living
donors can be transplanted to hepatitis B antibody-positive recipients without the need for hepatitis B immunoglobulin prophylaxis in an HBV-endemic country.

References

1. al-Khader AA, Dhar JM, al-Sulaiman M, et al. Renal transplantation from HBsAg positive donors to HBsAg negative recipients. BMJ. 1988;297:854.
6. Chan MK, Chang WK. Renal transplantation from HBsAg positive donors to HBsAg negative recipients. BMJ. 1988;297:522-523.