Simultaneous Pancreas-Kidney Transplantation: Infectious Complications and Microbiological Aspects


ABSTRACT

Objective: The purpose of this study was to describe the clinical and microbiological characteristics of the infectious complications among simultaneous pancreas-kidney transplantations (SPKT).

Materials and methods. Among the first 45 SPKT the mean age was 34 years (range, 21 to 49) and the mean duration of follow-up 13 months (range, 2 to 27 months).

Results: Twenty-three patients (51%) presented at least one to three episodes (1.7 mean) of infectious complications that needed hospitalization. The etiology of the infections included 71% bacterial (44% gram-negative rods and 27% gram-positive cocci), 16% viral (12% from CMV and 4% from Herpes sp) and 13% fungal (8% by Candida sp and 4% by others fungus). Wound and urinary infections were most frequent, occurring in 22% and 28% of the patients, respectively. All patients who were submitted to vesical drainage developed infections in contrast a rate of only 44% among patients undergoing enteric drainage.

Conclusion: Infectious complications are the main cause of morbidity and mortality following simultaneous pancreas-kidney transplantation, especially with vesical drainage. The use of enteric drainage combined with administration of broad spectrum prophylactic antibiotics is recommended.

Simultaneous pancreas-kidney transplantation (SPKT) appears to be the best treatment to achieve a normoglycemic state for patients with long-term diabetic complications and chronic renal disease. Although the technical success rate of simultaneous pancreas-kidney transplantation has improved, the morbidity remains high mainly due to infections. The purpose of this study was to describe the clinical and microbiological characteristics of the infectious complications in an SPKT program.

Patients and Methods

Data were collated regarding infectious complications of the first 45 patients submitted to combined pancreas-kidney transplantation (SPKT) from December 2000 to March 2003. All patients had been previously diagnosed as having type 1 diabetes and chronic renal failure. Wisconsin solution was adopted for perfusion in every donor. A decontamination solution (neomycin, amphotericin, and PVPI) was administered by nasogastric tube in every donor.

The surgical technique included a midline abdominal incision with dissection of the right iliac vessels. The portal vein was implanted onto the external iliac vein and the arterial reconstruction of superior mesenteric and splenic arteries was performed using a “Y” graft of donor iliac artery. The kidney was always implanted in the left lower quadrant. The exocrine drainage was performed into the bladder in the first seven cases and into the small bowel in the remaining ones.

In the first 14 cases, immunosuppression used cyclosporine, mycophenolate mofetil (MMF), and steroids. In the remainder, cyclosporine was changed to tacrolimus. No induction therapy was used in these series. The antimicrobial prophylactic scheme included ampicillin (4 g/d) and cefotaxime (3 g/d).

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RESULTS

This study of 45 adult patients (23 female and 22 male) of mean age 34 years (range, 21 to 49) was of mean duration 13 months (range, 2 to 27 months). The acute rejection rate was 34%. Twenty-three patients (51%) had at least one to three (1.7 mean) infectious complications requiring hospitalization. The infectious agents included: 71% bacterial (44% gram-negative rod and 27% gram-positive cocci), 16% viral (12% from CMV and 4% from Herpes sp) and 13% by fungal (8% by Candida sp and 4% by others fungus). Wound and urinary infections were most frequent, occurring in 22% and 28% of the patients, respectively (Table 1). Bacterial infections were diagnosed at 65 days (mean) after transplantation, fungal infections at 14 days (mean) after transplantation. Bacteremia was diagnosed in 13% of infected patients normally between the fifth and seventh day after transplantation. Infectious complications were responsible for 50% of the mortality. All patients undergoing vesical drainage showed infections in contrast to only 44% of patients with enteric drainage.

DISCUSSION

Despite improvements in the results with simultaneous pancreas-kidney transplantation, infectious complications remain the main cause of morbidity and mortality, especially in diabetic patients. These patients normally show alterations of neutrophils and macrophages and also a poverty of tissue microvascularization, all of which contribute to infective dissemination. High doses of immunosuppressives also worsen individual responses to important infections. Another special feature of this kind of transplantation that facilitates infection is the high possibility of urinary tract or peritoneal cavity infection by bacteria from the duodenum of the donor.

In addition, 51% of our patients required hospitalization for infection. Our rate of infection seems to be lower than those in the literature, which show rates up to 79%. One probable cause of this smaller infection rate may be that we do not use induction schemes and prefer a lower degree of immunosuppression compared to other centers.

Even using prophylactic antibiotics, there was a high rate of bacterial infectious complications, especially urinary tract and wound infections, which were caused mainly by gram-positive cocci and gram-negative rods. A special feature of these infections was their quick progression, which required us to develop prompt detection schemes and to institute aggressive large spectrum antibiotic coverage. Surgical intervention was also of great value when indicated.

The most accepted method for exocrine drainage of simultaneous pancreas-kidney transplantation is vesical drainage (VD). Despite the improvements in graft and patient survival frequent use of this technique produces a greater number of infectious urological complications. Although appropriate treatment can resolve most of the complications, this event often requires additional operative interventions, which may increase long-term morbidity or jeopardize graft function. As a result of the severity of these urological complications, some centers use primary enteric drainage (ED) as the method of choice for pancreatic transplantation.

Enteric drainage of the pancreas is more physiologic. It shows similar results to bladder drainage, but is beclouded by infectious complications, particularly urinary tract infections. In our series, we found similar results all patients with VD showed infections, in comparison to 44% among those undergoing ED.

In conclusion, infectious complications are the main cause of morbidity and mortality following combined pancreas-kidney transplantation, especially for vesical drainage. In this transplantation modality, wound and urinary tract were the most frequent sites of infections, caused mainly by gram-negative rods and gram-positive cocci. The use of enteric drainage combined with administration of a broad-spectrum prophylactic antibiotic is recommended. Aggressive and early therapy against infections is mandatory.

REFERENCES


Table 1. Infection Distribution According to Infection Sites in 45 Transplanted Patients

<table>
<thead>
<tr>
<th>Place of culture</th>
<th>Infections n (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Superficial surgical wound infection</td>
<td>6 (13)</td>
</tr>
<tr>
<td>Profound surgical wound secretion</td>
<td>4 (9)</td>
</tr>
<tr>
<td>Peritoneal</td>
<td>3 (7)</td>
</tr>
<tr>
<td>Urine</td>
<td>13 (28)</td>
</tr>
<tr>
<td>Sputum</td>
<td>2 (4)</td>
</tr>
<tr>
<td>Blood</td>
<td>3 (7)</td>
</tr>
<tr>
<td>Viral infections</td>
<td>8 (18)</td>
</tr>
<tr>
<td>Others</td>
<td>1 (2)</td>
</tr>
</tbody>
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