Preemptive腎移植
推進へのアプローチ

市立札幌病院 腎臓移植外科
原田 浩

Agenda

PEKT: preemptive kidney transplant

- History and Fact
- Benefit
- New Insight
- Strategy for Success
Definition

preemptive

Pre-emptive (preemptive)
renal, kidney transplantation

PET, PRT, PKT, PEKT

先行的腎移植、維持透析を経ないでの移植
腎代償療法の一つに過ぎません

KRT in Japan

理想

HD

ESKD

PEKT

KTX

PD
1st Paper of PEKT

The 1985 report of the North American Pediatric Renal Transplant Cooperative Study.

*Alexander SR, Adrian GS, Bat M, Cacoub P, Few P,

* * *

Abstract

The report of the North American Pediatric Renal Transplant Cooperative Study summarizes data contributed by 57 participating centers on 754 children with 761 transplants from 1 January 1980 to 15 February 1985. Data collection was initiated in October 1982 and follow-up of all patients is ongoing. Transplant frequency increased with age. 74% of the patients were less than 5 years, 77% being under 2 years. Common frequent diagnoses were aplastic anemia (18%), dilute renal failure (14%), obstructive uropathy (17%), and focal glomerulosclerosis (22%). Preemptive transplantation, i.e., transplantation without prior maintenance dialysis, was performed in 21% of the patients. Disappearance of pretransplant peritoneal dialysis was in 42% and hemodialysis in 29%. Bacterial sepsis occurred in 29% of the transplants. Among cadaver donors, 21% of the donors were under 11 years old. During the first post-transplant month, maintenance therapy was used similarly for both donors and cadaver source transplants, with prednisone, cyclosporine, and azathioprine used in 81%, 80%, and 80%, respectively. Triple therapy with prednisone, cyclosporine, and azathioprine was used in 72%, 76%, and 76% of functioning cadaver source transplants at 90 days, 12 months, and 18 months as compared to 66%, 69%, and 54% for live-donor procedures, with single-dose therapy being uncommon. Rehospitalization during months 1-6 occurred in 52% of patients; 89% of the patients, with treatment of rejection and infection being the two main causes. Additionally, 9% were hospitalized for hypertension. During months 6-12 and 13-17, 30% and 20% of the patients with functioning grafts were rehospitalized. Times to first rejection differed significantly for cadaver and live-donor transplants. The median time to the first rejection was 38 days for cadaver transplants and 178 days for live-donor transplants. Overall, 11% of treated transplants were completely reversible although the complete reversal rate decreased to 27% for four or more rejections. One hundred and fifty-one graft failures had occurred at the time of writing, with a 1-year graft survival estimate of 0.85 for live donor and 0.77 for cadaver source transplants. In addition to donor source, recipient age is a significant prognostic factor for graft survival. Among cadaver donors, decreasing donor age is associated with a decreasing probability of graft survival. Thirty-five deaths have occurred, 19 attributed to infection and 19 to other causes. The current 1-year survival rate is 0.94. There have been 9 malignancies.

1. NAPRTCS
2. PEKT definition
3. 754 Pts/756 KTx
4. PEKT; 21%
2nd Paper of PEKT

Preemptive transplantation—an analysis of benefits and hazards in 85 cases.

Kartik K. V. Kamath, MD, Gordon D. Green, D. Lewis Mix, MD, and Bruce EP. Nunez, MD

Department of Surgery, University of Texas Southwestern Medical School, Dallas, Texas

Abstract

The benefit of transplantation without prior dialysis might be contaminated by the failure to develop possible immunologic disabilities associated with chronic renal disease and dialysis. This study compared graft and patient outcome, cyclosporine toxicity, pharmacokinetics, rejection episodes, nutritional status, and social and occupational rehabilitation between a preemptive group of 85 patients transplanted without prior dialysis and a cohort of 84 demographically, temporally, and disease-matched recipients of renal transplants after a minimum of 6 months of chronic dialysis therapy. The groups were matched for donor type, gender, and age, as well as immunologic risk factors of HLA mismatch and percent panel-reactive antibody. All patients received CsA and prednisone immunosuppression. There were only two differences between the cohorts. The preemptive group included more diabetic patients: 32 versus 15 (P < 0.01). The control cohort included more recipient who had received any pretransplant transfusion: 55 versus 28 (P < 0.01). Both of these factors of having any impact would be expected to reduce graft survival in the preemptive group. All patients in the study had a minimum follow-up of 1 year and over half of the recipients are beyond 40 months. The preemptive patients showed survival rates of 94, 93, and 91 percent at 1, 2, and 5 years; these rates were not significantly different from those of the control group, namely 96, 94, and 89 percent, respectively. The actuarial graft survival rates were 93, 81, 76, 73, and 70 percent at 1, 2, 3, 4, and 5 years, respectively, in the control group, while 96, 81, 70, 67, and 60 percent in the study group. Preoperative blood transfusion or percent positive panel-reactive antibodies had no effect on preoperative outcome or survival rates. The incidence of CsA nephrotoxicity was 5.4 percent in the study group, which was not statistically different from the 7.1 percent in the control group. The incidence of rejection episodes in the absence of patient noncompliance was comparable between the groups. Seven of the immunosuppressive rejection episodes in the preemptive group were due to noncompliance, compared with none in the control group (P < 0.01). Preemptive recipients were also more likely than control group patients to be employed full-time both before transplantation (35 vs. 22, P < 0.05) as well as after transplantation (56 vs. 32, P < 0.01).

2nd Paper of PEKT

Preemptive transplantation—an analysis of benefits and hazards in 85 cases.

Kartik K. V. Kamath, MD, Gordon D. Green, D. Lewis Mix, MD, and Bruce EP. Nunez, MD

Department of Surgery, University of Texas Southwestern Medical School, Dallas, Texas

PEKT 85/non-PEKT

PEKT; DMNx↑, PreTx Transfusion↓

CSA tox, GS, PS; Comparable

PEKT/AR due to Drug NA↑

PEKT/Full time employment↑
1st Paper of PEKT in Hokkaido
1998年日本移植学会総会
血液浄化法を経ずして腎移植を施行した
症例8例の臨床的検討
北海道大学 泌尿器科
○溝口 用・森田 邦宏・長沼章雄・竹村一雄・野々村泰也
○石津 秀男・生島尚清・高橋裕
○永井 翔
○森田要子・池田直由・平野範夫
○馬場 義寛・今村茂義・加藤直行
KRT in Japan
2011年
Living Donor KTx 1,389
Deceased Donor KTx 213
Dialysed Pts 394,836
CKD Pts on WL 12,767
86.2%が生体腎 (2011)
PEKT in SCGH
生体腎総数の推移

Non PEKT LD  PEKT

生体腎の35%がPEKT

PEKTには地域差が

移植外科医の熱意型

20%

移植内科医の熱意型

30%

???
PEKTには国により差がある

Summary; Benefit

☑ もともと行われていたKRT
☑ 1990年ころからの概念
☑ 日本においては15-20%がPEKT
☑ 日本では献腎でのPEKTはほぼない
☑ 地域差がある
Benefit

CKD progression and AEs

0 1 2 3 4 5 HD PD

- Contracted bladder
- Malnutrition/Infection/Cancer development
- CVD risk
- CKD-MBD
- Anemia

CKD progression

PEKI
PEKT benefit, GS/PS

Figure 1: Kaplan-Meier Estimates of Allograft Survival According to the Use of Renal Path of Long Term Dialysis before Kidney Transplantation from a Living Donor.

The preemptive transplantation group had not been treated by dialysis and the non-preemptive transplantation group had been treated by dialysis before transplantation. P=0.009 for the comparison between groups.

PEKT benefit, GS/PS

PEKT, 同一腎での比較
Dialysisの及ぼす影響, Paired Kidneyでの比較
PEKT benefit, GS/PS

@SCGH

PEKTではなぜGS/PSが良いか？
Lead-time bias?

PEKTではARが少ない

Table 2. Rates of biopsy-confirmed acute rejection in the first year post-transplant

<table>
<thead>
<tr>
<th></th>
<th>Pre-emptive (n=1819)</th>
<th>Non-pre-emptive (n=6662)</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>By 7 days</td>
<td>0.22%</td>
<td>0.69%</td>
<td>0.019</td>
</tr>
<tr>
<td>By first month</td>
<td>3.16%</td>
<td>8.13%</td>
<td>0.001</td>
</tr>
<tr>
<td>By third month</td>
<td>6.05%</td>
<td>14.5%</td>
<td>0.001</td>
</tr>
<tr>
<td>By sixth month</td>
<td>7.09%</td>
<td>17.3%</td>
<td>0.001</td>
</tr>
<tr>
<td>By twelfth month</td>
<td>8.63%</td>
<td>20.0%</td>
<td>0.001</td>
</tr>
</tbody>
</table>

PKTでは拒絶反応が1/3-1/2
PEKTではARが少ない

### Table 1. Outcomes in the Study Groups.

<table>
<thead>
<tr>
<th>Outcome</th>
<th>Prescriptive Transplantation (N=1818)</th>
<th>Nonprescriptive Transplantation (N=6662)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Delayed allograft function</td>
<td>2.5</td>
<td>5.1</td>
</tr>
<tr>
<td>Biopsy-confirmed acute rejection within 1 year</td>
<td>5.5</td>
<td>14.6</td>
</tr>
<tr>
<td>Allograft failure</td>
<td>2.8</td>
<td>5.8</td>
</tr>
<tr>
<td>Death</td>
<td>0.2</td>
<td>0.3</td>
</tr>
<tr>
<td>Repeated transplantation</td>
<td>&lt;0.1</td>
<td>0.1</td>
</tr>
<tr>
<td>Long-term dialysis</td>
<td>3.5</td>
<td>5.4</td>
</tr>
</tbody>
</table>

*The prescriptive-transplantation group had not been treated by dialysis, and the nonprescriptive-transplantation group had been treated by dialysis before transplantation.

†Delayed allograft function was defined by the use of dialysis within the first week after transplantation.

PEKTではTcell機能が低下

Initiation of Hemodialysis Treatment Leads to Improvement of T-Cell Activation in Patients With End-Stage Renal Disease

Harald Kaal, MD; Matthias Gimm, MD; Ursula Seiler, MD; Martina Seiler, PhD; and Hans Kühler, MD
PEKTではT cell機能が低下

Initiation of Hemodialysis Treatment Leads to Improvement of T-Cell Activation in Patients With End-Stage Renal Disease

Harald Kasl, MD, Matthias Gintz, MD, Urban Sester, MD, Martin Sester, PhD, and Hans Koller, MD

Fig 2. T-cell proliferation during initiation of hemodialysis treatment after supplementation with anti-CD 28 antibodies. PBls of patients were drawn before the first (T, HD), before the fourth (N, HD), and after 6 weeks on intermittent hemodialysis before each hemodialysis treatment, and T-cell proliferation was determined after stimulation with PHA, 250 ng/mL, and PHA, 250 ng/mL, + anti-CD28 Ab, 500 ng/mL (C). Stimulation index is defined as counts with stimulation in relation to counts without stimulation. Data expressed as mean ± SEM.

Costimulation functionが低下？

PEKTでは動脈硬化が少ない

<table>
<thead>
<tr>
<th></th>
<th>AS(+)</th>
<th>AS(-)</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>PEKT</td>
<td>0</td>
<td>8</td>
<td>8</td>
</tr>
<tr>
<td>non-PEKT</td>
<td>30</td>
<td>30</td>
<td>60</td>
</tr>
</tbody>
</table>

ilio artery, p<0.01

動脈硬化が少ないと移植腎着生が良い

@SCGH
手厚いCKD管理のおかげ？

☑ Private Insurance
☑ Early referral
☑ 大規模医療機関
☑ 経験豊富なNephrologist
☑ 都市部での診療
☑ 付随するScreeningの勧行

GS/PS以外のbenefit
PEKT の方が伸びる

<table>
<thead>
<tr>
<th></th>
<th>移植時</th>
<th>移植後3年</th>
</tr>
</thead>
<tbody>
<tr>
<td>Overall</td>
<td>-1.47±1.22</td>
<td>-1.47±1.22</td>
</tr>
<tr>
<td>Pre-emptive</td>
<td>-2.19±2.22</td>
<td>-1.87±2.60</td>
</tr>
<tr>
<td>Non pre-emptive</td>
<td>-2.86±1.93</td>
<td>-3.22±1.94</td>
</tr>
</tbody>
</table>

15歳未満

<table>
<thead>
<tr>
<th></th>
<th>移植時</th>
<th>移植後3年</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pre-emptive</td>
<td>-0.84±0.73</td>
<td>-0.53±1.65</td>
</tr>
<tr>
<td>Non pre-emptive</td>
<td>-2.86±1.93</td>
<td>-3.22±1.94</td>
</tr>
</tbody>
</table>

15歳～18歳

<table>
<thead>
<tr>
<th></th>
<th>移植時</th>
<th>移植後3年</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pre-emptive</td>
<td>-2.25±1.34</td>
<td>-2.93±0.83</td>
</tr>
<tr>
<td>Non pre-emptive</td>
<td>-1.36±2.38</td>
<td>-0.51±2.51</td>
</tr>
</tbody>
</table>

1996年日本人男児発育標準成長曲線によるP<0.05 vs. Non pre-emptive

PEKT の入院期間は短い

PEKT移植時の入院期間は
透析を経た群よりも1週間短い

hospital stay (day)
PEKT の入院は安い

PEKT移植時の入院費用は
透析を経た群よりも100万円安い

PEKT の膀胱容量は大きい

PEKT移植直後の膀胱容量は
透析を経た群よりも100ml大きい
萎縮膀胱ではVURが多い

頻尿がないという話のみではないです

<table>
<thead>
<tr>
<th>検査項目</th>
<th>VUR (n=32)</th>
<th>No VUR (n=111)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Imx (triple/quadruple)</td>
<td>25/7</td>
<td>77/35</td>
</tr>
<tr>
<td>Age (年)</td>
<td>34.5 ± 1.9</td>
<td>36.1 ± 1.2</td>
</tr>
<tr>
<td>Gender (M/F)</td>
<td>16/18</td>
<td>73/38</td>
</tr>
<tr>
<td>Live/Cadaveric</td>
<td>23/9</td>
<td>96/5</td>
</tr>
<tr>
<td>HD period (y)</td>
<td>31/11</td>
<td>94/7</td>
</tr>
<tr>
<td>Bladder Cap (&gt;50/≤50ml)</td>
<td>24/8</td>
<td>97/4</td>
</tr>
<tr>
<td>AR (yes/no)</td>
<td>9/23</td>
<td>33/78</td>
</tr>
<tr>
<td>Follow-up period (d)</td>
<td>1538.2 ± 158.5</td>
<td>1480.9 ± 84.0</td>
</tr>
</tbody>
</table>

VURは移植腎機能悪化に繋がる

移植後VURのあるなしは移植腎生着率に影響します

[グラフ: Graft Survival]

No VUR (n=111)
VUR (n=32)
p = 0.0332

Days after Transplant

@SCGH
間接的メリット

保存期CKDケアの質の向上

✓ より早期における専門医の診療（Early referral）
✓ 感染症、癌スクリーニング率の向上
✓ ワクチン接種率向上（HBV, pneumococcus）
✓ CVDスクリーニング・積極的IHD除外
✓ CKD-MBD・Anemiaに対する積極的治療

Summary; Benefit

✓ GS/PSが良い
✓ QoLが良い
✓ 医療経済的にも良い
✓ 小児では身長の獲得、精神発達面で利点
✓ 透析に関する事象のBy-pass
✓ 腎臓機能を維持したままの手術
Earlier Is Not Necessarily Better in Preemptive Kidney Transplantation


Early PEKT with higher eGFR does not necessarily improve graft survival after kidney transplantation with lower pretransplant eGFR.
The Impact of Residual Renal Function on Graft and Patient Survival Rates in Recipients of Preemptive Renal Transplants


PEKT should be delayed as long as possible, provided the patient does not have uremic symptoms and dialysis can be safely avoided.

Trends in the Timing of Pre-emptive Kidney Transplantation

Morgan G. Scott, M. Ali S. Moses, Joseph Cavallin, and Dennis L. Rogers

PEKTはDGFを回避するだけ？

Preemptive Living Donor Kidney Transplantation: Do the Benefits Extend to All Recipients?

<p>| TABLE 1. Early and late complications after preemptive and nonpreemptive kidney transplantation |
|----------------------------------|------------------|------------------|------------------|</p>
<table>
<thead>
<tr>
<th></th>
<th>Preemptive</th>
<th>Nonpreemptive</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Early complications</td>
<td>26 (100%)</td>
<td>247</td>
<td>0.038</td>
</tr>
<tr>
<td>Dialysis graft function</td>
<td>7 (4%)</td>
<td>24 (100%)</td>
<td>0.016</td>
</tr>
<tr>
<td>Primary nonfunction</td>
<td>7 (3%)</td>
<td>24 (100%)</td>
<td>0.016</td>
</tr>
<tr>
<td>Acute rejection</td>
<td>26 (100%)</td>
<td>24 (100%)</td>
<td>0.016</td>
</tr>
<tr>
<td>Wound complications</td>
<td>24 (100%)</td>
<td>24 (100%)</td>
<td>0.016</td>
</tr>
<tr>
<td>Late complications</td>
<td>24 (100%)</td>
<td>24 (100%)</td>
<td>0.016</td>
</tr>
<tr>
<td>Cardiac</td>
<td>14 (7%)</td>
<td>24 (100%)</td>
<td>0.016</td>
</tr>
<tr>
<td>Infection</td>
<td>24 (100%)</td>
<td>24 (100%)</td>
<td>0.016</td>
</tr>
<tr>
<td>Surgical</td>
<td>24 (100%)</td>
<td>24 (100%)</td>
<td>0.016</td>
</tr>
</tbody>
</table>

移植腎機能は変わらない

Preemptive Living Donor Kidney Transplantation: Do the Benefits Extend to All Recipients?

![Graph showing isohalamic Clearance](image)

FIGURE 2. Renal function as measured by isohalamic clearance.
Death censored GSの改善

Preemptive Living Donor Kidney Transplantation: Do the Benefits Extend to All Recipients?

(Names and affiliations)

Graphs showing survival rates:
- Patient Survival
- Graft Survival (censoring for patient death)

GSは変わらない

Mean Dialysis 25.6m

Type of Dialysis:
- CAPD
- HD
- Peritoneal KT
censored
HD, censored
Peritoneal KT, censored
献腎でもPSはPEKTで改善

PEKT, Deceased Donor

120,000以上のSRTRのdataの解析
9%がPEKT
PEKT, Deceased Donor

Table 3. Independent associations of early (dialysis) or late (pre-transplant) deceased donor kidney transplant with patient mortality and death-censored graft loss, 1995-2011

<table>
<thead>
<tr>
<th>Adjustment Type</th>
<th>Population Analyzed</th>
<th>Death (Hazard Ratio, 95% Confidence Interval)</th>
<th>Death-Censored Graft Loss (Hazard Ratio, 95% Confidence Interval)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Multi-variable*</td>
<td>Full population*</td>
<td>1.86 (1.86-1.86, P=0.001)</td>
<td>1.21 (1.21-1.21, P&lt;0.001)</td>
</tr>
<tr>
<td>SEER</td>
<td>Full population*</td>
<td>1.86 (1.86-1.86, P=0.001)</td>
<td>1.21 (1.21-1.21, P&lt;0.001)</td>
</tr>
<tr>
<td>Propensity</td>
<td>Propensity matched*</td>
<td>1.86 (1.86-1.86, P=0.001)</td>
<td>1.21 (1.21-1.21, P&lt;0.001)</td>
</tr>
<tr>
<td>Multi-variable*</td>
<td>10-variable matched*</td>
<td>1.86 (1.86-1.86, P=0.001)</td>
<td>1.21 (1.21-1.21, P&lt;0.001)</td>
</tr>
<tr>
<td>Multi-variable*</td>
<td>Recipients under 65 yr</td>
<td>1.86 (1.86-1.86, P=0.001)</td>
<td>1.21 (1.21-1.21, P&lt;0.001)</td>
</tr>
</tbody>
</table>

Table 4. Risk of DWFU by the duration of diuresis exposure between first and second transplantation

<table>
<thead>
<tr>
<th>Duration of diuresis exposure between first and second transplantation</th>
<th>Hazard of increasing duration of exposure between first and second transplantation compared with initial group pre-transplant</th>
<th>1.00</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pre-transplantation</td>
<td></td>
<td>1.00</td>
</tr>
<tr>
<td>6-7 days diuresis</td>
<td>1.20 (1.00-1.44)</td>
<td>1.20</td>
</tr>
<tr>
<td>8-9 days diuresis</td>
<td>1.20 (1.00-1.44)</td>
<td>1.20</td>
</tr>
<tr>
<td>10-11 days diuresis</td>
<td>1.20 (1.00-1.44)</td>
<td>1.20</td>
</tr>
<tr>
<td>12-13 days diuresis</td>
<td>1.20 (1.00-1.44)</td>
<td>1.20</td>
</tr>
<tr>
<td>&gt;14 days diuresis</td>
<td>1.20 (1.00-1.44)</td>
<td>1.20</td>
</tr>
</tbody>
</table>

PEKT, 2nd KTx

2nd KTxでもCSはPEKTの方が良い
2nd KTxでも透析が長いほどDWFUリスクが増加する

(Transplantation 2013:595:705-710)
Summary; New Insight

✓ 短期間の透析はGS/PSに影響しない
✓ 短期間の透析は移植腎機能にも影響しない
✓ 日本では献腎でのPEKTはほぼない
✓ 2nd KTxでもPEKTの方がGSが良い

Strategy for Success
知っていそうで知らない事実

PEKTでも1級になれる

腎移植を行った日から1級です

<table>
<thead>
<tr>
<th>級別</th>
<th>じん腎機能障害</th>
<th>Ccr/itCr</th>
</tr>
</thead>
<tbody>
<tr>
<td>1級</td>
<td>じん腎の機能の持続により自己の生活の自立生活が非常に困難に制限されるもの</td>
<td>&lt;10/8</td>
</tr>
<tr>
<td>2級</td>
<td>じん腎の機能の持続により家庭内で自分の生活が著しく制限されるもの</td>
<td>10-20/5-8</td>
</tr>
<tr>
<td>3級</td>
<td>じん腎の機能の持続により社会での日常生活活動が著しく制限されるもの</td>
<td>20-30/3-5</td>
</tr>
</tbody>
</table>

疑義解釈
腎移植を行ったものは、抗腎炎療法の維持を要する期間は、これを実施しないと再び腎機能の喪失の危険性があるため、抗腎炎療法を実施しないと規定した状態を想定し、1級として認定することが適当である。
PEKTでも補助制度あり

特定疾病療養受験証
保険証（割負担額を）

重症心身障害者医療費助成制度

身体障害者手帳の取得（1～4級）

自立支援医療（基本医療）

臨床家の誤解
sCr and eGFR

CKD保存期からPEKTへ

Nephrologist

移植外科

隔たり？

意思のずれ？

認識の相違？
このような本も横行しています

早期からの情報が重要

PEKT (n=8) non-PEKT (n=61)

情報源

日照療法

情報入手の時期

移植機能

保存性

どちらののどちらでもない
否定的

肯定的

2013年7月14日
早期からの情報が重要

PEKTが叶った理由
- 本人・家族の希望: 48%
- 主治医の薦め: 52%

PEKTが叶わなかった理由
- 本人の誤解: 9%
- 移植医療戦略: 17%
- 社会的事情: 13%
- すでに腎臓病: 17%
- 移植情報提供欠如: 43%
PEKT直前のeGFR
-残腎機能の推移-

eGFR (ml/min/1.73m²)
11.49±0.56  9.53±0.55

5.15M 待期
p=0.0154

受診時 移植直前

PEKTの実態調査

アンケートの配布

CKD担当医

札幌腎疾患セミナー参加の聴衆

腎移植施設

2009年腎移植数上位30位タイの施設
PEKTの実態調査
CKD担当医（回収率25/42, 59%）

PRTを勧めるGFR

- 0.37%
- 37%
- 26%

PRTを勧めるsCr（大人）

- 30を切ったら
- 20を切ったら
- 15を切ったら
- 5を超えたら
- 3を超えたら
- 61%
- 39%

PEKTの実態調査
KTX担当医（回収率31/31, 100%）

- 腎移植の予定はいつまで決定してますか？
- 現在の移植予定にPRTは予定されていますか？

- 15ヶ月前まで
- 3-6ヶ月前まで
- 7-12ヶ月前まで
- 1年以上前まで
- 予定されている
- 予定されていない
- 69%
- 13%
- 19%
- 81%
PEKTの実態調査
KTX担当医 (回収率31/31, 100%)

PRTに対する施設の考え
- 積極的に行うべき (81%)
- 紹介があれば行う (19%)

アクセス作成後のPRT例は?
- 10数例ある (10%)
- 数例ある (39%)
- ない (52%)

PEKTの実態調査
KTX担当医 (回収率31/31, 100%)
PRTを希望する紹介時GFR<10以下の患者さんには

- 決定している移植予定を変更 (16%)
- 通常の移植予定日以外に何とかする (23%)
- 可能な関連施設を紹介する (48%)
- まず透析をする (6%)
- その他 (6%)

透析会誌456: 459-466, 2012
PEKTの実態調査
KTX担当医 (回収率31/31, 100%)

PRT希望者の初診時GFR？
そのうちPRT実施率は？

- 多くは15以下
- 15-19多い
- 20以上が多い
- 80%>
- 60-79%
- 40-59%
- 20-39%
- <20%

選択肢例: 455c: 459-466, 2012

PEKTの実態調査
KTX担当医 (回収率31/31, 100%)

CKD担当医に希望するPRTの紹介のタイミングはGFRで

- >30
- 30-29
- 15-19
- <15

透析会誌455c: 459-466, 2012
MSWの力も無視できない

PEKT実現のための現実

✓ PRTは本邦では献腎移植が非現実的
✓ 多くの施設では数ヶ月～数年先の腎移植の予約が埋まっている
✓ 駆け込み的なPRTは関係者の相当の努力が必要
✓ 早めの腎移植施設への受診が必要
日本の生体腎比率からすると

35%以上のPEKTが理想である！

PEKT実現のために
患者、提供予定者、医療スタッフの心構え

保存期間不全からの移植に対する正しい理解
→PEKT決心

腎提供の決心

腎移植、小児科医

提供者

腎移植

続発機能管理

腎移植、小児科医

PEKT
Table 7: Weighing the prescriptive transplant decision: advantages and risks

Transplant vs. dialysis?

- Reduced mortality: 1 year survival for transplanted kidney is approximately 90% vs. 70% for dialysis
- Greater quality of life: freedom from regular dialysis treatments, ability to travel with less restrictions, lower rates of depression, sleep problems, and sexual dysfunction
- No dietary or fluid restrictions for kidney failure
- Greater ability to maintain employment, thus maintaining health insurance
- Living donation or deceased donation?
  - Living donation:
    - Have a family member or friend who would be a donor
    - Insurance coverage of receiving a matching kidney during an organ shortage
    - Can receive a kidney more quickly because the Donor's heart is still beating
    - Can plan a transplant to be most convenient to recipient's health and donor's schedule
    - Less chance of the recipient suffering from the donor-related technical issues
  - Deceased donation:
    - No family member or friend who would be a donor
    - Rejection generally not longer than 1 year after transplantation
    - Patients generally live longer with prescriptive transplant then if they get transplants after starting dialysis
    - Since patients have some kidney function, they are healthier when undergoing surgery
    - Patients experience less stress because they do not need to start and learn multiple treatment techniques
- Risk to recipient?
  - Risk of death from surgery, primarily due to the risk of anesthesia (1% in 2006)
  - Risk of surgical problems including infection, fever, bleeding, and blood clots, 1%
  - Risk of kidney failure in the first year, 1% to 10%
  - Implantation drugs may not be covered after 2 years
- Risk to living donor?
  - Risk of death from surgery, primarily due to the risk of anesthesia (1% in 2006)
  - Risk of problems for living donors: infection, fever, bleeding, and blood clots, 1%
  - Risk of residual kidney failure in the first year, 1% to 10%
  - Implantation drugs may not be covered after 3 years

PEKT実現の背景

- Private Insurance
- High education
- Caucasian
- Early referral
- Urban residence
- Higher residual eGFR
- DM nephropathy

Fessel et al, NDT 2012
Nephrologistの経験差

A Survey of Nephrologists' Views on Preemptive Transplantation

Françoise G. Pradel,* Rahul Jain,* C. Daniel Mullins,* Joseph A. Vassiliou,* and
Stephen T. Bartlett

Surveyed nephrologists consider PEKT as the optimal modality for eligible patients. Late referral, patient health and insurance status, and delayed transplant center evaluation are perceived as major barriers to PEKT.
# Early referralを妨げる要因

![Figure 1: Factors contributing to delayed discussion about preemptive kidney transplant.](image)

<table>
<thead>
<tr>
<th>要因</th>
<th>因果</th>
<th>重症度</th>
<th>PT</th>
<th>悪性</th>
</tr>
</thead>
<tbody>
<tr>
<td>病状が安定している</td>
<td>Yes</td>
<td>60-100</td>
<td>50</td>
<td>95</td>
</tr>
<tr>
<td>病状の再発が見込ま</td>
<td>No</td>
<td>10-50</td>
<td>9</td>
<td>90</td>
</tr>
<tr>
<td>血圧レベルが高ま</td>
<td>Yes</td>
<td>50-90</td>
<td>10</td>
<td>85</td>
</tr>
<tr>
<td>肝機能が正常</td>
<td>Yes</td>
<td>10-50</td>
<td>90</td>
<td>95</td>
</tr>
</tbody>
</table>

# 先行的献腎移植登録

表1

1. 先行的腎移植の申請が速やかに行われるため、申請書類等において、棄権の基本的棄権と棄権時からみて棄権1か棄権2の棄権データを検討し棄権。
2. 先行的献腎移植の献腎集約状況データカーティー(献腎集約)に必要なる事項を登録し、提供機関の選定にあたって、判定を含めた上で献腎集約ロールバックに検討される。
3. 献腎の適応度の判定は、患者回の献腎集約状況を、判定基準を満たすかを判定。
4. 献腎の適応度の判定が、患者回の献腎集約状況を、判定基準を満たすかを判定。
5. 献腎の適応度の判定が、患者回の献腎集約状況を、判定基準を満たすかを判定。
6. 献腎の適応度の判定が、患者回の献腎集約状況を、判定基準を満たすかを判定。
7. 献腎の適応度の判定が、患者回の献腎集約状況を、判定基準を満たすかを判定。
Summary; Strategy for Success

✓ もともと行われていたKRT
✓ 1990年ころからの概念
✓ 日本においては15-20%がPEKT
✓ 日本では献腎でのPEKTはほぼない
✓ 地域差がある

Conclusion
PEKTまとめ

☑ もともと行われていたKRT
☑ 1990年台はGS/PSが優れていた
☑ 日本においては15-20%がPEKT
☑ 種々のメリットがある。
☑ 増加のためには患者、医療者の啓発が必要
☑ 献腎ドナーの爆発的な増加に期待

ご静聴ありがとうございました

Contributors

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各病院の腎臓内科、内科、小児科の皆様