Rehabilitation in 150 Consecutive Recipients of Renal Grafts
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Reports on rehabilitation of patients following renal transplantation are few (Murray et al., 1967; Cameron et al., 1970; Parsons et al., 1971). Different principles of patient selection and management as well as different divisions into degrees of rehabilitation make comparative evaluation difficult. However, we think it worthwhile to report on rehabilitation in a series of recipients treated uniformly at a single centre.

MATERIAL
The degree of medical and vocational rehabilitation was investigated in the first 150 consecutive patients transplanted in Gothenburg between January 1965 and October 1969. Forty-three patients received their grafts from living donors, and 107 from cadaveric donors. Only primary grafts were considered. Sixty-three patients were females and 87 were males. The mean age was 38 years (range 10-61 years).

METHODS
An estimate of the degree of medical rehabilitation was made according to 'The Human Kidney Transplant Registry' in Boston (Table I). Only patients surviving more than one month with functioning grafts were included in the study. The information was collected from the patients themselves or, in a few cases, from their local nephrologist.

Table I. Division into degrees of rehabilitation

<table>
<thead>
<tr>
<th>Grade</th>
<th>Description</th>
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</thead>
<tbody>
<tr>
<td>Grade 1</td>
<td>Requires continual hospital care.</td>
</tr>
<tr>
<td>Grade 2</td>
<td>Not hospitalised, activities severely restricted.</td>
</tr>
<tr>
<td>Grade 3</td>
<td>Not hospitalised, activities moderately restricted.</td>
</tr>
<tr>
<td>Grade 4</td>
<td>Completely normal.</td>
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</tbody>
</table>

From 'The Human Kidney Transplant Registry'
An estimate of the vocational rehabilitation of the patients was made by investigating the time on sick leave and full pension. Only patients with cadaveric grafts functioning more than four months and patients with living donor grafts functioning more than three months were included. Registration started from the second post-operative month. Patients receiving full pension and patients only partly in work have been recorded as being sick. Two patients younger than 16 years were excluded, as were three patients pursuing studies and one patient with congenital amaurosis. The time on sick leave was recorded in per cent of the total possible time during each period of six months.

RESULTS

The distribution of degrees of medical rehabilitation during different periods after transplantation in 86 recipients of primary cadaveric grafts surviving with functioning grafts more than one month after transplantation is shown in

![Diagram showing rehabilitation levels]

**Figure 1.** Distribution of degrees of rehabilitation in recipients of primary cadaveric-donor transplants

Figure 1. The decreasing number of recipients observed during subsequent periods is due to patient death, graft loss and end of the observation period. As can be seen from the diagram, during the second to fourth post-operative months the majority of the recipients had a low degree of rehabilitation, while from the fifth month a decreasing minority of the recipients were poorly rehabilitated.

Figure 2 demonstrates the distribution of degrees of medical rehabilitation in 41 recipients of living-donor grafts. When compared to the cadaveric
Rehabilitation. Primary living-donor transplants. n=43

Figure 2. Distribution of degrees of rehabilitation in recipients of primary living-donor transplants

donor series it can be seen firstly that even during the first period from the second to the fourth month, 60% of the recipients were considered to be grade 3 or 4 rehabilitated and, secondly, that later in the course only a few recipients were poorly rehabilitated.

Figure 3. Proportion of days on sick leave and full pension (black bars) during various time periods in recipients of primary cadaveric-donor transplants
Figure 3 shows the added number of days on sick leave and full pension in the 59 recipients of cadaveric grafts in per cent of the total possible number of days during different six-month periods. The number of recorded patients decreased due to patient death, graft loss and, in the two later periods, because of the end of the observation time. During the first observation period 96% of the total time was used as sick leave and full pension. During the second period (month 8-13) a rapid reduction to 59% occurred. This figure diminished further during the later periods, and was 39% during the months 32-37.

![Bar chart showing the proportion of days on sick leave and full pension.](chart)

<table>
<thead>
<tr>
<th>Months</th>
<th>2-7</th>
<th>8-13</th>
<th>14-19</th>
<th>20-25</th>
<th>26-31</th>
<th>22-27</th>
<th>38-43</th>
</tr>
</thead>
<tbody>
<tr>
<td>Patients</td>
<td>29</td>
<td>29</td>
<td>27</td>
<td>26</td>
<td>26</td>
<td>26</td>
<td>20</td>
</tr>
<tr>
<td>No.1</td>
<td>1</td>
<td></td>
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<td>TRPL-eclomt</td>
<td>1</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>End of obs time</td>
<td>3</td>
<td>3</td>
<td></td>
<td></td>
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</tr>
</tbody>
</table>

Figure 4. Proportion of days on sick leave and full pension (black bars) during various time periods in recipients of primary living-donor transplants.

Figure 4 demonstrates the same facts in 29 recipients of grafts from living donors. The number of patients observed and the causes of the decreasing number of patients in the later periods is given below the bars. The initial periods demonstrate figures of 72 and 50% respectively of sick leave and pension. During the two last periods only about 20% of the possible time was used for sick leave and continued full pension.

When comparing the vocational rehabilitation of the cadaveric donor and the living donor series it is important to exclude those patients who received full pension because of chronic uraemia before transplantation, since unfortunately it is difficult to rehabilitate these patients in spite of a successful transplant. For instance, if this group was excluded in the post-operative
months 20 to 25, the per cent of sick leave was reduced from 41 to 25 in the
cadaveric donor series and from 44 to 37 in the living donor series. Thus,
if the patients with full pension were excluded it seems as if the degree of
vocational rehabilitation is better in the cadaveric series than in the living
donor series.

DISCUSSION

The limited availability of dialysis facilities, the hidden mortality in chronic
uraemia (Ahlmén et al., 1972) and the economic aspects of regular dialysis
(Docherty, 1971) have indicated that the ultimate choice for treatment of
chronic uraemia is transplantation. The figures of rehabilitation for chronic
dialysis are encouraging, especially for home dialysis.

A number of factors influence the medical and vocational rehabilitation
of transplanted patients. Such factors are, for example, age distribution of
the material, patient selection, kidney donor source and steroid dosage. The
present material describes what was achieved by the kidney transplantation
programme in Gothenburg in the first 150 consecutive kidney transplant re-
cipients.

The superiority of living donor grafts as regards the medical and voca-
tional rehabilitation is shown by the present study. This refers particularly
to the early periods after transplantation. After the first seven post opera-
tive months the rehabilitation of the vast majority of the recipients of cadaver
kidneys as well as living donor ones, is good.

CONCLUSIONS

Renal transplantation was followed by a high degree of medical and vocational
rehabilitation in the majority of surviving recipients. Recipients of living
donor primary grafts were better rehabilitated than recipients of cadaveric
primary grafts.

ACKNOWLEDGMENTS

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REFERENCES

Scandinavian Journal of Urology and Nephrology, 6, in press
Cameron, J. S., Ellis, F. G., Ogg, C. S., Bewick, M., Boulton-Jones,
Pitman Medical, London
Docherty, P. (1971) Svenska Läkartidningen, 68, 4757
Murray, J. E., Barnes, B. A. and Atkinson, J. (1967) Transplantation,
5, 752
Parsons, F. M., Brunner, F. P., Gurland, H. J. and Harlen, H. (1971)
Volume 8, Page 3. Pitman Medical, London