Web extra material

How are kidneys allocated for transplantation in the UK?

The way in which deceased donor kidneys are allocated in the UK changed in 2006.\(^1\) They are allocated via the National Health Service Blood and Transplant (NHSBT) organ allocation scheme. Adults are allocated kidneys via a points scheme which is determined by blood group, waiting time, immunological factors [HLA match with extra points for DR and B homozygosity], age [both of patient and difference between the donor and recipient] and location of organ with respect to recipient (in order to minimise cold ischaemic time). This system reduced the proportion of patients waiting \(\geq 5\)-years for a kidney transplant from 16% in 2006 to 8% in 2009.\(^2\) Implementation of the new allocation scheme resulted in a decrease in the proportion of young adults (18-40 years) on the waiting list from 26% to 19%, better donor-recipient age matching, and a reduction in cold ischaemic time by 1 hr with no detrimental effect on 1-year death censored graft survival and patient survival (93% and 97% respectively).\(^3\)

Contraindications and special considerations for transplantation

There is still controversy about whether the life expectancy of patients over the age of 65 is increased following transplantation, however quality of life may be improved. Cardiac disease is a major cause of death post transplantation. In view of this, transplant candidates often undergo coronary assessment prior to surgery. The use of invasive versus non-invasive screening for this purpose varies between different transplant centres. A patient with a history of successfully treated malignancy may undergo transplantation, however it is important to estimate the risk of cancer relapse before placement on the transplant waiting list. A period of surveillance is required following treatment in order to detect possible recurrence. 53% of recurrences occur in patients transplanted \(<2\) years following completion of cancer therapy, falling to 34% if the interval between treatment and transplantation is 2-5 years and 13% if the interval is more than 5 years.\(^4\) This period of surveillance varies between \(>2\) and 5 years depending on the type of cancer.\(^5\) Liaison with an oncologist is advised.

Patients with HIV infection well controlled on Highly Active Antiretroviral Therapy (HAART) can undergo transplantation. A significant survival benefit is seen in such patients compared with those who remain on dialysis. Patients with hepatitis B and C infection can also be considered for transplantation depending on the presence of active viral infection and whether there is established cirrhosis. Input from a hepatologist should be sought in these patients prior to decisions regarding transplantation (table). Finally, obese patients are not
precluded from transplantation, however patients with a BMI >30 have inferior patient and allograft survival than non-obese counterparts and if possible methods of weight reduction prior to transplant should be sought. Many kidney transplantation centres in the UK will exclude patients with a BMI >35.

<table>
<thead>
<tr>
<th>Agent</th>
<th>Mechanism of action</th>
<th>Adverse effects</th>
</tr>
</thead>
<tbody>
<tr>
<td>Corticosteroids</td>
<td>Inhibit cytokine production</td>
<td>Diabetes, osteoporosis, weight gain, hypertension</td>
</tr>
<tr>
<td>Ciclosporin</td>
<td>Calcineurin inhibitor</td>
<td>Hirsuitism, gum hypertrophy, hypertension, diabetes, nephrotoxicity</td>
</tr>
<tr>
<td>Tacrolimus</td>
<td>Calcineurin inhibitor</td>
<td>Diabetes, nephrotoxicity, neurotoxicity (tremor)</td>
</tr>
<tr>
<td>Mycophenolate mofetil</td>
<td>Inosine monophosphate dehydrogenase inhibitor</td>
<td>Gastrointestinal disturbance (diarrhoea), haematological (anaemia, leucopenia), mouth ulcers</td>
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<tr>
<td>Azathioprine</td>
<td>Purine synthesis inhibitor</td>
<td>Myelosuppression, hepatitis</td>
</tr>
<tr>
<td>Sirolimus</td>
<td>Mammalian target of rapamycin (mTOR) inhibitor</td>
<td>Peripheral oedema, poor wound healing, hypertriglyceridaemia, anaemia, proteinuria</td>
</tr>
</tbody>
</table>

**Immunosuppressant agents and adverse effects**

**Ethical issues in renal transplantation**

**Organ allocation**

The UK has an opt-in system for organ donation, with people wishing to donate their organs after death registering with the NHS Organ Donor Register (ODR). In a health-care setting an individual can inform health professionals of their wish to donate their organs if they have not previously done so. The 2004 Human Tissue Act sets out a legal framework for the storage and use of tissue and organs from a living person and the use of tissue and organs from someone who has died. The Human Tissue Authority (HTA) is the independent body, which regulates the removal, storage, use and disposal of human tissue. Other allocation schemes include opt-out system and mandated choice.

An opt-out system is one where individuals are considered to be willing to donate unless they opt out by joining a national register, thereby moving the position to a presumed willingness to donate. There are two types of opt-out: In ‘hard’ systems the family’s wishes are not considered when deciding whether or not to donate. In the ‘soft’ policy, families can retain their veto.

Mandated choice requires competent individuals to decide whether they wish to donate their organs after their deaths. They are free to choose whether to donate, and even which
organs they chose to donate; however they must register their wishes. Individuals can also choose to let their relatives have the final say.

**Paid donation and organ trafficking**

Selling a human organ in the UK is forbidden. WHO estimated that 10% of all global kidney transplants in 2004 were in patients from developed countries who have travelled to economically challenged nations to buy organs. Vulnerable, poor donors are reported paid $1000, with recipients paying up to $100,000 for a kidney. The Declaration of Istanbul on Organ Trafficking and Transplant Tourism (2008) states that all forms of transplant commercialism, which target the vulnerable, should be prohibited, including transplant tourism and organ trafficking.

**References**