

RISK FACTORS

Native renal cysts linked to RCC in transplanted kidneys

Kidney transplant recipients are at increased risk of developing renal cell carcinoma (RCC) compared with the general population. Some of this risk has been attributed to the use of immunosuppressants and acquired cystic kidney disease. New research indicates that the presence of native renal cysts (NRCs) is a risk factor for developing RCC in a transplanted kidney.

To investigate the link between NRCs and RCC, Angeline Goh and colleagues performed a retrospective study of data from 1,036 kidney transplant recipients followed up between 1995 and 2007. All patients underwent routine abdominal ultrasonography within 1 month of transplantation (or at the first opportunity if transplanted prior to 1995) and then every 5 years, or every 2 years if they presented with one or more NRCs. The presence or absence of an NRC, timing of NRC onset relative to transplantation, duration of pretransplantation dialysis, and follow-up interval after transplantation were examined. Patients were divided into four groups based on the presence and timing of an NRC occurring (no NRCs, new NRCs, pre-existing NRCs, and time-indeterminate NRCs).

The incidence of RCC in the study population was 0.97% (10 of 1,036). Renal transplant recipients with an NRC had a 1.72-fold increased risk of developing RCC compared with those without NRC. Development of cysts could result from the uremic environment, a hypothesis supported by the occurrence of NRCs being independently associated with dialysis duration (odds ratio 1.2). “In contrast to earlier studies, we found that NRC development continues post-transplantation, likely due to the persistent downstream effects of activated proto-oncogenes”, comments Goh. The authors propose a ‘double-hit hypothesis’, where the initial stimulus for NRC development stems from a period of uremia, and, despite reversal of uremia after transplantation, use of immunosuppressants promotes the expression of growth factors and interferes with DNA repair mechanisms, triggering pre-existing NRCs to develop into RCC. “Whether the use of potent immunosuppressants, such as polyclonal antibodies, increases the risk of RCC by decreasing systemic immunologic surveillance, or whether mTOR inhibitors ameliorate cyst and RCC formation



Renal cell carcinoma. Image courtesy of Lee Fang Jann, Singapore General Hospital, Singapore.

through their antiproliferative effects, would also be of interest,” says Goh.

No current guidelines stipulate the frequency of ultrasonography screening following kidney transplantation. “Ultrasonography screening for NRC and RCC is effective in diagnosing these lesions early, and can be implemented with ease in a large prevalent [renal transplant recipient] population,” write the authors. They suggest that patients with end-stage renal disease who are waiting for a transplant should be monitored for NRCs to ensure early detection of RCC, and that transplant recipients with NRCs are screened regularly for RCC.

Helene Myrvang

Original article Goh, A. & Vathsala, A. Native renal cysts and dialysis duration are risk factors for renal cell carcinoma in renal transplant recipients. *Am. J. Transplant.* 11, 86-92 (2011)