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Short Communication

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Cancer in Kidney Transplant Recipients: Latest Findings

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Introduction

Acute renal failure in cancer patients may be due to the existence of tumor cell lysis, in which large amounts of potassium, phosphate, and nucleic acids are released into the bloodstream and cause a cancerous emergency [1]. In addition, it causes metabolic abnormalities that lead to the formation of calcium phosphate, which precipitates into the tissues and some into the kidneys. Metabolic abnormalities increase levels of uric acid, which precipitates in the kidneys. Both situations can lead to End-Stage Renal Failure (ESRF) [2]. The medical solution at this stage is for patients on dialysis or solid organ kidney transplantation.

The human body is a complex machine, and the healthcare industry still doesn't fully understand this complex machine. All kidney transplants follow a medical procedure called kidney transplantation, in which tissues and bones are transplanted from genetically different people. The blood types between the donor and the recipient don't have to match exactly, but they do have to be compatible. After surgery, the recipient is given a strong immunosuppressant drug to increase the likelihood that the recipient will accept the new organ. However, studies indicate an increased risk of cancer due to immunosuppression. For example, Renal Cell Carcinoma (RCC) accounts for 80-90% of all kidney cancers. Overall, Kidney Transplant Recipients (KTRs) have two to four times higher cancer risk than the general population.

Patients may be evaluated for a kidney transplant prior to initiating dialysis therapy. Most patients are at risk for years on a waiting list for a kidney transplant, whether the solid organ comes from a living donor or a deceased donor. In this article, the issues covered are specific to kidney transplantation, as there are three. First, the RCC in the donor kidney. Second, CCR in kidney transplant candidates. Third, screen for RCC after transplantation.

First, the RCC in the donor kidney. Based on available studies, five-year post-transplant patients had a survival rate of 92%. For live tissue implanted immediately, this had a survival rate of 96%. A full review of medical records in June 2017 identified renal transplant recipients after ex vivo resection of small tumors, 81% being RCC tumors, out of a total of 109 “restored” kidneys. Because demand outstrips supply, most organ transplant programs limit the number of kidneys that can be "restored" to patients over 60 years of age or who have problems with dialysis (and informed consent of recipients). Readers may wonder if RCC has recurred, and an Australian study reported less than 2% of RCCs after an average of 7 years of follow-up, strongly arguing for a low cancer risk [3].

Second, CCR in kidney transplant candidates. According to the source cited, there are two main reasons why a beneficiary assessment excludes cancer:

- To avoid worsening of the prognosis of any immunocompromised cancer
- Avoid transplantation in patients with a short life expectancy because donor organs are extremely rare

Therefore, a period of 3 years or more is needed to prevent any recurrence of the cancer. This filter applies to recipients who are on dialysis, have a family history of kidney cancer, acquired cystic disease, or palliative kidney disease. This 3-year observational period was questioned because a Norwegian study found no association between the observation periods and all-cause (or cancer-specific) mortality. Here are the conclusions of the Norwegian study. Of the 100 kidney transplant recipients with pre-transplant RCC, only 13 died from recurrent post-transplant RCC. However, none of the 13 patients had a short follow-up (less than 2 years). In fact, 7 out of 13 had an observation period longer than five years. This evidence is supported by a study in France involving 143 kidney transplant recipients with a history of RCC and finding recurrence in 13 patients at an average of 3 years after transplantation, without any association with the observation period.

Third, screen for RCC after transplantation. To date, no clinical trials of cancer screening in kidney transplant recipients have demonstrated improved survival. Several studies from 2000 to 2020 found inconsistencies in guidelines recommending that post-operative organ transplant recipients know how to screen for RCC. In addition, there are no specific guidelines for the evaluation or treatment of kidney transplant tumors or RCC in kidney transplant recipients. A systemic review of solid mass on renal radiographs revealed 175 tumors reported in 163 patients, mainly clear cell RCC (46%) and papillary RCC (42%). In these situations, the majority are treated with some type of nephrectomy (87%). The results showed that the cancer recurrence rate was similar to that of patients without a transplant.

Renal Cell Carcinoma (RCC) is not the only cancer affecting kidney transplant recipients. In fact, the most common cancer in recipients 20 years after transplantation is Post-Transplant Lymphoproliferative Disorder (PTLD). The physicians cite these findings as explaining that immunosuppressive drugs facilitate cancer through various mechanisms, such as reduced immune surveillance or cellular atypical, mechanisms, impaired cell repair and proliferation of cancer-causing viruses. The doctors concluded that long-term exposure of kidney transplant recipients to such immunosuppression requires a personalized approach to cancer prevention, screening and surveillance.

The details of the study are as follows: 293 kidney transplant recipients were analyzed with radiographic survival greater than 20 years. The cancer rate in those affected 20 years after transplantation is 15%; those with 30 years post-implantation was 33%. Specifically for non-melanoma skin cancer, the 20-year and 30-year percentages were 33% and 77%, respectively [4].

In conclusion, dying from cancer is a painful reality for kidney transplant patients. Undoubtedly, cancer is the main cause of illness in kidney transplant recipients. A 2014 study in Australia focused on what happens at the cellular level. Their findings support this explanation: In organ transplantation, anti-tumor surveillance is impaired by the inhibitory effect of immunosuppressants on dendritic cell activity, spines, antigen-presenting cells essential for the initiation and regulation of innate and adaptive immune responses against foreign antigens. The conclusion was simple: more research needs to be done at the cellular level. Another 2019 study, 110 topics, focusing on the relationship between immunosuppressants and cancer in kidney transplant recipients found that posttransplant immunosuppressive dose adjustment was not associated with statistically with mortality risk [5].

Conflict of Interest

The author declare no competing financial interest.

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No.

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