



## Old Male Living Renal Transplant Recipients More Likely to Be at Risk for Colorectal Cancer

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### ABSTRACT

**Background.** The development of posttransplant malignancy is a well-recognized complication of kidney transplantation due to immunosuppressive therapy. The literature on colorectal malignancy in living renal transplant recipients are limited; most of the data have been collected from deceased donor cases. As living kidney donation is now growing, we sought to define the characteristics and pattern of gastrointestinal malignancy among this group.

**Methods.** This cross-sectional, multicenter study analyzed the incidence and characteristics of colorectal malignancy among 17 patients with gastrointestinal malignancy after living donor renal transplantation between 1985 and 2009 in Iran. We observed a new-onset, biopsy-proven colorectal malignancy in eight patients of mean age  $49.6 \pm 10.3$  years (range = 27–60) at transplantation time and a mean age of  $61.1 \pm 8.6$  years (range = 53.4–78.6) at cancer diagnosis.

**Results.** The cumulative incidence rate of colorectal malignancy of 0.03% was restricted to the male gender (100%), all of whom had functioning grafts. The mean period from transplantation to diagnosis was  $99.7 \pm 10.4$  months (range = 5–284). The majority of the recipients were aged more than 50 years ( $n = 5$ ) and the most frequent immunosuppressive drug was azathioprine ( $n = 5$ ); none had received antithymocyte globulin/antilymphocyte globulin. It was mostly a late-onset malignancy with 50% of recipients presenting beyond 5 years from transplantation. They were followed for a mean of  $9.2 \pm 2.4$  (range = 6–12) months after cancer diagnosis with three patients having succumbed within 9 months.

**Conclusion.** Due to the long latency after transplantation and the poor outcomes of colorectal malignancy these patients require long-term screening tests for early detection and due to their poor outcomes a new therapeutic approach.

**T**HE DEVELOPMENT OF POSTTRANSPLANT malignancy is a well-recognized complication of kidney transplantation due to immunosuppressive therapy.<sup>1,2</sup> The literature on colorectal malignancy in living renal transplant recipients is limited since most data have been collected from patients who received deceased donor kidneys.<sup>3</sup> The incidence of any neoplasm in this setting ranges from 2% to 31%.<sup>4</sup> As living kidney donation is growing, we sought to define the characteristics and pattern of malignancy among this group of recipients.

Colorectal cancer is one of the most common malignancies among the general population.<sup>2</sup> Although a number of studies have reported a low incidence of colorectal carcinoma in the transplant population,<sup>2,5</sup> Arichi et al in 2008

reported colorectal cancer to be common in this setting.<sup>6</sup> Considering this controversy, we sought to examine colorectal tumor characteristics among Iranian subjects.

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**Table 1. Gastrointestinal Cancer Incidence**

Cancer	Male		Female		Age			Total
	<i>n</i>	(%)	<i>n</i>	(%)	≤30 y	31–50 y	>50 y	
Colorectal	8	47			1 (3)	2 (1.7)	5	17
Gastric	2	11	2	2.4		2 (1.7)	2	
Pancreace	1	5.5				1 (0.9)		
Hepatoma	3	17				3 (2.6)		
Esoghagus	1	5.5					1 (1)	

## METHODS

This cross-sectional, multicenter study examined the incidence and characteristics of eight colorectal malignancies among living renal transplant recipients between 1985 and 2009 in Iran. These new-onset, biopsy-proven colorectal malignancies occurred in subjects with a mean age of  $49.6 \pm 10.3$  years (range = 27–60) at transplantation time and mean age of  $61.1 \pm 8.6$  years (range = 53.4–78.6) at cancer diagnosis.

### Immunosuppression Protocols

The immunosuppressive therapy was based on cyclosporine or sirolimus, mycophenolate mofetil (MMF) or azathioprine and steroids. Before 2000, patients received maintenance immunosuppression with prednisone and azathioprine or cyclosporine, prednisone, and azathioprine. After 2000, the majority of patients received cyclosporine, prednisone, and MMF.

### Statistics

Data were analyzed using SPSS version 17.0 with continuous variables expressed as mean values  $\pm$  standard deviations, whereas categorical variables, as numbers and percentages.

## RESULTS

Among 17 subjects with a gastrointestinal malignancy, the most frequent one was colorectal cancer. With a cumulative incidence rate of 0.03%. These cases were detected only among male patients, all of whom had functioning grafts. The mean period from transplantation to diagnosis was  $99.7 \pm 10.4$  months (range = 5–284). The majority of affected subjects were aged more than 50 years ( $n = 5$ ); the most frequent immunosuppressive drug was azathioprine ( $n = 5$ ). None of them had received antithymocyte globulin/antilymphocyte globulin. It was almost a late-onset malignancy with 50% presenting beyond 5 years from transplantation. They had been followed for a mean of  $9.2 \pm 2.4$  months (range = 6–12) after cancer diagnosis. Three patients died within 9 months. Gastrointestinal cancer incidence based on age and sex distribution is shown in Table 1.

## DISCUSSION

The third most common cause of cancer death in the world is colorectal cancer.<sup>7,8</sup> Its incidence and age distribution vary widely in various parts of the world. In Iran's general population the colorectal cancer incidence is between 7 and 8/100,000 in both men and women, which is similar to other Middle-Eastern countries and much lower than seen in Western countries. Age distribution of colorectal cancer is similar to that seen in Western countries.<sup>7</sup> In this study, we have reported colorectal cancer incidence among Iranian recipients. We detected a low prevalence and late onset of presentation for this cancer, which may result from the living donations, the high-fiber diet, the lifestyle, the ethnic background, and/or the disease epidemiology. In contrast to Vegso et al<sup>2</sup> (M/F: 2/4) and in agreement with Arichi et al<sup>6</sup> (M/F: 4/0), we noted colorectal cancer to present only among male patients. The long latency after transplantation and the poor outcomes for colorectal malignancy necessitate long-term screening tests for early detection and newer therapeutic approaches to improve outcomes.

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