

Feasibility of Colonoscopy and Its Findings in Patients after Kidney Transplantation

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ABSTRACT

Background:

Many studies have clearly reported the advantages of colonoscopy screening in terms of reducing the mortality rate of colorectal cancers in general population. However, the importance of colonoscopy screening in improving the survival rate of kidney transplant recipients is still unclear. So, the aim of this study is to survey the importance and feasibility of colonoscopy screening in kidney transplant recipients.

Materials and Methods:

This clinical study was conducted from February 2015 to November 2016. All participants received polyethylene glycoelectrolyte solution (PEG-ES) or magnesium hydroxide for bowel preparation. Colonoscopy was done and the location and the size of any lesions were recorded in all participants.

Results:

Among 247 post-kidney transplant patients who were visited routinely in Labbafi-Nejad Hospital in Tehran, 30 individuals with any signs or symptoms of malignant or non-malignant colorectal diseases and patients who had a colonoscopy during the previous year or had a failed transplant procedure and subsequent return to dialysis were excluded. Finally, 217 kidney transplant recipients were enrolled in this study, of which 121 patients completed the study.

Conclusion:

The results of this study, for the first time, confirm the safety and efficiency of colonoscopy as a routine gastrointestinal screening method among post-kidney transplant recipients in Iran, and suggest that it can be highly proficient in detecting gastrointestinal lesions and its implementation is without significant adverse effects in such patients.

Keywords: Colonoscopy, Kidney transplant recipients, Colorectal cancer

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INTRODUCTION

Kidney transplantation has several advantages compared with continuing dialysis for patients with end-stage renal disease (ESRD) (1,2). However, the risk of developing a new neoplasm in post-kidney transplant recipients is 3 to 5 times higher than the general population (3). Non-melanoma skin cancers, kidney malignancies, cancers associated with viral infections, and lymphoproliferative disorders are the majority of these malignancies (4-6).

The risk of solid tumors such as colorectal and lung

cancers in kidney transplant recipients is 2 to 3 times higher than the general population due to chronic use of immunosuppressants (7-9), hence cancer screening is recommended for transplant recipients for a better health care management according to post-transplant malignancy (PTM) guidelines (10,11). Many studies have clearly reported the advantages of colonoscopy screening in terms of reducing the mortality rate of colorectal cancer in general population (12-16). However, the importance and feasibility of colonoscopy screening in improving the survival rate of kidney transplant recipients is still unclear.

The aim of this study was to survey the importance and feasibility of colonoscopy screening in kidney transplant recipients. Hopefully, the results of this study contribute to fill this gap in this issue.

MATERIALS AND METHODS

Patients and data collection:

Kidney recipients above 35 years old were recalled to participate in this study. The patients in this study were chosen from kidney recipients who were referred to LabbafiNejad Nephrology Clinic for follow-up from February 2015 to November 2016. During the study period, all of them were asked to fill an informed consent form.

In this study, we included participants who had undergone kidney transplantation at least five years ago. In addition, all patients included in this study have been treated with immunosuppressive agents including mycophenolic acid-azathioprine-prednisone (2.9%) or cyclosporine-mycophenolic acid-prednisone (82.6%) or mycophenolic acid-tacrolimus-prednisone (14.5 %), at the time of study for at least five years.

Patients with any signs or symptoms of malignant or non-malignant colorectal diseases such as any form of bleeding as well as patients with previously diagnosed colorectal cancer, advanced dysplastic adenoma, chronic inflammatory bowel disease, unstable cardiopulmonary disease, autosomal dominant polycystic kidney disease (ADPKD), and candidates for hereditary gastrointestinal (GI) cancer syndrome were excluded. In addition patients who had a colonoscopy during the previous year or had a failed transplant procedure and subsequent return to dialysis were excluded as well.

Among 247 post-kidney transplant patients who were visited routinely in Labbafi-Nejad Hospital in Tehran, 30 individuals were excluded based on the above-mentioned criteria. Finally, 217 eligible participants were enrolled in this study according to the inclusion and exclusion criteria. 121 patients entered colonoscopy screening program and completed the study course. Complete colonoscopy of the cecum was done for all the patients.

Colonoscopy:

Colonoscopy was performed at endoscopic center in Taleghani Hospital affiliated to Shahid Beheshti University of Medical Sciences by gastroenterologists who work in this center. Each patient was screened once by colonoscopy in this study. No follow-up was considered during the study. Biopsy samples were taken from all abnormal findings. All participants received polyethylene glycol-electrolyte solution (PEG-ES) or magnesium hydroxide, according to physicians' preferences for bowel preparation. In some cases, intravenous (IV) therapy was performed before colonoscopy and sodium phosphate were not used at all.

Advanced adenomas were defined as having more than 10 mm in diameter or have more than 25% villous or tubulovillous components or high grade dysplasia. In patients with multiple suspicious lesions, the most advanced lesion was considered. The location and the size of any lesion including erosions, ulcers, inflammations, polyps, and tumors were recorded. Location of lesions within the colon was defined as either in right (caecum, ascending, or transverse colon) or left colon (descending, sigmoid colon, or rectum). The size of polyps was estimated by forceps biopsy.

RESULT

Among the 121 patients for whom colonoscopies were performed, 62% were under 50 years old and 38% were above 50 years old. The prevalence of polypoid lesions was 17.3%, similar to the general population.

Regarding the lesions types, 7 patients (5.8%) had a hyperplastic polyp, 21 (17.32%) had adenomatous polyp including tubular (13 patients), villus (5 patients), and tubulo-villus (3 patients), and one

Table 1: Characteristics of the study population

Age (years) mean	57.9
Sex, male/female, N (%)	52 (48%) / 64 (52%)
Polyps, n/n total (%)	21/121 (17.3%)
Advanced adenomas, n/n total (%)	1/121 (0.8%)
Polyps > 1 cm, n/n total (%)	8/121 (6.6%)

patient had an advanced adenoma. In addition, there was a significant association between the duration of immunosuppressive therapy and the presence of tubular adenoma polyp in patients ($p < 0.05$).

Table 1 shows the histopathological characteristics and demographic details of these participants.

DISCUSSION

Several studies have reported a direct relationship of the long-term interval between transplant surgery and colonoscopic evaluation with the incidence of advanced colorectal neoplasia due to the long use of immunosuppressive agents. For example, Saidi and colleagues (17) reported this interval to be about 11 years. In another study, this interval was estimated to be about 12 ± 9 years (18). In our study, we included participants who had undergone kidney transplantation at least 5 years earlier.

According to the most of the recent studies, colonoscopy is the gold standard screening tool for colorectal cancers (CRCs). Also, some studies have shown that colonoscopy can reduce the mortality of CRCs about 66% in general population (12). However, this procedure is invasive and expensive. Besides, due to delayed wound healing in kidney recipients, biopsy or removal process which is routinely done by colonoscopy as a follow-up tool is not recommended (19). The most important point of this study was the use of systemic colonoscopy. This method helped us to detect different sizes and types of colorectal polyps with more accuracy than other screening tests.

It has been reported that the risk of CRC in kidney recipients increases in younger ages than the general population. In this regard, Wong and colleagues estimated the risk of CRC in 35 years old post-kidney recipient population was equivalent to 55 years old normal individuals in the general population. Therefore, we included patients older than 35 years in our study (7).

The ratio of the polypoid lesions in kidney recipient population in comparison with the general population were evaluated in some studies, by which conflicting results were obtained. Wang and colleagues reported that the mortality rate in kidney recipients was greater than the general population. Penn database of Cincinnati tumor registry and Parikshak and co-workers reported 386 CRC cases in 10667 organ recipients, which is similar to the general population (17,20). Our results indicate that the prevalence of polypoid lesions in patients with transplanted kidney was 17.3%, which is relatively consistent with the prevalence of these lesions in the general population (20,21). Among these lesions, adenomatous polyps were more common than other polyps, suggesting an increased risk of adenocarcinoma in these patients (22,23).

An increased rate of malignancy after transplantation due to old age and prolonged immunosuppressive therapy has been reported. This issue is known as the third cause of mortality among these patients in the USA, Spain, and Australia and plays a key role in CRC (24-27). Development of lesions from adenoma to carcinoma can take between 5 and 10 years depending on many factors such as size, histopathology, and patient's age (28,29). Therefore, it seems essential to assess the prevalence of polyp after transplantation.

Dobies and colleagues (2016) analyzed the gastrointestinal findings of occult blood test and endoscopy in kidney transplant recipients and showed a similar polyp rate in this group compared to the general population. In this study, the prevalence of CRC was estimated to be 4.4%, indicating that kidney transplant recipients have an increased risk of GI cancer. Consistent with our results, they also noted that diagnostic colonoscopy was more valuable than other conventional screening methods (26). The higher prevalence of GI malignancies in patients with chronic kidney disease has also been shown elsewhere (30).

Furthermore, Kim and co-workers evaluated the treatment outcome of CRC cases in kidney transplant recipients and found that patients with advanced CRC had an overall favorable prognosis less than that for the normal population. Although the treatment results for the early stage of CRC was the same for both groups, they emphasized the necessity of routine

colorectal screening in kidney transplant recipients (31). Several studies have shown that CRC in kidney transplant recipients is considered more aggressive than that in the general population (32-34). Therefore, it is better to initiate screening as soon as possible to lower the potentially harmful side effects.

Although our study demonstrated the need for an efficient screening program, more comprehensive studies are required to determine the precise age and postoperative period cutoffs for beginning the preventive screening program. However, it is established that considering the higher risk of neoplasia development in these patients, to have a better prognosis, the age of beginning the screening program should desirably be lower than the general population (35). Overall, the slow progression of CRC provides a good opportunity for early detection by colonoscopy screening programs in order to enhance the survival rate of kidney transplant recipients.

CONCLUSION

The results of this study, for the first time, confirm the safety and efficiency of colonoscopy as a routine gastrointestinal screening method among kidney transplant recipients in Iran, and suggest that it can be highly proficient in detecting GI lesions and its implementation is without significant adverse effects in these patients. Also the prevalence of each type and sizes of colorectal polyps have been estimated in kidney recipient population in a case control study. However, this study lacked sufficient statistical power to identify the risk factors of neoplasia in these patients due to limited number of advanced colorectal neoplasm cases. More prospective studies in larger scales are needed to investigate the relationship between transplant-related factors such as immunosuppressive drugs and colorectal neoplasia.

CONFLICT OF INTEREST

The authors declare no conflict of interests related to this work.

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