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ORIGINAL ARTICLE

Depressive symptoms and associated factors among renal-transplant recipients in China

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ABSTRACT

Aim: This study aimed to explore depressive symptoms and associated factors among renal-transplant (RT) recipients in China.
Methods: This study included 287 RT recipients. Data were collected from August to November 2014 by utilizing demographic forms, namely, the Self-rating Depression Scale and the Multidimensional Scale of Perceived Social Support. Descriptive statistics, Student's *t* test, Chi-square test, ANOVA, and multiple linear regression were used for data analysis.
Results: More than half of the recipients presented depressive symptoms. All recipients in the four transplant period groups (≤5 yr, 5–10 yr, 10–15 yr, and >15 yr) reported greater depressive symptoms than the Norm. No significant difference was observed in the depressive symptoms in the four transplant period groups. Multiple linear regression indicated that depressive symptoms were significantly associated with employment status, economic burden, inhabitation area, and social support.
Conclusion: Depression is common among RT recipients in China. Employment status, economic burden, inhabitation area, and social support are the main factors affecting depression among RT recipients. Follow-up clinics should prescribe the evaluation of depression as a routine examination for RT patients. Moreover, depressed recipients must be provided with individualized care by collecting information on the depressive symptoms, employment status, economic burden, inhabitation area, and perceived social support of recipients.

1. Introduction

Renal transplantation (RT) is considered the most effective renal replacement therapy for patients suffering from end-stage renal disease (ESRD) and chronic renal failure (CRF) [1]. More than 100,000 cases of RTs have been performed in China since Wu Jieping performed the first operation in 1960 [2]. Previous studies have proven that RT effectively improves the quality of life (QOL) and survival rate of ESRD and CRF patients [3,4]. However, patients who have undergone RT have presented high rates of psychological disorders after the operation [5], of which depression is one of the most apparent [6]. Depressive symptoms increase the risk of non-adherence of patients to medication and have been linked with abnormal renal function, poor QOL, and low employment rate after RT [7,8]. Therefore, depression among RT recipients and its associated factors should be investigated to develop routine screenings and individualized interventions of RT recipients manifesting depressive symptoms.

Such an investigation is particularly important in China because of the high incidence (ranging from 43.2% to 50.3%) of depressive symptoms among RT recipients [9,10]. Depressive symptoms among RT recipients have been reported in Canada [11], Panama [12], Iran [6], and Taiwan [13]. A study conducted in Belgium reported that 17.4% of adolescent RT recipients displayed depressive symptoms [14]. The prevalence of depression among cadaveric RT recipients (40.9%) differed considerably from that among living RT recipients (59.5%) [10].

Although several studies have analyzed depression by comparing RT recipients with dialysis patients, chronic kidney disease patients, or the general population, no conclusive finding has been established as to whether RT recipients manifest less severe depressive symptoms than other patients. A number of recipients have reportedly mitigated depression when compared to

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waitlisted patients on maintenance dialysis [11,15]. However, Karaminia found no significant difference in the level of depression of RT recipients and hemodialysis patients [16]. In the literature, the emotional distress of patients suffering from chronic kidney disease was compared with that after transplantation, and the results showed that the emotional distress of RT recipients were improved [17].

Pascazio used the Beck Depression Inventory (BDI) scales to compare the depression manifested by RT recipients to that by healthy people, and no significant difference was observed; however, the Affective Neuroscience Personality Scale revealed that RT recipients had a significantly lower score than healthy people in terms of general negative emotions [5]. Tang and Zhu found that in China, RT recipients were significantly more depressed than the general population [9,10].

Depressive symptoms among RT recipients are reportedly associated with several factors. Many studies have found that RT recipients who have low family income or who paid for their own operation had higher tendencies of being depressed than those who have high family income or whose operation was paid for by public service or medical insurance [9,18]. Social support also affects the depressive symptoms of recipients. RT recipients who receive limited or negative social support are more prone to depressive symptoms [9,12,19]. Other factors associated with depressive symptoms include history of anxiety, old age, low educational attainment, donor type, and marital status [11,12,20]. RT recipients who had experienced comorbidities, complications, rejection, long pre-transplant dialysis periods, and long post-transplant periods reported high severity of depression [6,11,18]. By contrast, high self-efficacy, self-care behavior, and positive coping mechanisms are negatively associated with depressive symptoms among RT recipients [9,13,19].

Although a number of studies have reported the prevalence and severity of depressive symptoms among RT recipients in various geographical regions, few such studies have been conducted in China [2]. Moreover, the majority of these studies considered small samples. Two studies assessed depressive symptoms at 1 week or at $\leq$3 month after transplantation [10,21]; therefore, their results may not reflect the depression experienced by RT recipients in a long post-transplant period. The present study was investigated depressive symptoms among RT recipients in China and the associated factors to develop appropriate protocols for screening RT recipients manifesting depressive symptoms and improve their mental health by applying individualized intervention.

2. Materials and methods

2.1. Participants

We conducted this cross-sectional study in a general hospital in Beijing from August to November 2014. We recruited 287 RT recipients (58.2% male, mean age: 47.49 yr) who had visited transplant follow-up clinics to participate in this study. The inclusion criteria were as follows: has received a renal transplant at least three months ago; has a functioning graft during the investigation; is more than 18 years old; and can speak and read Chinese. Recipients who underwent multiple-organ transplant or more than one renal transplant procedure were excluded.

2.2. Measurement

We collected socio-demographic information, including age, gender, employment status, educational attainment, marital status, whether the transplant was self-paid or paid by public service or medical insurance, family income, economic burden, and perceived social support. We also collected transplant-specific information, including post-transplant period, type and duration of dialysis, donor type, and complications after transplantation. Depressive symptoms were assessed by using self-reported questionnaires.

2.2.1. Depression assessment

Depressive symptoms were assessed using the Self-rating Depression Scale (SDS), which was developed by Zung and was translated into Chinese and validated for use for the Chinese-speaking population [22,23]. The questionnaire contained 20 items, each describing a depression state. Ten of the items were worded symptomatically positive, and the other ten were worded symptomatically negative. Patients were asked to rate each item on the basis of how they felt at the time of testing, so that their depressive symptoms during the preceding week can be assessed. Patients chose among four ratings: a little of the time, some of the time, a good part of the time, or most of the time. In scoring the SDS, a value of 1, 2, 3, and 4 is assigned to each response depending on whether the item was worded positively (reverse scored) or negatively (forward scored). The sum of the values of all items denoted the raw score, which ranged from 20 to 80; a higher scores indicated a more severe depression. The SDS index, which was expressed as a decimal, was derived by dividing the raw scores by the maximum possible score (i.e., 80). In accordance with the guidelines for optimal cut-offs for the Chinese version of the SDS, an index score of $<$0.50 implied that the patient was symptom-free, whereas an index score of $\geq$0.50 indicated that the patient was symptomatic. Index scores between 0.50 and 0.59 indicated that the patient was having mild depression. Moderate depression is confirmed if the patient scored between 0.60 and 0.69. Patients having index scores $\geq$0.70 are considered severely depressed [24]. In our study, the Cronbach's α coefficient of the SDS was 0.804.

2.2.2. Perceived social support

We adopted the Multidimensional Scale of Perceived Social Support (MSPSS) to assess the perceived social support of RT recipients. The scale was developed by Zimet (1988) and was verified to have good internal reliability (Cronbach's α = 0.84–0.92) [25]. Huang et al. translated the MSPSS into Chinese and used factor analysis to examine the components of the MSPSS [26]. The MSPSS included 12 items, which were divided into three subscales according to the source of the support (i.e., family, friends, and significant other). Each subscale consisted of four items, and each item was rated on seven-point scale ranging from *very strongly disagree* to *very strongly agree* (range = 1–7). The average score of four items in each subscale denoted the subscale score, and the average score of all items was the total score; a higher score indicated that the patient perceived a greater social support. In this study, the Cronbach's α coefficient of the three subscales ranged from 0.797 to 0.870, and the Cronbach's α coefficient of the MSPSS was 0.917.

2.3. Ethical considerations

Both university and hospital ethics committees approved the methodology. We explained the purpose, risks, and benefits of this study to the recipients before they were asked to participate. Recipients were guaranteed that their participation was voluntarily and that their refusal would not affect their clinical care. All participants were requested to sign a written informed consent.

2.4. Data collection

Before conducting the survey, we trained all investigators to

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