ELSEVIER

Pain Affects Health-Related Quality of Life in Kidney Transplant Recipients

M.-H. Nourbala, M.-T. Hollisaaz, M. Nasiri, S. Bahaeloo-Horeh, M. Najafi, H. Araghizadeh, Y. Rezaie, and M. Lak

ABSTRACT

Background. Chronic pain is prevalent in end-stage renal disease patients undergoing chronic hemodialysis. We do not fully know the intensity of chronic pain experienced by kidney recipients in comparison to those on chronic hemodialysis and healthy controls. Moreover, the effect of chronic pain on kidney recipients' health-related quality of life (HRQoL) is yet to be comprehensively addressed. We designed this study to find an answer to these questions.

Methods. In this case control study, we studied 205 kidney recipients, 69 hemodialysis patients, and 100 healthy controls, who were matched for age, sex, monthly family income, and educational level. The patients were evaluated for the intensity of chronic pain by Visual Analogue Scale (VAS). HRQoL was measured with Short Form 36 (SF-36) in the kidney recipients. Chronic pain intensity was compared in the study groups, and in the kidney recipients the correlation between SF-36 subscores and severity of pain was assessed.

Results. Severity of pain in the kidney recipients was lower than the hemodialysis patients, but more than the healthy controls ($P = .001$). The VAS pain score negatively correlated with the scores of SF- 36 total ($r = -.329$, $P = 01$), mental health ($r = -.190$, $P = 07$), physical health ($r = -.275$, $P = .001$), physical function ($r = -.339$, $P = .001$), role limitation due to physical problems ($r = -.478$, $P = .001$), role limitation due to emotional problems ($r = -.326$, $P = .001$), and bodily pain ($r = -.894$, $P = .001$).

Discussion. The intensity of chronic pain experienced by the kidney recipients is less than that experienced by patients under chronic hemodialysis, but higher than healthy subjects. Focusing on chronic pain as a cause of post–renal transplantation morbidity is expected to improve post–renal transplantation quality of life.

PRE–RENAL TRANSPLANTATION end-stage renal disease (ESRD) patients suffer severe chronic pain by comparison with the general population,[1–3] and it has been established that chronic pain lingers long after transplantation.[4–8] What merits a rigorous investigation is whether or not renal transplantation will reduce chronic pain to the level perceived by the general population.[9,10]

The impact of chronic pain on health-related quality of life (HRQoL) as an important clinical outcome, albeit well known in various chronic illnesses[7,11] such as ESRD,[12] is yet to be thoroughly investigated in kidney recipients. This study sought to assess the association between chronic pain intensity and post–renal transplant HRQoL by evaluating chronic pain intensity in kidney recipients in comparison with chronic hemodialysis patients and healthy controls.

MATERIALS AND METHODS

This case control study, carried out in 2006 in Baqyiatallah Hospital, Tehran, Iran, recruited patients having undergone renal

From the Nephrology/Urology Research Center (NURC), Baqiyatallah Medical Sciences University (M.-H.N., M.-T.H., H.A.Z., M.L.), Tehran, Iran; Clinical Research Unit (M.N., S.B.-H., M.N.), Baqiyatallah Medical Sciences University, Tehran, Iran; and Trauma Research Center (Y.R.), Baqiyatallah Medical Sciences University, Tehran, Iran.

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Address reprint requests to Mohammad Hossein Nourbala, Baqiyatallah University of Medical Sciences, Vanak Square, Mollasadra Ave, 19945-587 Tehran, 1435915371 Iran. E-mail: noorbalam@gmail.com

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Table 1. Demographic and Clinical Data of the Study Groups

	Transplanted (n = 205)	Hemodialysis (n = 69)	Healthy Controls (n = 100)	P Value
Age (mean ± SD)	48.7 ± 13.6	52.0 ± 14.2	49.9 ± 10.8	NS*
Gender (male)	130 (63.4%)	44 (55.7%)	55 (55%)	NS†
Income level (more than 300,000 rials)	45 (22%)	16 (20.3%)	17 (17%)	NS†
Educational level (under high school diploma)	110 (53.7%)	49 (62.0%)	61 (61%)	NS†
ESRD etiology				.047†
Diabetes	20 (9.8%)	18 (22.8%)	—	
Hypertension	67 (32.7%)	30 (38.0%)	—	
Urological disease	6 (2.6%)	2 (2.5%)	—	
Congenital disease	16 (7.8%)	3 (3.8%)	—	
Glomerulonephritis	33 (16.1%)	10 (12.7%)	—	
Polycystitis	10 (4.9%)	5 (6.3%)	—	
Unknown	38 (18.5%)	6 (7.6%)	—	
Others	15 (7.3%)	5 (6.3%)	—	

ESRD, end-stage-renal-disease.
*ANOVA test.
†Chi-square test.

transplantation (group I, n = 205), patients undergoing chronic hemodialysis (group II, n = 69), and healthy controls (group III, n = 100). The three study groups were matched for age, sex, total family income, and educational level. The frequency of diabetes as a cause of ESRD was higher in group I than group II (P = .048). The inclusion criteria for all the groups were stable clinical conditions and absence of any acute phase of concomitant diseases or acute infections, as well as a history of at least 6 months on hemodialysis for group I and an overall elapsed time of at least 6 months posttransplantation and satisfactory state of kidney function for group II (creatinine ≤ 2).

HRQoL was assessed by Short Form 36 (SF-36). This questionnaire was specifically adapted for use in veterans receiving care in an ambulatory setting. SF-36 measures eight dimensions of health status including general and mental health, energy and vitality, physical and social functioning, role limitations due to physical and emotional problems, and bodily pain. These eight dimensions can be summarized numerically into the physical component summary and the mental component summary, with higher scores indicating better HRQoL. The scores are standardized to 100, with the worst score at 0 and the best at 100.[13] SF-36, widely used for post–renal transplantation HRQoL, was translated into Farsi; its internal consistency, was validated at .87 using Cronbach's alpha and its construct validity was acceptable.[14]

Chronic pain intensity was measured by Visual Analogue Scale (VAS), using a horizontal 10-cm line with the statements "no pain at all" on the extreme left-hand end and "the worst possible pain" or "unbearable" on the extreme right-hand end. VAS is scored by measuring the distance from the end of the scale indicating absence of pain (or no distress or no pain relief) to the place marked by the patient.[15] The kidney recipients were divided into three pain groups: no or mild pain (VAS < 3.3 mm, n = 99), moderate pain (VAS between 3.33 and 6.66, n = 34), and severe pain (VAS > 6.66, n = 31).

Statistical Analysis

Data were analyzed using SPSS for Windows 13.0. Description of the study variables was done by mean and standard deviation or frequency tables. Chronic pain intensity was compared in the three study groups by analysis of variance, the Pearson test was employed in the kidney recipients to assess the correlation between SF-36 subscores and VAS pain scores. $P < .05$ was considered statistically significant.

RESULTS

The demographic data of the three groups and clinical data of groups I and II are presented in Table 1. The mean VAS pain score in the kidney recipients was lower than that in the hemodialysis patients, but it was higher than that in the healthy controls (6.7 ± 2.7 vs 7.7 ± 2.6 vs 5.0 ± 3.3, P = .001, respectively). The VAS pain score negatively correlated with the scores of SF-36 total, mental health, physical health, physical function, role limitation due to physical problems, role limitation due to emotional problems, and bodily pain ($P < .05$). Correlation coefficients between VAS pain score and scores of HRQoL subdomains in the kidney recipients are shown in Table 2. Table 3 demonstrates a comparison between HRQoL subdomains in the kidney recipients and different levels of VAS pain scores.

DISCUSSION

Our study shows that while chronic pain intensity in kidney recipients is less than that experienced by hemodialysis

Table 2. Correlation Coefficients of Chronic Pain Intensity and SF-36 Subscores in Kidney Recipients

Scale	Correlation Coefficients	P Value
SF-36* total	−.329	.001
General mental health	−.199	.005
Physical health	−.275	.001
Physical function	−.339	.001
General health perception	.157	.027
Role limitation	−.478	.001
Social function	.020	.784
Role limitation due to emotional problems	−.326	.001
Mental health	−.190	.007
Bodily pain	−.894	.001

*Health-related quality of life, Short Form 36 (SF-36) questionnaire.

Table 3. Comparison Between SF-36 Subscales in Kidney Recipients With Different Degrees of Chronic Pain Intensity

	VAS* < 3.3 mm (*n* = 99)	VAS 3.33–6.66 (*n* = 34)	VAS > 6.66 (*n* = 31)	*P* Value*
Physical function	73.29 ± 23.84	63.79 ± 28.21	45.01 ± 31.09	.001
General health perception	44.67 ± 13.28	48.44 ± 15.18	52.58 ± 14.31	.012
Role limitation	70.18 ± 24.94	52.58 ± 23.88	37.09 ± 22.06	.001
Bodily pain	18.12 ± 16.39	56.29 ± 13.08	75.80 ± 14.33	.001
Social function	48.56 ± 15.20	51.72 ± 22.83	49.19 ± 9.64	.621
Role limitation due to emotional problems	69.63 ± 27.19	64.65 ± 26.50	46.69 ± 23.26	.001
Mental health	48.35 ± 7.56	50.01 ± 6.62	44.75 ± 5.79	.013
General mental health	45.16 ± 8.21	47.31 ± 9.44	38.90 ± 11.00	.001
Physical health	57.49 ± 11.45	54.98 ± 13.01	46.81 ± 14.14	.001
SF-36† total	54.78 ± 9.57	53.18 ± 9.15	44.52 ± 10.88	.001

VAS, Visual Analogue Scale.
*Analysis of variance.
†Health-related quality of life, Short Form 36 (SF-36) Questionnaire.

patients, it is still relatively high in comparison with healthy controls and that the difference is significant. Our findings do not tally with some other investigations reporting similarity in chronic pain intensity not only between kidney recipients and hemodialysis patients[16] but also between kidney recipients and healthy controls.[16,17] Our results, however, chime in with some previous studies reporting more intense chronic pain among hemodialysis patients compared with renal recipients.[9,10] There is also further evidence in the existing literature in line with our results, for example, significantly higher consumption of narcotic analgesics in renal recipients, compared to controls reported by Egfjord and Ladefoged.[18] Several retrospective studies have reported severe pain, musculoskeletal pain, and bone pain among kidney recipients treated with cyclosporine.[19–22] Fifty percent of the kidney recipients filling a detailed pain questionnaire in a study by Forsberg and colleagues stated more than one pain location.[4] What seems lacking in this field, when surveying the literature, is a well-designed case-control study.

Chronic pain after organ transplantation, albeit generally treated as an insignificant issue,[23] is viewed as a major concern by some investigators.[4] In the case of kidney transplantation, patients may experience pain in a number of ways unique to both the treatment employed and the disease process (eg, bone disease, which is common after renal transplantation, or bone pain syndromes).[8] Bone pain syndrome has the highest prevalence in kidney recipients in comparison to other types of organ transplantation including liver, pancreas, heart, lung, and combined organs.[5] Munos-Gomez et al reported that their kidney recipients had developed severe pain with periarticular soft tissue swelling with no effusion and vasomotor changes in the affected areas.[20] Urinary stone,[24] gout,[25] ischemia in lower limbs,[7] and side effects of immunosuppressive agents[6] also cause pain in transplant patients. In this study, chronic pain intensity correlated with the HRQoL score. Evidence in support of our results can be sought in the studies indicating that pain may be an important determinant of HRQoL in the ESRD population on hemodialysis(12), as well as in those finding pain highly relevant in the evaluation of patients' HRQoL[11,26] and well-being.[27] Furthermore, there are investigators associating recurrent pain with higher morbidity.[28,29] In the case of kidney transplantation, chronic pain has been listed by patients as a factor limiting physical functioning.[4]

In conclusion, chronic pain in kidney recipients, albeit less intense by comparison with hemodialysis patients, is more intense than that in healthy controls, and it has a negative impact on several domains of HRQoL. In the light of our findings, we suggest that kidney recipients receive pain management after appropriate screening for pain. Future studies can further delve into the efficacy of such interventions in improving HRQoL.

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