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Incident depression of kidney transplant recipients in South Korea: a long-term population-based study

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Objectives: Depression is associated with impaired quality of life and increased morbidity and mortality in patients with ESRD and kidney transplant recipients (KTRs). Little is known about the incidence and correlates of depression in KTRs. In this study, we aimed to explore the incidence of depression in KTRs compared with ESRD patients and healthy controls (HCs) in a long-term population-based cohort.

Methods: We analyzed a Nationwide Health Insurance Database of South Korea and identified patients who received KT from the year of 2007 to 2015. After exclusion of previous history of depression, KTRs were selected and matched with ESRD patients and HCs with respect to age, sex and inclusion year. KT and ESRD patients were further matched with diabetes and hypertensions. The incidence (incidence ratio, IR per 1000) of depression in KTRs was compared with ESRD patients and HCs, respectively.

Results: Among 5,148 patients in each three groups, KTRs revealed markedly decreased new-onset depression than in ESRD patients (IR, 61.3 vs 19.3; Hazard ratio [HR], 0.31; 95% confidence interval [CI], 0.28-0.35), although they showed only slightly increased incident depression than in HCs (IR, 15.1 vs 19.3; HR, 1.29; 95% CI, 1.13-1.46). Interestingly, after adjusting the comorbidity status with Charlson Comorbidity Index (CCI), KTRs showed a lower risk of incident depression compared with HCs (adjusted HR 0.68; 95% CI, 0.57-0.83, P<0.001), whereas ESRD patients remained in higher risk of depression development than HCs (adjusted HR 2.21; 95% CI, 1.85-2.64, P<0.001). Among KTRs, older age, female sex, lower socioeconomic status, and more co-morbidities represented by CCI score were associated with increased risk of depression.

Conclusions: KTRs showed a markedly lower depression risk than ESRD patients and even than matched HCs after co-morbidities adjustment. Our data suggest a broader role of KT than previously appreciated in terms of improving quality of life by reducing depression incidence.

Table 1.

Table1. baseline characteristics of the study populations

		Esrd	KT	Healthy	p
n		5418	5418	5418	
YEAR					1
	2007	457(8.43)	457(8.43)	457(8.43)	
	2008	558(10.3)	558(10.3)	558(10.3)	
	2009	569(10.5)	569(10.5)	569(10.5)	
	2010	541(9.99)	541(9.99)	541(9.99)	
	2011	671(12.38)	671(12.38)	671(12.38)	
	2012	708(13.07)	708(13.07)	708(13.07)	
	2013	655(12.09)	655(12.09)	655(12.09)	
	2014	644(11.89)	644(11.89)	644(11.89)	
	2015	615(11.35)	615(11.35)	615(11.35)	
AGE_GR					1
	20-29	618(11.41)	618(11.41)	618(11.41)	
	30-39	1340(24.73)	1340(24.73)	1340(24.73)	
	40-49	1768(32.63)	1768(32.63)	1768(32.63)	
	50-59	1337(24.68)	1337(24.68)	1337(24.68)	
	60-69	341(6.29)	341(6.29)	341(6.29)	
	≥70	14(0.26)	14(0.26)	14(0.26)	
SEX					1
	Male	3522(65.01)	3522(65.01)	3522(65.01)	
	Female	1896(34.99)	1896(34.99)	1896(34.99)	
INCOME_Q					<.0001
	aid	1067(19.69)	726(13.4)	98(1.81)	
	Q1	1540(28.42)	1081(19.95)	1411(26.04)	
	Q2	1181(21.8)	1098(20.27)	1396(25.77)	
	Q3	944(17.42)	1157(21.35)	1294(23.88)	
	Q4	686(12.66)	1356(25.03)	1219(22.5)	
YEAR_GR					1
	2007-2009	1584(29.24)	1584(29.24)	1584(29.24)	
	2010-2012	1920(35.44)	1920(35.44)	1920(35.44)	
	2013-2015	1914(35.33)	1914(35.33)	1914(35.33)	
DM					<.0001
	No	3654(67.44)	3654(67.44)	5145(94.96)	
	Yes	1764(32.56)	1764(32.56)	273(5.04)	
HTN					<.0001
	No	437(8.07)	437(8.07)	4701(86.77)	
	Yes	4981(91.93)	4981(91.93)	717(13.23)	
Dyslipidemia					<.0001
	No	3329(61.44)	2448(45.18)	4918(90.77)	
	Yes	2089(38.56)	2970(54.82)	500(9.23)	
RRT modality					<.0001
	preRRT	0(0)	580(10.71)	5418(100)	
	HD	1754(32.37)	1858(34.29)	0(0)	
	PD	403(7.44)	424(7.83)	0(0)	
	Mixed	3261(60.19)	2556(47.18)	0(0)	
면역억제제					<.0001
	No	4648(85.79)	888(16.39)	4903(90.49)	
	Yes	770(14.21)	4530(83.61)	515(9.51)	
AGE		43.53±10.69	43.53±10.69	43.53±10.69	1
RRT vintage period, yr		2.48±2.93	2.63±3.04	0±0	<.0001

Table 2.3.

Table 2. Incidence and mean time to depression in ESRD patients and KTRs

					Model1		Model2	
group	N	depression	Duration	IR(per 1000)	HR(95% CI)	P-value	HR(95% CI)	P-value
ESRD	5418	1267	20682.1	61.2607	1(Ref.)	<.0001	1(Ref.)	<.0001
KT	5418	508	26353.27	19.2765	0.32(0.288,0.354)		0.312(0.281,0.347)	

* adjusted model 1 : age, sex

** adjusted model 2 : age, sex, DM, HTN, dyslipidemia, CCI, income, duration of dialyis

Table 3. Incidence and mean time to depression in Healthy populations, KTRs and ESRD patients

					Model1		Model2	
group	N	depression	Duration	IR(per 1000)	HR(95% CI)	P-value	HR(95% CI)	P-value
Healthy	5418	411	27290.95	15.0599	1(Ref.)	<.0001	1(Ref.)	<.0001
KT	5418	508	26353.27	19.2765	1.285(1.128,1.463)		0.684(0.565,0.827)	
ESRD	5418	1267	20682.1	61.2607	4.048(3.621,4.526)		2.208(1.848,2.638)	

* adjusted model 1 : age, sex

** adjusted model 2 : age, sex, DM, HTN, dyslipidemia, CCI