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Glaucoma incidence in kidney transplant recipients in South Korea: a long-term population-based study.

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Objectives: The risk of glaucoma is known to increase in patients with chronic kidney disease, especially end-stage renal disease (ESRD). However, little is known about the incidence and correlates of glaucoma after kidney transplantation (KT). In this study, we aimed to compare the incidence of glaucoma of KT recipients 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 glaucoma, KT recipients 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 hypertension. The incidence (incidence ratio, IR per 1000) of glaucoma in KT recipients was compared with ESRD patients and HCs, respectively.

Results: A total of 9,623 patients were analyzed in all three groups. Their mean age was 45.3 ± 10.7 years and 58.3% were men. When compared with HCs, the incidence of glaucoma was significantly higher in KT recipients (HCs vs KT: IR, 1.5 vs 8.3 per 1000 patient-year; adjusted HR [aHR], 2.65; 95% confidence interval [CI], 1.82-3.88), as well as in ESRD patients (HCs vs ESRD: IR, 1.5 vs 9.3; aHR, 3.10; 95% CI, 2.12-4.55). There was no difference in the risk of glaucoma between ESRD patients and KT recipients (IR, 9.3 vs 8.3; aHR, 0.86; 95% CI, 0.73-1.01). In multivariate regression, old age, male, and diabetes were associated with increased risk of glaucoma although hypertension and preemptive KT didn't show statistical significance in KT recipients.

Conclusions: KT recipients showed a similar risk for glaucoma with ESRD patients, and the risk was greater than HCs. Increasing age, male gender, and diabetes was a risk factor for glaucoma in KT recipients.

Table 1.

Table 1. Baseline characteristics of study populations.

	ESRD	KT	Healthy	p
n	9623	9623	9623	
YEAR				1
2007	647(6.72)	647(6.72)	647(6.72)	
2008	852(8.85)	852(8.85)	852(8.85)	
2009	902(9.37)	902(9.37)	902(9.37)	
2010	903(9.38)	903(9.38)	903(9.38)	
2011	1170(12.16)	1170(12.16)	1170(12.16)	
2012	1261(13.1)	1261(13.1)	1261(13.1)	
2013	1267(13.17)	1267(13.17)	1267(13.17)	
2014	1305(13.56)	1305(13.56)	1305(13.56)	
2015	1316(13.68)	1316(13.68)	1316(13.68)	
AGE_GR				1
20-29	856(8.9)	856(8.9)	856(8.9)	
30-39	2051(21.31)	2051(21.31)	2051(21.31)	
40-49	3060(31.8)	3060(31.8)	3060(31.8)	
50-59	2821(29.32)	2821(29.32)	2821(29.32)	
60-69	799(8.3)	799(8.3)	799(8.3)	
≥70	36(0.37)	36(0.37)	36(0.37)	
SEX				1
Male	5612(58.32)	5612(58.32)	5612(58.32)	
Female	4011(41.68)	4011(41.68)	4011(41.68)	
INCOME_Q				<.0001
aid	2018(20.97)	1404(14.59)	224(2.33)	
Q1	2724(28.31)	1974(20.51)	2480(25.77)	
Q2	2063(21.44)	1910(19.85)	2342(24.34)	
Q3	1639(17.03)	2000(20.78)	2304(23.94)	
Q4	1179(12.25)	2335(24.26)	2273(23.62)	
YEAR_GR				1
2007-2009	2401(24.95)	2401(24.95)	2401(24.95)	
2010-2012	3334(34.65)	3334(34.65)	3334(34.65)	
2013-2015	3888(40.4)	3888(40.4)	3888(40.4)	
DM	3359(34.91)	3359(34.91)	562(5.84)	<.0001
HTN	8763(91.06)	8763(91.06)	1500(15.59)	<.0001
Dyslipidemia	3830(39.8)	5333(55.42)	1092(11.35)	<.0001
RRT modality				<.0001
preRRT	0(0)	925(9.61)	9623(100)	
HD	3008(31.26)	3300(34.29)	0(0)	
PD	724(7.52)	748(7.77)	0(0)	
Mixed	5891(61.22)	4650(48.32)	0(0)	
연역억제제	1442(14.98)	7998(83.11)	1006(10.45)	<.0001
AGE	45.26±10.71	45.26±10.71	45.26±10.71	1
RRT vintage period, yr	2.74±3.09	3.02±3.27	0±0	<.0001

Table 2.3.

Table 2. Incidence and mean time to glaucoma in ESRD patients and KT recipients

group	N	glaucoma	Duration	IR(per 1000)	Model1		Model2	
					HR(95% CI)	P-value	HR(95% CI)	P-value
ESRD	9623	296	31732.44	9.32799	1(Ref.)	0.1686	1(Ref.)	0.0652
KT	9623	302	36410.82	8.29424	0.893(0.761,1.049)		0.858(0.729,1.01)	

* adjusted model 1 : age, sex

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

Table 3. Incidence and mean time to glaucoma in Healthy populations, KT recipients and ESRD patients.

group	N	glaucoma	Duration	IR(per 1000)	Model1		Model2	
					HR(95% CI)	P-value	HR(95% CI)	P-value
Healthy	9623	57	38034.74	1.49863	1(Ref.)	<.0001	1(Ref.)	<.0001
KT	9623	302	36410.82	8.29424	5.567(4.195,7.388)		2.654(1.816,3.88)	
ESRD	9623	296	31732.44	9.32799	6.269(4.721,8.326)		3.104(2.118,4.551)	

* adjusted model 1 : age, sex

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