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Long-term protective effect of Fimasartan and Losartan in patients with hypertensive diabetic chronic kidney disease: A multi-center, open, retrospective observational study

Hyo Jeong Kim¹, Seon Yeong Lee¹, Kyu Hun Choi¹, Eunjeong Kang², Hyunjin Ryu⁴, Seok Joon Shin⁵, Kook-Hwan Oh³, Beom Seok Kim¹

¹Department of Internal Medicine-Nephrology, Severance Hospital, Korea, Republic of

²Department of Internal Medicine, Ewha Womans University Medical Center, Korea, Republic of

³Department of Internal Medicine-Nephrology, Seoul National University Hospital, Korea, Republic of

⁴Department of Internal Medicine, Seoul National University College of Medicine, Korea, Republic of

⁵Department of Internal Medicine-Nephrology, The Catholic University of Korea, Incheon St. Mary's Hospital, Korea, Republic of

Objectives: Fimasartan, one of the angiotensin receptor blockers (ARBs), was approved in 2010 and has been used as the primary treatment in hypertensive patients with chronic kidney disease. However, there are lack of data comparing the effects of fimasartan on reducing proteinuria with other ARBs. Therefore, this study aims to confirm changes in proteinuria in patients with hypertension and diabetic chronic kidney disease who have been administered fimasartan.

Methods: This study included a total 274 participants, including 111 fimasartan and 163 losartan groups from three institutions. Changes in proteinuria 6, 12, 24, and 36 months after fimasartan administration were measured and compared to baseline. At the same time, changes in estimated glomerular filtration rate (eGFR) and blood pressure during the same period were also measured. The same measurement was performed in the losartan group and compared with fimasartan group, respectively.

Results: In the group administered with fimasartan, proteinuria was significantly decreased at 6 months (27%, $P=0.014$), 12 months (28%, $P=0.017$). There was no significant difference in reduction of proteinuria compared to the losartan group. After adjustment, proteinuria decreased at 6 months, 12 months, 36 months, respectively and no difference was found compared with losartan group. The fimasartan group decreased eGFR faster than the losartan group at 12 months, but at other time point, there was no statistical significant difference. Systolic blood pressure (SBP) was reduced at all the time points in both groups after adjustment, but the SBP reduction of two groups had no difference.

Conclusions: In this study, fimasartan showed a comparable effect on proteinuria reduction compared to losartan.

Table 1. Change in urine PCR according to drugs

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	Fimasartan (N=111)	Losartan (N=163)	p-value [1]	Parameter estimate (β)
urine PCR (mg/g)				
Baseline, n	106	161		
GM \pm GSD	782.0 \pm 3.4	667.4 \pm 3.2	0.284	
6 months, n	55	120		
GM \pm GSD	731.2 \pm 3.2	663.4 \pm 2.8	0.577	
12 months, n	52	115		
GM \pm GSD	679.2 \pm 3.3	642.9 \pm 3.0	0.772	
24 months, n	37	89		
GM \pm GSD	919.7 \pm 4.3	720.9 \pm 3.2	0.327	
36 months, n	13	37		
GM \pm GSD	782.8 \pm 3.3	860.2 \pm 3.2	0.804	
Mean change from baseline to 6 months				
n	53	119		
Baseline, GM \pm GSD	926.4 \pm 3.1	840.6 \pm 2.9	0.590	
6 month, GM \pm GSD	673.3 \pm 3.0	670.1 \pm 2.8	0.978	
Mean change ratio	0.73 \pm 2.49	0.80 \pm 2.21	0.503	
Adjusted mean change ratio [2]	0.73 \pm 1.13	0.78 \pm 1.08	0.654	0.935
Mean change from baseline to 12 months				
n	51	114		
Baseline, GM \pm GSD	901.8 \pm 3.2	795.0 \pm 2.9	0.497	
12 month, GM \pm GSD	652.3 \pm 3.2	650.8 \pm 3.0	0.990	
Mean change ratio	0.72 \pm 2.54	0.82 \pm 2.34	0.403	
Adjusted mean change ratio [2]	0.76 \pm 1.14	0.81 \pm 1.09	0.673	0.934
Mean change from baseline to 24 months				
n	36	88		
Baseline, GM \pm GSD	995.4 \pm 3.2	847.7 \pm 2.6	0.428	
24 month, GM \pm GSD	883.0 \pm 4.3	734.5 \pm 3.2	0.461	
Mean change ratio	0.89 \pm 3.73	0.87 \pm 2.87	0.916	
Adjusted mean change ratio [2]	0.96 \pm 1.24	0.83 \pm 1.14	0.575	1.158
Mean change from baseline to 36 months				
n	13	36		
Baseline, GM \pm GSD	1,054.5 \pm 2.8	820.5 \pm 2.5	0.418	
36 month, GM \pm GSD	782.8 \pm 3.3	895.7 \pm 3.2	0.721	
Mean change ratio	0.73 \pm 3.13	1.09 \pm 2.90	0.278	
Adjusted mean change ratio [2]	1.04 \pm 1.44	1.02 \pm 1.23	0.959	1.023

[1] p-value comparing Fimasartan with Losartan using Two sample t-test

[2] Adjusted with age, sex, baseline eGFR, baseline SBP

Abbreviations: GM, geometric mean; GSD, geometric standard deviation; PCR, protein to creatinine ratio

Table 2. Change in eGFR according to drugs

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	Fimasartan (N=111)	Losartan (N=163)	p-value [1]	Parameter estimate (β)
eGFR (ml/min/1.73m²)				
Baseline, n	111	163		
Mean \pm SD	51.8 \pm 19.5	54.7 \pm 18.3	0.204	
6 months, n	102	150		
Mean \pm SD	48.7 \pm 20.9	53.4 \pm 19.1	0.066	
12 months, n	88	140		
Mean \pm SD	45.0 \pm 20.7	52.2 \pm 19.4	0.008	
24 months, n	68	100		
Mean \pm SD	48.0 \pm 23.4	52.7 \pm 21.4	0.180	
36 months, n	29	19		
Mean \pm SD	46.3 \pm 23.0	61.8 \pm 21.2	0.023	
Mean change from baseline to 6 months				
n	102	150		
Baseline, mean \pm SD	50.9 \pm 19.0	53.8 \pm 17.9	0.213	
6 month, mean \pm SD	48.7 \pm 20.9	53.4 \pm 19.1	0.066	
Mean change	-2.14 \pm 13.41	-0.38 \pm 10.38	0.242	
Adjusted mean change [2]	-2.08 \pm 1.20	-0.64 \pm 1.01	0.368	-1.441
Mean change from baseline to 12 months				
n	88	140		
Baseline, mean \pm SD	50.7 \pm 18.3	53.3 \pm 17.4	0.207	
12 month, mean \pm SD	45.0 \pm 20.7	52.2 \pm 19.4	0.008	
Mean change	-5.71 \pm 14.30	-1.49 \pm 11.76	0.016	
Adjusted mean change [2]	-5.80 \pm 1.41	-1.47 \pm 1.14	0.019	-4.326
Mean change from baseline to 24 months				
N	68	100		
Baseline, mean \pm SD	55.4 \pm 21.8	57.1 \pm 19.4	0.587	
24 month, mean \pm SD	48.0 \pm 23.3	52.7 \pm 21.4	0.179	
Mean change	-7.34 \pm 15.07	-4.39 \pm 12.80	0.173	
Adjusted mean change [2]	-7.12 \pm 1.74	-4.88 \pm 1.43	0.334	-2.242
Mean change from baseline to 36 months				
N	29	19		
Baseline, mean \pm SD	53.7 \pm 22.1	69.40 \pm 21.7	0.019	
36 month, mean \pm SD	46.3 \pm 23.0	61.79 \pm 21.2	0.023	
Mean change	-7.38 \pm 13.16	-7.61 \pm 9.38	0.947	
Adjusted mean change [2]	-8.44 \pm 2.58	-4.97 \pm 3.23	0.425	-3.464

[1] p-value comparing Fimasartan with Losartan using Two sample t-test

[2] Adjusted with age, sex, baseline eGFR, baseline SBP

Abbreviations: eGFR, estimated glomerular filtration rate; SD, standard deviation