

# Burden and Epidemiology of NSAID Prescription in Advanced CKD Patients: A Population-Based Study in Taiwan



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## Introduction

The main goal of chronic kidney disease (CKD) management is to prevent progression of the disease. Non-steroidal anti-inflammatory drugs (NSAIDs) are among the most commonly prescribed drugs with adverse renal effect which should be avoided in CKD patients. The aim of this study is to find the prevalence of NSAID prescription among advanced CKD patients and find predictive risk factors.

## Methods

Nationwide cohort study using claim data of patients diagnosed with advanced chronic kidney disease from Taiwan National Health Insurance Research Database. This study included patients aged  $\geq 20$  years who had a primary diagnosis of CKD and received erythropoiesis-stimulating agent (ESA) treatment not receiving dialysis yet from January 1, 2000 to December 31, 2010. Pain and non-pain related comorbidities were identified using ICD-9 codes. NSAID exposure, prescribed physician and medical care institutions were assessed

## Results

In 22515 advanced CKD patients, 19544 (87.39%) had been prescribed with NSAID after advanced CKD was diagnosed. 65.69% of advanced CKD had been prescribed NSAID 1 year before, 62.97% within 1 year of advanced CKD was diagnosed and 63.9% 1 year after starting dialysis. NSAIDs were most frequently prescribed by general practitioners with 75.55% before diagnosis, 72.91% after diagnosis and 69.84% after dialysis. Factors associated with NSAIDs prescription are age more than 45 years old, hypertension, malignancy, osteoarthritis, rheumatoid arthritis, HIVD, spondylosis enthesopathy, gout, numbers of clinic visits and hospitalized times.

## Conclusions

A high prevalence of NSAID prescription was found in regard to before advanced CKD was diagnosed just diagnosed and post dialysis in Taiwan. NSAIDs were mostly prescribed by general practitioner. Health care providers can pay attention to the elderly, patients with pain-related problems to reduce NSAIDs prescription to advanced CKD patients.

Table 1. NSAIDs prescription frequency in advanced CKD patients

	1y before diagnosis (n=98436)		1 year after diagnosis (n=80425)		1 year after dialysis (n=60151)	
	N	%	N	%	N	%
Gender						
Male	43729	44.42	37408	46.51	26998	44.88
Female	54707	55.58	43017	53.49	33153	55.12
Age						
< 35	1680	1.71	1196	1.49	888	1.48
34~44	5095	5.18	3493	4.34	2585	4.30
45~64	33875	34.41	26180	32.55	22114	36.76
65~74	32350	32.86	27783	34.55	20688	34.39
$\geq 75$	25436	25.84	21773	27.07	13876	23.07
Prescribed hospital level						
Tertiary medical center	7410	7.53	7837	9.74	6144	10.21
Regional hospital	6573	6.68	7147	8.89	6767	11.25
Local hospital	10082	10.24	6803	8.46	5231	8.70
Local clinics (GP)	74371	75.55	58638	72.91	42009	69.84
Prescribed Specialty						
ENT	5994	6.09	4380	5.45	2404	4
FM	19699	20.01	13592	16.9	5911	9.83
Orthopedist	12224	12.42	9143	11.37	7586	12.61
Nephrologist	3568	3.62	11099	13.8	14101	23.44
Internal Medicine others	18443	18.74	14711	18.29	10976	18.25
Rehab	1795	1.82	1230	1.53	898	1.49
Dentist	3250	3.3	3008	3.74	2621	4.36
Surgery	5883	5.98	5225	6.5	3870	6.43
General medicine	15524	15.77	7998	9.94	3368	5.6
Others	12056	12.25	10039	12.48	8416	13.99
Comorbidities						
DM	36201	36.78	30137	37.47	22503	37.41
HTN	68701	69.79	56059	69.7	44533	74.04
CHF	9810	9.97	8117	10.09	5262	8.75
Ischemic heart CAD	5162	5.24	4082	5.08	3034	5.04
Dyslipidemia	2802	2.85	2343	2.91	1878	3.12
Stroke	2918	2.96	2022	2.51	1688	2.81
Malignancy	14518	14.75	11338	14.1	8491	14.12
Osteoarthritis	3882	3.94	2594	3.23	2412	4.01
Rheumatoid arthritis	5700	5.79	4057	5.04	2656	4.42
HIVD	11495	11.68	9254	11.51	6701	11.14
Spondylosis enthesopathy	3965	4.03	2843	3.53	2462	4.09
Gout	37457	38.05	30857	38.37	21689	36.06

Table 2. Risk factors for NSAID use and >30 days usage in first 180 days of advanced CKD diagnosis (N=22515)

Explanatory variables	NSAID prescription			>30 d prescription after		
	OR	95%CI		OR	95%CI	
Gender (reference group: female)						
Male	0.900 ***	0.850	0.953	0.943	0.868	1.024
Age (reference: <35)						
34~44	0.976	0.790	1.206	0.892	0.612	1.302
45~64	0.890	0.740	1.071	1.031	0.744	1.429
65~74	0.963	0.799	1.161	1.402	1.011	1.944
$\geq 75$	0.916	0.758	1.106	1.505	1.084	2.089
Comorbidities (reference: no comorbidities)						
DM	0.989	0.929	1.052	1.041	0.953	1.137
HTN	1.101 **	1.033	1.175	1.034	0.941	1.136
CHF	0.891 *	0.804	0.988	0.929	0.806	1.071
Ischemic heart CAD	1.025	0.894	1.175	1.090	0.899	1.321
Dyslipidemia	0.951	0.802	1.128	0.886	0.686	1.143
Stroke	1.013	0.846	1.213	0.855	0.662	1.106
Malignancy	1.094 *	1.001	1.197	1.156*	1.027	1.303
Osteoarthritis	1.299 **	1.076	1.569	1.376**	1.086	1.744
Rheumatoid arthritis	1.547 ***	1.303	1.835	1.721***	1.405	2.109
HIVD	1.339 ***	1.197	1.497	1.386***	1.204	1.596
Spondylosis enthesopathy	1.346 ***	1.148	1.578	1.295*	1.043	1.607
Gout	1.645 ***	1.543	1.753	2.005***	1.840	2.185
Numbers of clinic visits in 180 days	1.051 ***	1.048	1.054	1.040***	1.037	1.043
Admission numbers in 180 days	1.391 ***	1.349	1.434	1.414***	1.369	1.461

\*, p<0.05, \*\*, p<0.01, \*\*\*, p<0.001