ECONOMIC OUTCOMES OF ANKYLOSING SPONDYLITIS PATIENTS INITIATING BIOLOGIC THERAPY IN TAIWAN - A POPULATION-BASED ANALYSIS

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BACKGROUND

- Ankylosing spondylitis (AS) is a spondylarthritis inflammatory disease affecting the axial skeleton, which can cause back pain due to inflammation as well as other musculoskeletal and extra-articular manifestations[1,2]. The prevalence of AS is estimated to range between 0.1% and 1.4% with a recent study in Taiwan reporting a prevalence rate of 23.7 per 10,000 persons[3].
- The primary objective when treating AS is to reduce disease activity and improve complications and manifestations[4,5]. Treatments for AS include nonsteroidal anti-inflammatory drugs (NSAIDs), conventional synthetic antirheumatic drugs (csDMARDs) for patients with peripheral arthritis, and biologics[4,5].

OBJECTIVE

- To describe patients initiating their first biologic therapy for ankylosing spondylitis and compare their economic outcomes to a cohort of patients treated with non-biologic therapy in a population-based claims database.

METHODS

- This longitudinal retrospective study utilized Taiwan's National Health Insurance Database. The full data set of all patients with AS between 1/1/2014 and 12/31/2017 was considered.
- Patients with AS were identified during the index period running from 1/1/2015 through 12/31/2015 using the following inclusion criteria:
  - ≥ 2 primary or secondary healthcare claims for ankylosing spondylitis (ICD-9: 720.0 or ICD-10: M45, M46.8, M46.9) in any setting, with the second claim coming within 90 days of the first claim during the index period
  - ≥ 18 years of age at index
  - Continuous enrollment for one year of follow-up after index
- Furthermore, a cohort of AS patients initiating their first biologic (biologic-initiators) was identified during the index period using the following inclusion criteria:
  - ≥ 1 claim for adalimumab (ATC=L04AB04), etanercept (ATC=L04AB01), or golimumab (ATC=L04AB06) during the index period
  - No claim(s) for adalimumab (ATC=L04AB04), etanercept (ATC=L04AB01), or golimumab (ATC=L04AB06) during the one-year pre-index period
- A matched cohort was developed using the remaining non-biologic-initiator AS patients fitting the following criteria:
  - ≥ 1 claim for an NSAID
  - No claim(s) for a biologic during the study period (January 1, 2014, and December 31, 2017)
- Patients were first matched 1 case to 4 controls using propensity score methods based on birth year, gender, and Charlson comorbidity index (CCI) scores.
- The biologic-initiators and matched cohort were followed for a minimum of one year following the index date. During the follow-up period healthcare costs reimbursed by the National Health Insurance Administration were measured for both cohorts of patients. Costs were reported as all-cause and in NT$.

RESULTS

Patient Characteristics

- Of the 33,276 total patients with AS in 2015, there were 430 biologic-initiators identified and a matched cohort consisting of 1,678 patients was calculated. The cohorts were well balanced based on age gender, and CCI (Table 1). Within AS-associated comorbidities, there were significant differences identified in the prevalence of coronary artery disease (p=0.0193), hypertension (p<0.0001), peripheral vascular disease (p=0.0208), inflammatory bowel disease (p<0.0001), asthma (p=0.0209), and uveitis (p<0.0001).

Table 1. Baseline Patient Demographics and Characteristics

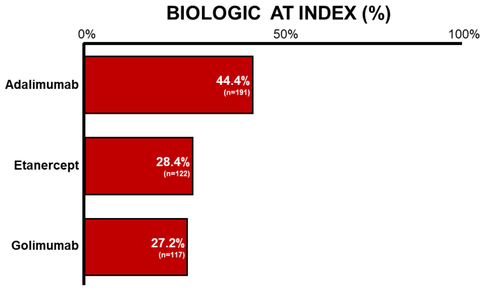
CHARACTERISTICS	BIOLOGIC INITIATORS (n=430)		MATCHED COHORT (n=1,678)		P-VALUE
	N	%	N	%	
Age					0.6813
Mean (SD)	41.9 ± 14.1		41.6 ± 13.9		
Median (IQR)	41.0 (29.8-53.7)		41.5 (30.3-53.3)		
Gender, Male	310	72.1	1216	72.5	0.8769
CCI (mean, SD)	0.8 ± 1.3		0.7 ± 1.1		0.2484
Cardiovascular	108	25.1	278	16.6	<0.0001
Angina	10	2.3	25	1.5	0.2263
Atherosclerosis	14	3.3	35	2.1	0.1508
Cerebrovascular disease/Stroke	7	1.6	48	2.9	0.1525
Coronary Artery Disease	**21**	**4.9**	**45**	**2.7**	**0.0193**
Hypertension	**97**	**22.6**	**242**	**14.4**	**<0.0001**
Myocardial Infarction	3	0.7	4	0.2	0.1546
Peripheral Vascular Disease (PVD)	**6**	**1.4**	**7**	**0.4**	**0.0208**
Venous Thromboembolism (VTE)	3	0.7	4	0.2	0.1546
Gastrointestinal Disorder	97	22.6	313	18.7	0.0680
Inflammatory Bowel Disease (IBD)	**10**	**2.3**	**7**	**0.4**	**<0.0001**
Peptic Ulcer Disease	94	21.9	310	18.5	0.1115
Malignancies	7	1.6	32	1.9	0.7016
Metabolic Syndrome	73	17.0	244	14.5	0.2074
Diabetes	33	7.7	142	8.5	0.5972
Dyslipidemia	52	12.1	191	11.4	0.6807
Neurologic / Psychologic Conditions	2	0.5	1	0.1	0.1077
Multiple Sclerosis	0	0.0	0	0.0	-----
Parkinson Disease	2	0.5	1	0.1	0.1077
Respiratory Diseases	**11**	**2.6**	**81**	**4.8**	**0.0399**
Asthma	**8**	**1.9**	**71**	**4.2**	**0.0209**
Sleep Apnea	3	0.7	12	0.7	0.9693
Other Diseases	**68**	**15.8**	**95**	**5.7**	**<0.0001**
Osteoporosis	13	3.0	27	1.6	0.0552
Uveitis	**59**	**13.7**	**69**	**4.1**	**<0.0001**
Psoriasis	30	7.0	12	0.7	<0.0001
Rheumatoid Arthritis	45	10.5	88	5.2	<0.0001

Notes: **Bold** = Statistically Significant (p<.05); CCI = Charlson Comorbidity Index; SD = Standard Deviation; IQR = Interquartile Range

Treatment Selection

- The majority of biologic-initiators were indexed on adalimumab (n=191; 44.4%), followed by etanercept (n=122; 28.4%), and golimumab (n=117; 27.2%) (Figure 1).

Figure 1. Biologic Therapy at Index



Cost Outcomes

- Total healthcare costs were higher for biologic-initiators compared to the matched cohort in both years of follow-up (Table 2). The higher costs in the biologic-initiators cohort were driven by the cost of biologics. In the first year of follow-up, medication costs were 90.7% (NT$525,559) of total healthcare costs for biologic-initiators compared to 24.5% (NT$18,434) in the matched cohort.

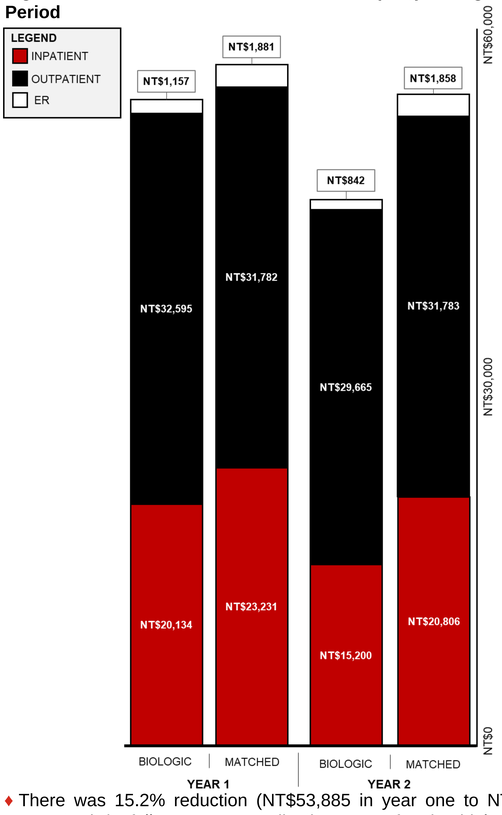
Table 2. Healthcare Costs (NT$) During the Follow-Up Period

COST (NT$)	BIOLOGIC INITIATORS				MATCHED COHORT			
	YEAR 1 (n=430)		YEAR 2 (n=427)		YEAR 1 (n=1,678)		YEAR 2 (n=1,671)	
	MEAN	SD	MEAN	SD	MEAN	SD	MEAN	SD
Inpatient Costs								
Medication	3,993.8	31,749.4	2,953.8	24,332.7	2,800.3	29,310.1	1,729.2	11,694.1
Non-Medication	20,134.1	113,039.6	15,200.2	65,393.5	23,230.5	109,211.9	20,806.3	78,434.8
Total Inpatient Costs	24,128.0	138,208.0	18,153.9	80,088.3	26,030.7	133,812.7	22,535.5	87,316.0
Outpatient Costs								
Medication	521,475.9	172,750.0	522,513.8	172,380.2	15,523.5	39,020.9	15,336.7	38,555.5
Non-Medication	32,594.7	48,518.2	29,664.7	21,338.3	31,781.7	55,414.4	31,783.3	55,488.8
Total Outpatient Costs	554,070.6	180,811.8	552,178.5	177,513.3	47,305.2	72,367.1	47,120.0	72,204.5
ER Costs								
Medication	88.7	426.6	69.7	332.9	110.2	603.4	105.5	575.3
Non-Medication	1,156.5	5,176.8	841.8	2,458.8	1,881.1	5,716.7	1,857.8	5,704.2
Total ER Costs	1,245.2	5,495.1	911.5	2,657.3	1,991.3	6,017.8	1,963.4	5,991.4
Total Costs								
Medication	525,558.5	172,269.4	525,537.3	17,2795.3	18,434.0	50,619.4	17,171.4	41,107.2
Non-Medication	53,885.3	148,702.2	45,706.6	75,296.6	56,893.3	13,6371.4	54,447.4	111,897.6
Total Costs	579,443.8	233,906.7	571,243.9	194,007.1	75,327.2	16,7513.6	71,618.8	130,881.3

Notes: ER = Emergency Room; All Costs in NT$; Non-Medication costs include all reimbursed direct healthcare costs except pharmacy costs.

- Average non-medication costs were lower in both follow-up years for biologic-initiators compared to the matched cohort. In the first year of follow-up, non-medication costs were NT$53,885 for biologic initiators compared to NT$56,893 in the matched cohort (Figure 2).

Figure 2. Non-Medication Healthcare Costs (NT$) During Follow-Up Period



- There was 15.2% reduction (NT$53,885 in year one to NT$45,707 in year two) in follow-up non-medication costs for the biologic-initiators, while 4.3% (NT$56,893 in year one to NT$54,447 in year two) in the matched cohort (Figure 2).

CONCLUSIONS

- Non-medication costs were reduced in the second year after initiating biologics, while matched cohort treated with NSAIDs did show little reduction.

REFERENCES

[1]Braun, Jürgen, and Joachim Sieper. The Lancet 369.9570 (2007): 1379-1390; [2]El Maghraoui, Abdellah. European Journal of Internal Medicine 22.6 (2011): 554-560; [3]Hsieh, M-Y., and C-F. Kuo. (2016): 590-591; [4]Smolen, Josef S., et al. Annals of the rheumatic diseases 77.1 (2018): 3-17. [5]Ward, Michael M., et al. Arthritis care & research 71.10 (2019): 1285-1299.

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