

BACKGROUND

- Opioid use among individuals with spondyloarthritis is common, reported to be ~20-30% in some cohorts.
- Data on whether this subset of patients have higher utilization of the healthcare system are lacking.

OBJECTIVE

- Our objective was to examine the association between opioid use and healthcare utilization and costs among patients with psoriatic arthritis (PsA) and ankylosing spondylitis (AS).**

METHODS

- This retrospective cohort study included adult participants enrolled in the FORWARD Databank. Patients who were diagnosed with PsA or AS and completed ≥ 1 questionnaire with Health Assessment Questionnaire Disability Index (HAQ-DI) and/or Bath Ankylosing Spondylitis Disease Activity Index (BASDAI; added in 2018) from January 2010 to December 2019 were included.
- PsA and AS were studied separately and among the available questionnaires, the most recent observation period was used.
- Patient report of opioid use was the exposure of interest, and the outcomes were healthcare utilization and prescription costs over the course of one year.
- Student's t-tests or Chi-squared tests were used when appropriate to examine differences in costs by group.
- To measure the association between opioid use and the utilization outcomes, we used negative binomial regressions and report both models adjusted for age and sex, and additionally adjusted for hospitalization.
- To model the association between opioid use and costs, we used generalized linear models with gamma distribution and log link function.

CONCLUSIONS

- Compared to patients not using opioids, patients with PsA and AS who used opioids had higher healthcare utilization and higher costs. New care pathways for these patients are needed to improve care and reduce costs.**

Table 3 – Incident Rate Ratio (IRR) for healthcare utilization and relative healthcare costs (expβ) by opioid use and adjusted for age, sex, and/or hospitalizations in PsA and AS cohorts

PsA	Adjusted for:			Age, sex & hospitalizations		
	Opioid use	IRR	95%CI	Opioid use	IRR	95%CI
Hospitalization		1.50	(0.84 - 2.68)			
ER visits		1.57	(0.97 - 2.55)	1.62*		(1.03 - 2.55)
Medical visits		1.36*	(1.22 - 1.50)	(a)	1.33*	(1.21 - 1.47)
Diagnostic tests		1.62*	(1.31 - 2.01)	(a)	1.56*	(1.27 - 1.92)
Procedures		1.47	(0.90 - 2.39)		1.46	(0.90 - 2.37)
Costs	Base value	Rel. Cost	95%CI	Base value	Rel. Cost	95%CI
Hospitalizations	303	1.77	(0.94 - 3.32)			
ER visits	140	1.48	(0.99 - 2.21)	114	1.61*	(1.02 - 2.53)
All medical visits	2632	1.30*	(1.16 - 1.45)	2706 (a)	1.28*	(1.14 - 1.43)
Diagnostic tests	304	1.37*	(1.10 - 1.70)	316	1.35*	(1.10 - 1.67)
Procedures	76	1.69*	(1.02 - 2.81)	76	1.68*	(1.01 - 2.79)
Direct medical	2069	1.57*	(1.15 - 2.13)	2957 (a)	1.35*	(1.20 - 1.52)
csDMARD	916	1.33	(0.83 - 2.14)	916	1.34	(0.83 - 2.15)
Biologic	44215	1.24*	(1.02 - 1.51)	411368 (a)	1.26*	(1.04 - 1.54)
Gen. arthritis meds**	1152	1.27	(0.89 - 1.80)	1137	1.28	(0.90 - 1.82)
Other medications	1519	2.19*	(1.74 - 2.77)	1563 (a)	2.16*	(1.71 - 2.73)
AS	Opioid use	IRR	95%CI	Opioid use	IRR	95%CI
Hospitalization		2.05	(0.82 - 5.14)			
ER visits		1.86	(0.93 - 3.70)		1.48	(0.76 - 2.86)
Medical visits		1.36*	(1.16 - 1.58)		1.32*	(1.13 - 1.53)
Diagnostic tests		1.92*	(1.37 - 2.69)		1.76*	(1.27 - 2.45)
Procedures		1.87	(0.78 - 4.47)		1.95	(0.82 - 4.63)
Costs	Base value	Rel. Cost	95%CI	Base value	Rel. Cost	95%CI
Hospitalizations	1257	1.68	(0.70 - 4.00)			
ER visits	462	1.59	(0.89 - 2.85)	347	1.31	(0.71 - 2.43)
All medical visits	3818	1.27*	(1.08 - 1.50)	3660	1.25*	(1.06 - 1.47)
Diagnostic tests	523	1.50*	(1.10 - 2.05)	490	1.38*	(1.03 - 1.85)
Procedures	213	3.28*	(1.51 - 7.15)	185	3.42*	(1.52 - 7.67)
Direct medical	4996	1.56	(0.98 - 2.50)	4188	1.34*	(1.12 - 1.60)
csDMARD	201	6.11*	(2.48 - 15.10)	139 (a)	6.49*	(2.62 - 16.06)
Biologic	40362	1.52*	(1.10 - 2.08)	39989 (a)	1.52*	(1.11 - 2.10)
Gen. arthritis meds**	703	1.32	(0.47 - 3.72)	743	1.31	(0.47 - 3.62)
Other medications	2588	2.35*	(1.66 - 3.33)	2345 (a)	2.33*	(1.63 - 3.33)

*P<0.05; (a) still significant after further adjustment by HAQ-DI; **NSAIDs, aspirin, Tylenol, etc.

- Opioid users were more likely to have higher health care utilization and medical costs, specifically medical visits, diagnostic tests, direct medical costs and pharmacy costs (biologics and other drugs).
- PsA opioid users had a 33% more medical visits annually when compared those not using opioids (results adjusted for age, sex, and hospitalizations). Similarly, patients with AS utilizing opioids had a 32% increase in medical visits compared to patients not using opioids. Annual number of diagnostic tests were similarly elevated for opioid users: 56% (PsA) and 68% (AS).
- Patients using opioids spent more on medical visits annually compared to those not using opioids: 28% more among those with PsA and similarly among those with AS.
- Opioid users (PsA or AS patients) also tended to spend more on medications including biologics, csDMARDs, and other drug costs.

Table 1 – Baseline characteristics and anti-rheumatic medication use in the PsA and AS cohorts.

Baseline characteristics	PsA (n=828)		AS (n=334)	
	Not on opioids (n=651)	Opioid users (n=177)	Not on opioids (n=243)	Opioid users (n=91)
Age, mean (SD)	58.79 (13.87)	57.43 (11.96)	54.48 (14.89)	54.29 (12.44)
Sex of patient, % (n)	29.34 (191)*	21.47 (38)	40.33 (98)	32.97 (30)
Education level in years, mean (SD)	14.60 (2.25)	14.36 (2.19)	14.64 (2.36)	14.13 (3.08)
Comorbidity Index (0-9), mean (SD)	2.04 (1.73)	2.59 (1.69)*	1.97 (1.74)	2.75 (1.68)*
White ethnicity, % (n)	92.15 (540)	94.41 (152)	95.39 (207)	92.41 (73)
Disease duration, mean (SD)	17.19 (12.07)	18.69 (13.44)	21.74 (15.12)	21.08 (13.22)
Ever smoked?, % (n)	44.85 (292)	54.80 (97)*	47.33 (115)	58.24 (53)
HAQ Disability score-Clinic, mean (SD)	0.82 (0.71)	1.24 (0.67)*	0.70 (0.64)	1.35 (0.66)*
BASDAI Total score, mean (SD)	3.52 (2.38)	4.87 (2.36)*	3.18 (2.09)	6.26 (1.51)*
Individual drug use				
csDMARD use, % (n)	41.47 (270)	50.85 (90)*	20.16 (49)	31.87 (29)*
Biologic use, % (n)	46.70 (304)	58.19 (103)*	40.74 (99)	59.34 (54)*
General arthritis medications**, % (n)	59.75 (389)	79.66 (141)*	60.08 (146)	81.32 (74)*
Other medication use***, % (n)	71.27 (464)	92.66 (164)*	65.43 (159)	94.51 (86)*

*p<0.05; **NSAIDs, aspirin, Tylenol, etc.; ***any other reported medications

- Of 828 PsA patients, 21.3% used opioids. Of 334 AS patients, 27.4% used opioids. Opioids users had more comorbidities, higher prevalence of smoking, and worse disease activity (by HAQ-DI or BASDAI) in both cohorts. They also tended to have higher use of any antirheumatic drug class (Table 1).

Table 2 – Mean (SD) of the annualized healthcare utilization and costs by diagnosis and opioid use

Cohort:	PsA		AS	
	Not on opioids (n=651)	Opioid users (n=177)	Not on opioids (n=243)	Opioid users (n=91)
Healthcare utilization				
Hospitalizations	0.27 (0.91)	0.38 (1.04)	0.21 (0.74)	0.53 (1.36)*
ER visits	0.45 (1.18)	0.71 (1.56)*	0.50 (1.37)	0.97 (1.96)*
Medical visits	18.62 (13.48)	24.44 (16.03)*	17.36 (12.60)	23.13 (14.22)*
Diagnostic tests	4.63 (6.23)	6.67 (8.26)*	3.65 (4.66)	6.90 (9.11)*
Procedures	0.37 (1.01)	0.54 (1.06)*	0.31 (0.93)	0.51 (1.25)
Healthcare utilization costs (US\$)				
Hospitalization costs	2943 (11300)	4433 (13880)	2697 (10460)	5492 (15000)
ER visits costs	170 (452)	263 (550)*	205 (540)	338 (660)
All medical visits costs	2101 (1560)	2722 (1880)*	2037 (1590)	2486 (1390)*
Diagnostic tests costs	443 (620)	579 (690)*	438 (600)	630 (776)*
Procedures costs	144 (480)	235(630)	121 (490)	293 (860)
Overall healthcare costs				
Outpatient Pharmacy Costs	32929 (37580)	49768 (41570)*	28304 (38680)	52027 (46630)*
Direct medical costs	5803 (12120)	8233 (14500)*	5501 (11260)	9241 (15770)*
Drug group costs				
Opioid costs		4028 (7100)		3927 (8220)
csDMARD costs	1023 (3170)	1581 (4090)	652 (2660)	2473 (6900)*
Biologic costs	26660 (34380)	33497 (35580)*	23241 (33610)	36125 (37720)*
Gen. arthritis medication costs**	1224 (2890)	1526 (2580)	5531 (8940)	13678 (11610)*
Other medication costs	6834 (10300)	13808 (12370)*	1973 (11470)	2573 (5980)

*P<0.05, **NSAIDs, aspirin, Tylenol, etc