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Exploring Weight Trends in Psoriatic Arthritis: Unraveling Effects of Drugs

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SESSION INFORMATION

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Session Type: Abstract Session

Title: Abstracts: SpA Including PsA – Diagnosis, Manifestations, & Outcomes II

Session Time: 3:00PM-4:30PM

Background/Purpose: Previous studies have reported weight gain in Psoriatic arthritis (PsA) with biologics like TNF inhibitors (i). In contrast, no significant increase in body weight was found among patients receiving conventional synthetic (cs)DMARDs, Interleukin (IL)-12/23i, and IL-17i. These studies focused on absolute weight differences, with the drawbacks of smaller sample sizes and failure to adjust for other factors. We aimed to study the change in weight with the use of csDMARDs, biologic (b)DMARDs, Janus Kinase i (JAKi), and apremilast, along with other factors affecting weight across the cohort.

Methods: Patients receiving NSAIDs or no medications, csDMARDs only (with or without NSAIDs), TNFi as the first biologic, anti-IL12/23i, anti-IL17i, IL23i, JAKi, and apremilast at any point more than a year were identified from the database of a large cohort. The weight trend before and after each drug was studied by adjusting for age, sex, disease duration, comorbidities, disease activity (PASI and swollen joint count-SJC), line of treatment, and smoking using a linear mixed-effect model. Factors affecting weight over time for the cohort were studied using another linear mixed model adjusting for the above factors along with baseline weight and all drugs received.

Results: A total of 1754 patients were included, with 473 on NSAIDs or no medications, 571 on csDMARDs, 702 on bDMARDs, 42 on JAKi, and 70 on apremilast. The age at baseline, onset of psoriasis, and PsA were lower in the bDMARD group. Baseline weight, proportion with hypertension, PASI, and DAPSA scores were higher in the apremilast group. The proportion with HLA-C6 was the highest in the NSAIDs or no medication group. (Table 1)

On change point analysis comparing the mean of slopes for weight change before and after medication use for each patient, significant weight loss was observed with IL17i (p 0.001), IL23i (p=0.002), and csDMARDs (p 0.001). The weight change was not significant with TNFi, IL12/23i, or apremilast. However, a trend towards weight gain was observed with TNFi and weight loss with apremilast. (Figure 1)

When factors influencing weight were compared across the cohort, weight gain was observed with TNFi, IL-12/23i, longer duration of follow-up, higher baseline weight, hypertension, and male sex. The use of apremilast, older age, and diabetes mellitus were associated with weight loss. (Table 2)

Conclusion: Significant weight loss was observed after initiation of IL17i, IL23i, and csDMARDs in PsA as compared to weight before initiation of these drugs. However, amongst the drugs, the use of TNFi and IL12/23i was associated with weight gain, whereas apremilast was associated with weight loss when compared across the cohort.

	All patients at baseline	Patients who ever took bDMARDs	Patients who ever took csDMARDs (but no bDMARDs)	Patients who only took NSAIDs or no medications	Patients who ever took JAKi (Tofacitinib, Upadacitinib)	Patients who ever took PDE4i (Apremilast)
n	1754	702	556	469	42	70
Age	44.91 (13.29)	43.15 (13.13)	46.24 (13.12)	45.83 (13.63)	47.52 (13.96)	46.15 (12.62)
Age at onset of psoriasis	29.05 (14.90)	27.37 (14.20)	30.85 (15.48)	29.50 (15.08)	29.05 (14.19)	27.16 (14.27)
Age at onset of PsA	38.68 (13.86)	37.24 (13.74)	39.49 (14.07)	39.73 (13.72)	39.19 (13.30)	40.06 (13.62)
Duration of PsA	6.23 (8.07)	5.94 (7.52)	6.72 (8.53)	6.11 (8.13)	8.33 (8.74)	6.14 (9.22)
Duration of psoriasis	15.83 (13.17)	15.73 (12.76)	15.42 (13.51)	16.31 (13.44)	18.16 (13.91)	18.99 (12.98)
Sex, Male (%)	961 (54.9)	397 (56.6)	303 (54.6)	251 (53.6)	24 (57.1)	34 (48.6)
Race, White (%)	1457 (85.4)	590 (84.9)	475 (86.1)	372 (85.9)	35 (89.7)	59 (84.3)
Weight in kilograms	82.91 (19.02)	85.11 (19.81)	83.41 (19.60)	77.68 (18.50)	84.79 (18.96)	94.14 (21.75)
BMI	28.78 (6.30)	29.50 (6.81)	29.56 (6.70)	27.16 (6.17)	29.08 (5.09)	34.21 (8.90)
Smoking status (%)						
Never	915 (67.5)	400 (63.4)	288 (72.4)	214 (70.4)	21 (53.8)	32 (54.2)
Current	292 (21.5)	145 (23.0)	74 (18.6)	67 (22.0)	9 (23.1)	14 (23.7)
Past	149 (11.0)	86 (13.6)	36 (9.0)	23 (7.6)	9 (23.1)	13 (22.0)
Comorbidities						
Hypertension (%)	254 (14.8)	106 (15.1)	83 (14.9)	62 (14.2)	7 (16.7)	14 (20.0)
Hyperlipidemia (%)	118 (8.4)	56 (8.8)	41 (10.0)	20 (6.2)	4 (10.0)	4 (5.9)
Diabetes Mellitus (%)	106 (6.9)	63 (9.0)	30 (5.7)	16 (4.0)	7 (16.7)	6 (8.6)
Disease Phenotype						
NAIL disease (%)	863 (63.8)	387 (61.4)	281 (68.7)	181 (62.8)	17 (41.5)	38 (56.7)
Dactylitis (%)	458 (26.8)	183 (26.3)	165 (29.8)	105 (24.0)	11 (26.2)	13 (18.8)
Enthesitis (%)	326 (19.2)	172 (24.7)	84 (15.4)	60 (13.9)	16 (38.1)	16 (23.2)
SJC (median [IQR])	2.00 [0.00, 5.00]	2.00 [0.00, 5.00]	2.00 [0.00, 6.00]	1.00 [0.00, 2.00]	2.50 [0.00, 5.75]	3.00 [0.00, 6.00]
TJC (median [IQR])	4.00 [1.00, 10.00]	5.00 [1.00, 11.00]	4.00 [1.00, 11.00]	2.00 [0.00, 8.00]	4.00 [1.00, 9.75]	3.50 [0.00, 9.00]
AJC (median [IQR])	6.00 [2.00, 12.00]	6.00 [2.00, 14.00]	7.00 [3.00, 14.00]	3.00 [1.00, 9.00]	5.50 [2.25, 12.50]	5.00 [1.00, 12.75]
DJC (median [IQR])	0.00 [0.00, 1.00]	0.00 [0.00, 1.00]	0.00 [0.00, 2.00]	0.00 [0.00, 1.00]	0.00 [0.00, 2.75]	0.00 [0.00, 0.00]
Disease Activity and HAQ						
PASI score (median [IQR])	1.20 [0.00, 4.10]	1.80 [0.00, 4.90]	0.60 [0.00, 3.90]	0.40 [0.00, 3.00]	0.80 [0.00, 2.07]	2.40 [0.50, 4.00]
DAPSA score (median [IQR])	17.00 [9.00, 28.99]	18.00 [10.00, 31.00]	14.90 [9.00, 26.00]	13.40 [7.12, 22.30]	26.90 [17.50, 40.20]	19.69 [14.00, 33.52]
HAQ score	0.79 (0.66)	0.86 (0.67)	0.76 (0.65)	0.58 (0.62)	1.32 (0.86)	0.83 (0.72)
Radiology						
Erosions (%)	816 (52.3)	344 (53.4)	299 (58.3)	167 (44.2)	22 (62.9)	25 (36.8)
RDJC (median [IQR])	1.00 [0.00, 4.00]	1.00 [0.00, 4.00]	1.00 [0.00, 5.00]	0.00 [0.00, 3.00]	1.00 [0.00, 4.50]	0.00 [0.00, 2.00]
Steinbroker score (median [IQR])	2.00 [0.00, 10.00]	2.00 [0.00, 10.00]	2.00 [0.00, 12.00]	0.00 [0.00, 6.00]	3.00 [0.00, 12.00]	0.00 [0.00, 6.00]
Syndesmophytes (%)	190 (13.3)	62 (10.9)	76 (16.1)	51 (14.0)	2 (8.3)	2 (3.3)
Sacroiliitis (%)	324 (22.7)	155 (27.2)	106 (22.3)	61 (16.9)	7 (28.0)	11 (18.0)
Laboratory values						
Abnormal ESR (%)	653 (44.9)	278 (46.7)	241 (50.2)	126 (35.2)	15 (48.4)	24 (42.1)
Abnormal CRP (%)	289 (51.2)	172 (55.5)	64 (51.6)	47 (40.5)	13 (56.5)	17 (51.5)
HLA-B27 (%)	202 (16.6)	94 (16.1)	73 (17.8)	34 (16.7)	2 (8.7)	4 (6.3)
HLA-C6 (%)	325 (26.8)	134 (23.0)	109 (26.7)	79 (38.7)	4 (18.2)	14 (22.2)

*Data are expressed as mean (SD) unless specified as n (%) or median (IQR)
AJC- Active Joint Count, b- biologic, BMI- Body Mass Index, cs- conventional synthetic, DMARDS- Disease Modifying Anti-Rheumatic Drugs, DAPSA- Disease Activity in

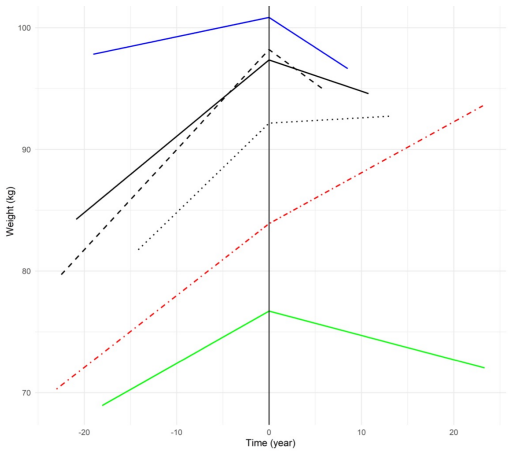
Psoriatic Arthritis, DJC- Damage Joint Count (clinical), HLA- Human Leukocyte Antigen, i-inhibitors, JAK- JAnus Kinase, PASI- Psoriasis Area and Severity Index, SJC- Swollen Joint Count, RDJC- Radiologic Damage Joint Count, TJC- Tender Joint Count.

Table 1. Demographic, clinical, and treatment characteristics at the time of enrollment into the cohort

		Estimate	p-value
(Intercept)		9.34	<0.001***
TNFi		1.73	<0.001***
IL-17i		0.35	0.485
IL-12/23i		1.42	0.030*
IL-23i		-0.07	0.933
JAKi		1.08	0.341
Apremilast		-2.63	<0.001***
Courses of biologic drugs or JAKi taken	Overall		0.453
	1st	-0.28	0.482
	2nd	-0.04	0.942
	3rd or more	0.28	0.595
csDMARDs		0.36	0.079
NSAIDs		0.31	0.087
Time from first weight measurement		0.15	<0.001***
Age		-0.05	0.001**
Sex (male)		1.06	0.007**
PsA duration		-0.02	0.266
Baseline weight		0.91	<0.001***
PASI score		0.01	0.575
SJC		-0.05	0.051
Hypertension		1.04	<0.001***
Diabetes Mellitus		-0.94	0.019*
Smoking	Overall		0.053
	Current	0.63	0.095
	Past	-0.11	0.796

*cs- conventional synthetic, DMARDs- Disease Modifying anti-Rheumatic Drugs, JAK- JAnus Kinase, IL-Interleukin, i- inhibitors, NSAID- Non-Steroidal Anti-Inflammatory Drugs, PASI- Psoriasis Area and Severity index, PsA- Psoriatic Arthritis, SJC- Swollen Joint Count, TNF- Tumour Necrosis Factor

Table 2. Linear mixed model for factors associated with weight over time for 1289 patients who have available weight readings



	Slope before drug initiation, mean (SD)	Slope after drug initiation, mean (SD)	p-value
TNFi, n=274	0.59 (0.14)	0.42 (0.14)	0.202
IL-17i	0.63(0.20)	-0.26(0.25)	<0.001
IL-12/23i	0.73 (0.43)	0.04 (0.50)	0.102
IL-23i	0.82 (0.34)	-0.56 (0.56)	0.005
Apremilast	0.16 (0.46)	-0.49 (1.14)	0.586
csDMARDs	0.43 (0.24)	-0.20 (0.26)	<0.001

*The average weight before (n=42) and after one year of JAKi(n=18) use was 87.28(20.06)kg and 84.77(18.7) kg. Change point modeling was not done due to low numbers

cs- conventional synthetic, DMARDs- Disease Modifying anti-Rheumatic Drugs, JAK- JAnus Kinase, IL-Interleukin, i- inhibitors, PsA- Psoriatic Arthritis, TNF- Tumour Necrosis Factor

Figure 1. Change point analysis comparing the mean of slopes for weight change before and after medication use.

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