Risk of treatment discontinuation among patients with psoriasis initiated on ustekinumab and other biologics in the United States

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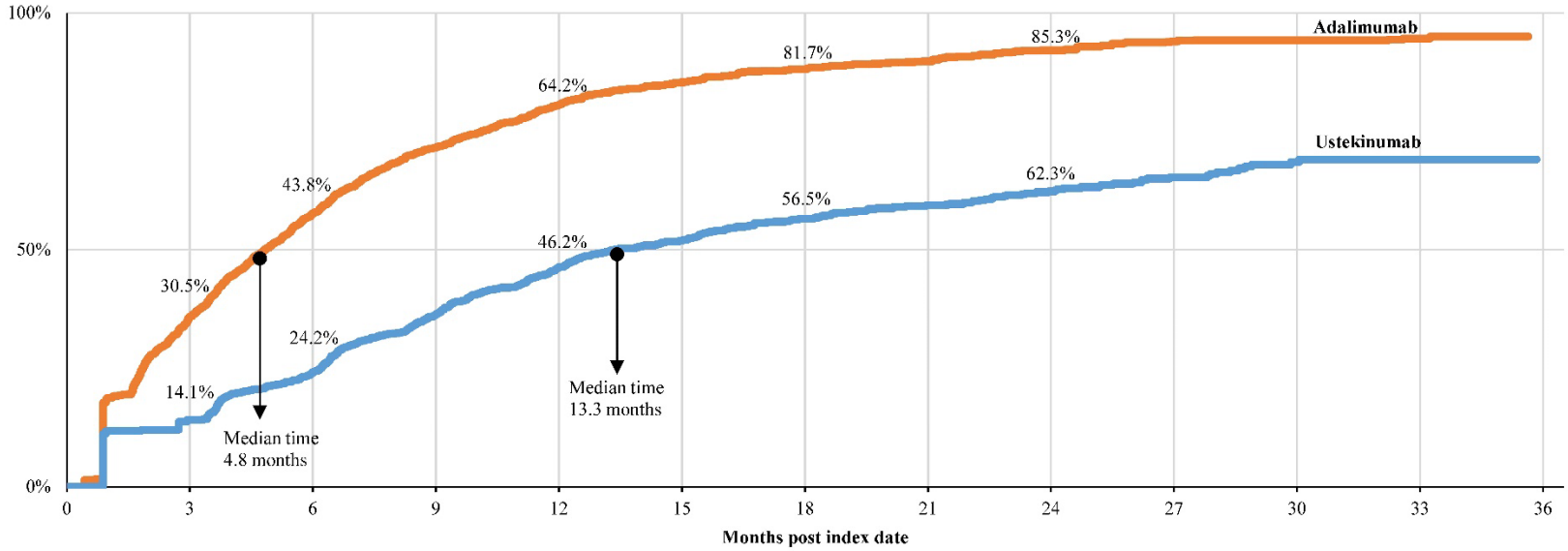
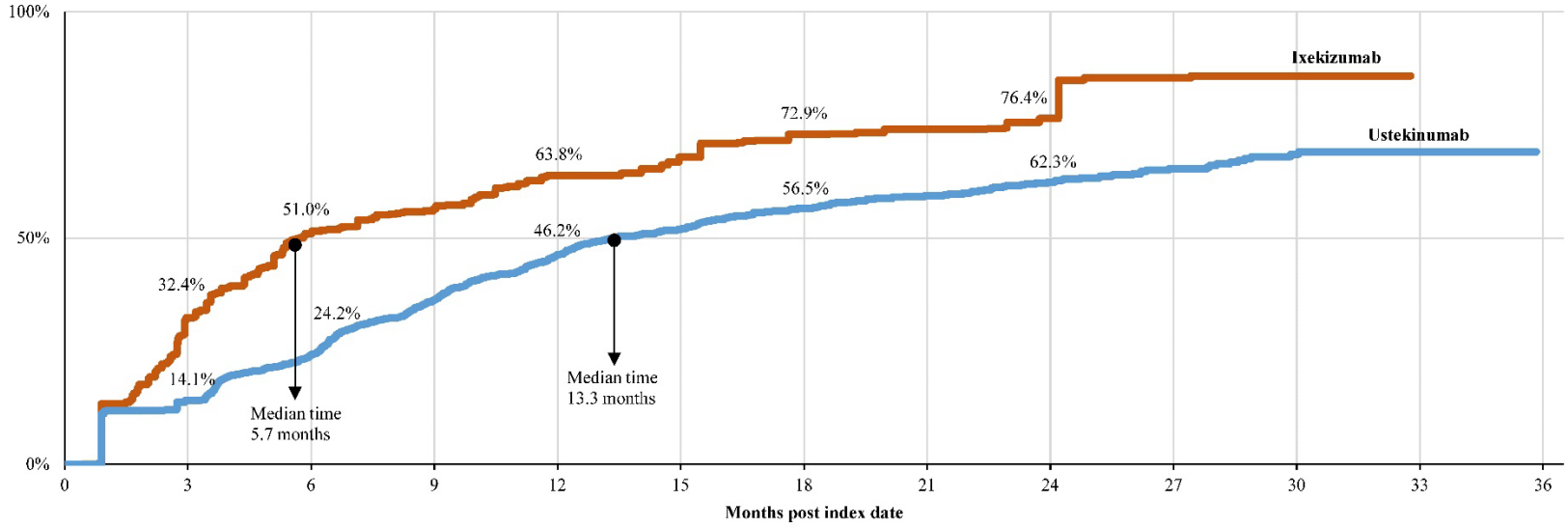
Figure S1. Kaplan-Meier rates of treatment discontinuation based on therapy exposure gap > one time the labelled frequency of administration[1,2,3]

A. Ustekinumab versus adalimumab



Patients at risk[4], n (%)	3 months	6 months	12 months	18 months	24 months
Ustekinumab	1,665 (74.7%)	1,263 (56.6%)	672 (30.1%)	362 (16.2%)	178 (8.0%)
Adalimumab	2,526 (56.3%)	1,442 (32.3%)	469 (10.5%)	204 (4.6%)	85 (1.9%)

B. Ustekinumab versus ixekizumab



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Ixekizumab	311 (58.2%)	199 (37.1%)	105 (19.6%)	53 (10.0%)	33 (6.1%)

Abbreviations: HCPCS = Healthcare Common Procedure Coding System; KM = Kaplan-Meier; NDC = National Drug Code; Quan-CCI = Quan-Charlson Comorbidity Index.

Notes:

1. Results are presented for balanced cohorts.

2. Discontinuation of the index therapy was defined as the presence of a therapy exposure gap between consecutive days of index therapy supply or the last day of supply and the end of the follow-up period.
3. One time therapy exposure gap is defined as time between administrations greater than or equal to the labelled maintenance dosing interval after induction of each index therapy i.e., ustekinumab: >12 weeks (90 days) x 1, secukinumab: >4 weeks (30 days) x 1, adalimumab: >2 weeks (15 days) x 1, ixekizumab: >4 weeks (30 days) x 1.
4. Refers to the population at risk of having the event at that point in time (i.e., patients who have not had the event and have not been lost to follow-up).

Table S1. Patient baseline characteristics – unbalanced cohorts

Mean ± SD [median] or n (%)	Ustekinumab Cohort N = 2,230	Secukinumab Cohort N = 1,807	Std. diff.	Adalimumab Cohort N = 4,483	Std. diff.	Ixekizumab Cohort N = 535	Std. diff.
Age at index date[1] (years)	49.0 ± 14.6 [49.7]	51.6 ± 12.8 [52.4]	19.5%	49.1 ± 13.8 [49.7]	0.8%	53.3 ± 13.5 [52.8]	31.0%
Female	1,099 (49.3)	899 (49.8)	0.9%	2,209 (49.3)	0.0%	236 (44.1)	10.4%
Region of residence at index date[1]							
South	997 (44.7)	914 (50.6)	11.8%	2,090 (46.6)	3.8%	264 (49.3)	9.3%
Midwest	514 (23.0)	398 (22.0)	2.5%	1,245 (27.8)	10.9%	139 (26.0)	6.8%
West	465 (20.9)	335 (18.5)	5.8%	776 (17.3)	9.0%	83 (15.5)	13.9%
Northeast	247 (11.1)	155 (8.6)	8.4%	364 (8.1)	10.1%	47 (8.8)	7.7%
Unknown	7 (0.3)	5 (0.3)	0.7%	8 (0.2)	2.7%	2 (0.4)	1.0%
Insurance type at index date[1]							
Commercial	1,911 (85.7)	1,496 (82.8)	8.0%	3,817 (85.1)	1.6%	413 (77.2)	22.0%
Medicare	319 (14.3)	311 (17.2)	8.0%	666 (14.9)	1.6%	122 (22.8)	22.0%
Year of index date[1]							
2016	457 (20.5)	252 (13.9)	17.4%	686 (15.3)	13.6%	46 (8.6)	34.2%
2017	890 (39.9)	589 (32.6)	15.3%	1,541 (34.4)	11.5%	174 (32.5)	15.4%
2018	608 (27.3)	603 (33.4)	13.3%	1,449 (32.3)	11.1%	158 (29.5)	5.0%
2019	275 (12.3)	363 (20.1)	21.2%	807 (18.0)	15.9%	157 (29.3)	42.8%
Quan-CCI[2]	1.1 ± 1.9 [0.0]	1.2 ± 1.9 [0.0]	9.9%	1.1 ± 1.8 [0.0]	0.1%	1.3 ± 2.1 [0.0]	14.1%
Psoriasis-related conditions	1,700 (76.2)	1,516 (83.9)	19.3%	3,654 (81.5)	12.9%	424 (79.3)	7.3%
Hypertension	861 (38.6)	828 (45.8)	14.6%	1,763 (39.3)	1.5%	246 (46.0)	15.0%
Hyperlipidemia	802 (36.0)	765 (42.3)	13.1%	1,639 (36.6)	1.2%	240 (44.9)	18.2%
Psoriatic arthritis	639 (28.7)	886 (49.0)	42.8%	1,783 (39.8)	23.6%	161 (30.1)	3.2%
Obesity	541 (24.3)	533 (29.5)	11.8%	1,254 (28.0)	8.5%	170 (31.8)	16.8%
Anxiety	386 (17.3)	341 (18.9)	4.1%	775 (17.3)	0.1%	81 (15.1)	5.9%
Diabetes	381 (17.1)	387 (21.4)	11.0%	847 (18.9)	4.7%	129 (24.1)	17.4%
Depression	340 (15.2)	282 (15.6)	1.0%	687 (15.3)	0.2%	68 (12.7)	7.3%
Hypothyroidism	266 (11.9)	291 (16.1)	12.1%	567 (12.6)	2.2%	66 (12.3)	1.3%
Cardiovascular disease	240 (10.8)	239 (13.2)	7.6%	409 (9.1)	5.5%	74 (13.8)	9.4%
Rheumatoid arthritis	181 (8.1)	201 (11.1)	10.2%	554 (12.4)	14.0%	30 (5.6)	9.9%
Peripheral vascular disease	94 (4.2)	86 (4.8)	2.6%	180 (4.0)	1.0%	28 (5.2)	4.8%
Metabolic syndrome	13 (0.6)	18 (1.0)	4.7%	39 (0.9)	3.4%	7 (1.3)	7.5%
Other conditions requiring treatment with index therapies							
Crohn's disease	90 (4.0)	5 (0.3)	26.1%	67 (1.5)	15.5%	3 (0.6)	23.3%
Ulcerative colitis	39 (1.7)	6 (0.3)	14.0%	69 (1.5)	1.6%	1 (0.2)	16.0%
Ankylosing spondylitis	17 (0.8)	39 (2.2)	11.7%	74 (1.7)	8.1%	0 (0.0)	12.4%
Smoking	295 (13.2)	244 (13.5)	0.8%	641 (14.3)	3.1%	90 (16.8)	10.1%
Any psoriasis treatment	1,872 (83.9)	1,564 (86.6)	7.4%	3,664 (81.7)	5.9%	436 (81.5)	6.5%
Topical therapies	1,518 (68.1)	1,128 (62.4)	11.9%	3,082 (68.7)	1.5%	360 (67.3)	1.7%
Conventional systemic therapies	657 (29.5)	584 (32.3)	6.2%	1,535 (34.2)	10.3%	137 (25.6)	8.6%
Apremilast	270 (12.1)	303 (16.8)	13.3%	409 (9.1)	9.7%	57 (10.7)	4.6%

Immunosuppress-ant agents	383 (17.2)	322 (17.8)	1.7%	1,120 (25.0)	19.2%	84 (15.7)	4.0%
Retinoids	48 (2.2)	22 (1.2)	7.3%	87 (1.9)	1.5%	13 (2.4)	1.9%
Biologics-experienced	637 (28.6)	886 (49.0)	43.0%	443 (9.9)	48.8%	217 (40.6)	25.4%
Opioids treatment							
Continuous opioid Treatment[3]	97 (4.3)	146 (8.1)	15.5%	276 (6.2)	8.1%	34 (6.4)	8.9%
Cumulative days of opioid use[4]	21.5 ± 70.3 [0.0]	34.2 ± 88.0 [0.0]	15.9%	27.8 ± 81.1 [0.0]	8.3%	27.9 ± 82.5 [0.0]	8.4%
Time from first observed psoriasis diagnosis to index date (months)	28.3 ± 25.8 [19.0]	35.6 ± 28.7 [25.8]	26.7%	23.3 ± 24.3 [14.5]	20.2%	36.3 ± 29.2 [29.0]	29.1%
All-cause pharmacy and medical costs, PPPY	22,329 ± 30,867 [11,691]	32,319 ± 31,465 [26,014]	32.1%	15,985 ± 26,751 [5,908]	22.0%	30,909 ± 45,404 [19,630]	22.1%
All-cause pharmacy costs	11,562 ± 17,697 [2,919]	21,457 ± 22,951 [15,284]	48.3%	6,656 ± 13,405 [1,122]	31.3%	18,416 ± 22,994 [6,504]	33.4%
All-cause medical costs	10,767 ± 24,811 [2,499]	10,862 ± 20,532 [3,155]	0.4%	9,329 ± 21,509 [2,603]	6.2%	12,493 ± 35,489 [2,845]	5.6%

Abbreviations: IL = interleukin; PPPY = per patient per year; Quan-CCI = Quan-Charlson Comorbidity Index; SD = standard deviation; Std. diff. = standardized difference; TNF = tumor necrosis factor

Notes:

1. The index date was defined as the first observed claim for ustekinumab, adalimumab, secukinumab, or ixekizumab dated on or after 07/01/2016. Patients initiating more than one agent on the index date were excluded.
2. Quan H, Sundararajan V, Halfon P et al. Coding Algorithms for Defining Comorbidities in ICD-10-CM Administrative Data. Medical Care 2005;43:1130-1139.
3. A continuous opioid treatment episode is defined as the absence of a gap of > 7 days in any opioid supply, based on the days of supply in pharmacy claims, within a duration of ≥3 months.
4. Cumulative days of opioid use is calculated as a sum of days of supply in opioid pharmacy claims during the 12 months baseline period