

SUPPLEMENTARY MATERIAL

Incidence rates of infections, malignancies, thromboembolisms, and cardiovascular events in an alopecia areata cohort from a US claims database

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Table S1. Incidence Proportions and Incidence Rates per 1000 Person-Years for Outcome Events of Interest in the AA and Matched Non-AA Cohorts

Outcome Events	AA cohort (n=8784) ^a		Non-AA cohort (n=26,352) ^a	
	n (IP)	IR (95% CI)	n (IP)	IR (95% CI)
Serious infection requiring hospitalization	281 (3.2)	18.5 (16.5-20.8)	1238 (4.7)	20.6 (19.5-21.8)
Herpes zoster infection	119 (1.4)	7.8 (6.5-9.3)	463 (1.8)	7.6 (6.9-8.3)
Herpes simplex infection	294 (3.3)	19.5 (17.4-21.8)	592 (2.2)	9.7 (9.0-10.5)
Any primary malignancy ^b	181 (2.2)	12.5 (10.8-14.5)	680 (2.7)	11.6 (10.8-12.6)
BCC	118 (1.4)	7.8 (6.5-9.4)	382 (1.5)	6.3 (5.7-7.0)
SCC	79 (0.9)	5.2 (4.2-6.5)	246 (0.9)	4.0 (3.6-4.6)
Malignant melanoma	22 (0.3)	1.4 (0.9-2.2)	58 (0.2)	0.9 (0.7-1.2)
Lymphoma	19 (0.2)	1.2 (0.8-1.9)	46 (0.2)	0.8 (0.6-1.0)
Female breast cancer	39 (0.8)	4.6 (3.3-6.3)	161 (1.1)	4.7 (4.0-5.5)
Cervical carcinoma in situ	8 (0.1)	0.5 (0.3-1.0)	23 (0.1)	0.4 (0.3-0.6)

MACE	234 (2.8)	16.0 (14.1-18.2)	1052 (4.1)	18.1 (17.0-19.2)
Cardiovascular death	23 (0.3)	1.5 (1.0-2.2)	169 (0.6)	2.7 (2.4-3.2)
Acute MI	46 (0.5)	3.0 (2.2-4.0)	294 (1.1)	4.8 (4.3-5.4)
Unstable angina	18 (0.2)	1.2 (0.7-1.9)	115 (0.4)	1.9 (1.6-2.2)
Ischemic stroke	131 (1.5)	8.7 (7.3-10.3)	478 (1.8)	7.9 (7.2-8.7)
Hemorrhagic stroke	36 (0.4)	2.3 (1.7-3.2)	102 (0.4)	1.7 (1.4-2.0)
Hospitalization due to heart failure	74 (0.9)	4.8 (3.9-6.1)	432 (1.7)	7.1 (6.5-7.8)
Coronary revascularization by PCI or CABG	45 (0.5)	2.9 (2.2-3.9)	273 (1.0)	4.5 (4.0-5.1)
DVT	46 (0.5)	3.0 (2.3-4.0)	245 (0.9)	4.0 (3.5-4.5)
PE	30 (0.3)	2.0 (1.4-2.8)	137 (0.5)	2.2 (1.9-2.6)
DVT or PE	65 (0.7)	4.3 (3.3-5.4)	329 (1.3)	5.4 (4.9-6.0)
ATE	13 (0.1)	0.8 (0.5-1.5)	57 (0.2)	0.9 (0.7-1.2)
DVT or PE or ATE	74 (0.9)	4.9 (3.9-6.1)	370 (1.4)	6.1 (5.5-6.7)
All-cause death	64 (0.7)	4.1 (3.2-5.3)	469 (1.8)	7.6 (6.9-8.3)

^a The total number of patients at risk (i.e. denominator) differed depending on whether the outcome event was chronic or acute.

Therefore, the denominator was not always 8784 for the AA cohort or 26,352 for the non-AA cohort.

^b Excluding nonmelanoma skin cancer.

AA, alopecia areata; ATE, arterial thromboembolism; BCC, basal cell carcinoma; CABG, coronary artery bypass graft; DVT, deep vein thrombosis; IP, incidence proportion; IR, incidence rate; MACE, major adverse cardiovascular event; MI, myocardial infarction; PCI, percutaneous coronary intervention; PE, pulmonary embolism SCC, squamous cell carcinoma.

Table S2. Incidence Proportions and Incidence Rates per 1000 Person-Years for Outcome Events of Interest in the AA and Matched Non-AA Cohorts, ages 12-17 years

Outcome Events	AA cohort (n=398) ^a		Non-AA cohort (n=1194) ^a	
	n (IP)	IR (95% CI)	n (IP)	IR (95% CI)
Serious infection requiring hospitalization	2 (0.5)	2.6 (0.6-10.3)	6 (0.5)	2.2 (1.0-4.9)
Herpes zoster infection	0	0	2 (0.2)	0.7 (0.2-2.9)
Herpes simplex infection	5 (1.3)	6.5 (2.7-15.6)	19 (1.6)	7.0 (4.5-11.0)
Any primary malignancy ^b	0	0	2 (0.2)	0.7 (0.2-2.9)
BCC	0	0	1 (0.08)	0.4 (0.05-2.6)
SCC	0	0	0	0
Malignant melanoma	0	0	0	0
Lymphoma	0	0	0	0
Female breast cancer	0	0	0	0
Cervical carcinoma in situ	0	0	0	0

MACE	1 (0.3)	1.3 (0.2-9.1)	1 (0.08)	0.4 (0.05-2.6)
Cardiovascular death	0	0	0	0
Acute MI	0	0	0	0
Unstable angina	0	0	0	0
Ischemic stroke	1 (0.3)	1.3 (0.2-9.1)	1 (0.08)	0.4 (0.05-2.6)
Hemorrhagic stroke	0	0	0	0
Hospitalization due to heart failure	0	0	0	0
Coronary revascularization by PCI or CABG	0	0	0	0
DVT	0	0	0	0
PE	0	0	0	0
DVT or PE	0	0	0	0
ATE	0	0	0	0
DVT or PE or ATE	0	0	0	0
All-cause death	1 (0.3)	1.3 (0.2-9.1)	1 (0.08)	0.4 (0.05-2.6)

^a The total number of patients at risk (i.e., denominator) differed depending on whether the outcome event was chronic or acute.

Therefore, the denominator was not always 398 for the AA cohort and 1194 for the non-AA cohort.

^b Excluding nonmelanoma skin cancer.

AA, alopecia areata; AT, alopecia totalis; ATE, arterial thromboembolism; AU, alopecia universalis; BCC, basal cell carcinoma;

CABG, coronary artery bypass graft; DVT, deep vein thrombosis; IP, incidence proportion; IR, incidence rate; MACE, major adverse cardiovascular event; MI, myocardial infarction; PCI, percutaneous coronary intervention; PE, pulmonary embolism SCC, squamous cell carcinoma.

Table S3. Incidence Proportions and Incidence Rates per 1000 Person-Years for Outcome Events of Interest in the AA and Matched Non-AA Cohorts, ages 18-50 years

Outcome Events	AA cohort (n=5083) ^a		Non-AA cohort (n=15,249) ^a	
	n (IP)	IR (95% CI)	n (IP)	IR (95% CI)
Serious infection requiring hospitalization	59 (1.1)	7.1 (5.5-9.2)	224 (1.5)	6.8 (6.0-7.8)
Herpes zoster infection	36 (0.7)	4.3 (3.1-6.0)	136 (0.9)	4.1 (3.5-4.9)
Herpes simplex infection	169 (3.3)	20.7 (17.8-24.1)	346 (2.3)	10.6 (9.5-11.8)
Any primary malignancy ^b	44 (0.9)	5.4 (4.0-7.2)	114 (0.8)	3.5 (2.9-4.2)
BCC	24 (0.5)	2.9 (1.9-4.3)	64 (0.4)	1.9 (1.5-2.5)
SCC	5 (0.1)	0.6 (0.3-1.4)	14 (0.09)	0.4 (0.3-0.7)
Malignant melanoma	6 (0.1)	0.7 (0.3-1.6)	9 (0.06)	0.3 (0.1-0.5)
Lymphoma	9 (0.2)	1.1 (0.6-2.1)	9 (0.06)	0.3 (0.1-0.5)
Female breast cancer	7 (0.3)	1.9 (0.9-4.0)	30 (0.4)	2.0 (1.4-2.9)
Cervical carcinoma in situ	7 (0.1)	0.8 (0.4-1.8)	18 (0.1)	0.5 (0.3-0.9)

MACE	41 (0.8)	5.0 (3.7-6.8)	130 (0.9)	4.0 (3.3-4.7)
Cardiovascular death	0	0	2 (0.01)	0.06 (0.02-0.2)
Acute MI	6 (0.1)	0.7 (0.3-1.6)	34 (0.2)	1.0 (0.7-1.44)
Unstable angina	1 (0.02)	0.1 (0.02-0.9)	19 (0.1)	0.6 (0.4-0.9)
Ischemic stroke	30 (0.6)	3.6 (2.5-5.2)	57 (0.4)	1.7 (1.3-2.2)
Hemorrhagic stroke	7 (0.1)	0.8 (0.4-1.8)	17 (0.1)	0.5 (0.3-0.8)
Hospitalization due to heart failure	3 (0.06)	0.4 (0.1-1.1)	19 (0.1)	0.6 (0.4-0.9)
Coronary revascularization by PCI or CABG	5 (0.1)	0.6 (0.3-1.4)	31 (0.2)	0.9 (0.7-1.3)
DVT	11 (0.2)	1.3 (0.7-2.4)	56 (0.4)	1.7 (1.3-2.2)
PE	12 (0.2)	1.4 (0.8-2.5)	32 (0.2)	1.0 (0.7-1.4)
DVT or PE	19 (0.4)	2.3 (1.5-3.6)	76 (0.5)	2.3 (1.9-2.9)
ATE	1 (0.02)	0.1 (0.02-0.9)	10 (0.07)	0.3 (0.2-0.6)
DVT or PE or ATE	20 (0.4)	2.4 (1.6-3.7)	83 (0.5)	2.5 (2.0-3.1)
All-cause death	2 (0.04)	0.2 (0.06-1.0)	21 (0.1)	0.6 (0.4-1.0)

^a The total number of patients at risk (i.e., denominator) differed depending on whether the outcome event was chronic or acute.

Therefore, the denominator was not always 5083 for the AA cohort and 15,249 for the non-AA cohort.

^b Excluding nonmelanoma skin cancer.

AA, alopecia areata; AT, alopecia totalis; ATE, arterial thromboembolism; AU, alopecia universalis; BCC, basal cell carcinoma;

CABG, coronary artery bypass graft; DVT, deep vein thrombosis; IP, incidence proportion; IR, incidence rate; MACE, major adverse cardiovascular event; MI, myocardial infarction; PCI, percutaneous coronary intervention; PE, pulmonary embolism SCC, squamous cell carcinoma.

Table S4. Incidence Proportions and Incidence Rates per 1000 Person-Years for Outcome Events of Interest in the AA and Matched Non-AA Cohorts, ages ≥51 years

Outcome Events	AA cohort (n=3303) ^a		Non-AA cohort (n=9909) ^a	
	n (IP)	IR (95% CI)	n (IP)	IR (95% CI)
Serious infection requiring hospitalization	220 (6.7)	36.0 (31.6-41.1)	1008 (10.2)	41.1 (38.6-43.7)
Herpes zoster infection	83 (2.5)	13.3 (10.7-16.5)	325 (3.3)	12.8 (11.5-14.3)
Herpes simplex infection	120 (3.6)	19.4 (16.2-23.2)	227 (2.3)	8.9 (7.8-10.1)
Any primary malignancy ^b	137 (4.7)	24.9 (21.0-29.4)	564 (6.2)	24.5 (22.6-26.6)
BCC	94 (3.0)	15.8 (12.9-19.3)	317 (3.3)	12.8 (11.4-14.2)
SCC	74 (2.3)	12.1 (9.7-15.2)	232 (2.4)	9.2 (8.1-10.4)
Malignant melanoma	16 (0.5)	2.5 (1.6-4.1)	49 (0.5)	1.9 (1.4-2.5)
Lymphoma	10 (0.3)	1.6 (0.9-2.9)	37 (0.4)	1.4 (1.0-2.0)
Female breast cancer	32 (1.4)	7.2 (5.1-10.2)	131 (1.9)	7.2 (6.0-8.5)
Cervical carcinoma in situ	1 (0.03)	0.2 (0.02-1.1)	5 (0.05)	0.2 (0.08-0.5)

MACE	192 (6.4)	34.5 (29.9-39.7)	921 (10.0)	40.4 (37.9-43.1)
Cardiovascular death	23 (0.7)	3.6 (2.4-5.4)	167 (1.7)	6.4 (5.5-7.5)
Acute MI	40 (1.2)	6.4 (4.7-8.8)	260 (2.6)	10.3 (9.1-11.6)
Unstable angina	17 (0.5)	2.7 (1.7-4.3)	96 (1.0)	3.7 (3.1-4.6)
Ischemic stroke	100 (3.2)	16.7 (13.7-20.3)	420 (4.4)	17.0 (15.5-18.7)
Hemorrhagic stroke	29 (0.8)	4.6 (3.2-6.6)	85 (0.9)	3.3 (2.7-4.1)
Hospitalization due to heart failure	71 (2.2)	11.5 (9.1-14.6)	413 (4.2)	16.5 (15.0-18.2)
Coronary revascularization by PCI or CABG	40 (1.2)	6.5 (4.8-8.9)	242 (2.5)	9.8 (8.6-11.1)
DVT	35 (1.1)	5.7 (4.1-7.9)	189 (1.9)	7.4 (6.4-8.6)
PE	18 (0.5)	2.9 (1.8-4.6)	105 (1.1)	4.1 (3.4-5.0)
DVT or PE	46 (1.4)	7.5 (5.6-10.0)	253 (2.6)	10.0 (8.9-11.3)
ATE	12 (0.4)	1.9 (1.1-3.3)	47 (0.5)	1.8 (1.4-2.4)
DVT or PE or ATE	54 (1.7)	8.8 (6.8-11.5)	287 (2.9)	11.4 (10.2-12.8)
All-cause death	61 (1.8)	9.6 (7.5-12.3)	447 (4.5)	17.2 (15.7-18.9)

^a The total number of patients at risk (i.e., denominator) differed depending on whether the outcome event was chronic or acute.

Therefore, the denominator was not always 3303 for the AA cohort and 9909 for the non-AA cohort.

^b Excluding nonmelanoma skin cancer.

AA, alopecia areata; AT, alopecia totalis; ATE, arterial thromboembolism; AU, alopecia universalis; BCC, basal cell carcinoma;

CABG, coronary artery bypass graft; DVT, deep vein thrombosis; IP, incidence proportion; IR, incidence rate; MACE, major adverse cardiovascular event; MI, myocardial infarction; PCI, percutaneous coronary intervention; PE, pulmonary embolism SCC, squamous cell carcinoma.

Table S5. Incidence Proportion and Incidence Rates per 1000 Person-Years for Outcome Events of Interest in Patients With AT/AU and Non-AT/AU AA

Outcome Events	AA cohort AT/AU subtype (n=599) ^a		AA cohort non-AT/AU subtype (n=8185) ^a	
	n (IP)	IR (95% CI)	n (IP)	IR (95% CI)
	Serious infection requiring hospitalization	48 (8.0)	43.3 (32.6-57.4)	233 (2.8)
Herpes zoster infection	12 (2.0)	10.4 (5.9-18.3)	107 (1.3)	7.5 (6.2-9.1)
Herpes simplex infection	25 (4.2)	22.1 (14.9-32.6)	269 (3.3)	19.3 (17.1-21.7)
Any primary malignancy ^b	18 (3.3)	17.3 (10.9-27.5)	163 (2.0)	12.1 (10.4-14.2)
BCC	11 (1.9)	9.7 (5.4-17.4)	107 (1.3)	7.7 (6.4-9.3)
SCC	11 (1.9)	9.7 (5.4-17.6)	68 (0.8)	4.8 (3.8-6.1)
Malignant melanoma	2 (0.3)	1.7 (0.4-6.9)	20 (0.2)	1.4 (0.9-2.2)
Lymphoma	2 (0.3)	1.7 (0.4-6.9)	17 (0.2)	1.2 (0.7-1.9)

Female breast cancer	3 (0.7)	3.8 (1.2-11.8)	36 (0.8)	4.6 (3.4-6.4)
Cervical carcinoma in situ	0 (0)	0 (0)	8 (0.1)	0.6 (0.3-1.1)
MACE	34 (6.1)	32.3 (23.1-45.2)	200 (2.5)	14.8 (12.9-17.0)
Cardiovascular death	1 (0.2)	0.9 (0.1-6.1)	22 (0.3)	1.5 (1.0-2.3)
Acute MI	12 (2.0)	10.4 (5.9-18.3)	51 (0.6)	3.6 (2.7-4.7)
Unstable angina	1 (0.2)	0.9 (0.1-6.1)	19 (0.2)	1.3 (0.9-2.1)
Ischemic stroke	17 (2.9)	15.2 (9.5-24.5)	114 (1.4)	8.2 (6.8-9.8)
Hemorrhagic stroke	2 (0.3)	1.7 (0.4-6.9)	34 (0.4)	2.4 (1.7-3.3)
Hospitalization due to heart failure	18 (3.0)	15.6 (9.8-24.8)	95 (1.2)	6.7 (5.5-8.2)
Coronary revascularization by PCI or CABG	10 (1.7)	8.6 (4.7-16.1)	77 (0.9)	5.4 (4.3-6.8)
DVT	9 (1.5)	7.9 (4.1-15.2)	37 (0.5)	2.6 (1.9-3.6)
PE	9 (1.5)	7.8 (4.1-15.0)	21 (0.3)	1.5 (1.0-2.3)
DVT or PE	16 (2.7)	14.2 (8.7-23.2)	49 (0.6)	3.5 (2.6-4.6)
ATE	3 (0.5)	2.6 (0.8-8.0)	10 (0.1)	0.7 (0.4-1.3)

DVT or PE or ATE	18 (3.0)	16.1 (10.1-25.5)	56 (0.7)	4.0 (3.1-5.2)
All-cause death	9 (1.5)	7.7 (4.0-14.8)	55 (0.7)	3.8 (2.9-5.0)

^a The total number of patients at risk (i.e., denominator) differed depending on whether the outcome event was chronic or acute.

Therefore, the denominator was not always 599 for the AT/AU subtype or 8185 for the non-AT/AU subtype cohort.

^b Excluding nonmelanoma skin cancer.

AA, alopecia areata; AT, alopecia totalis; ATE, arterial thromboembolism; AU, alopecia universalis; BCC, basal cell carcinoma;

CABG, coronary artery bypass graft; DVT, deep vein thrombosis; IP, incidence proportion; IR, incidence rate; MACE, major adverse cardiovascular event; MI, myocardial infarction; PCI, percutaneous coronary intervention; PE, pulmonary embolism SCC, squamous cell carcinoma.