Association of psoriasis with inflammatory bowel disease: a systematic review and meta-analysis of observational studies

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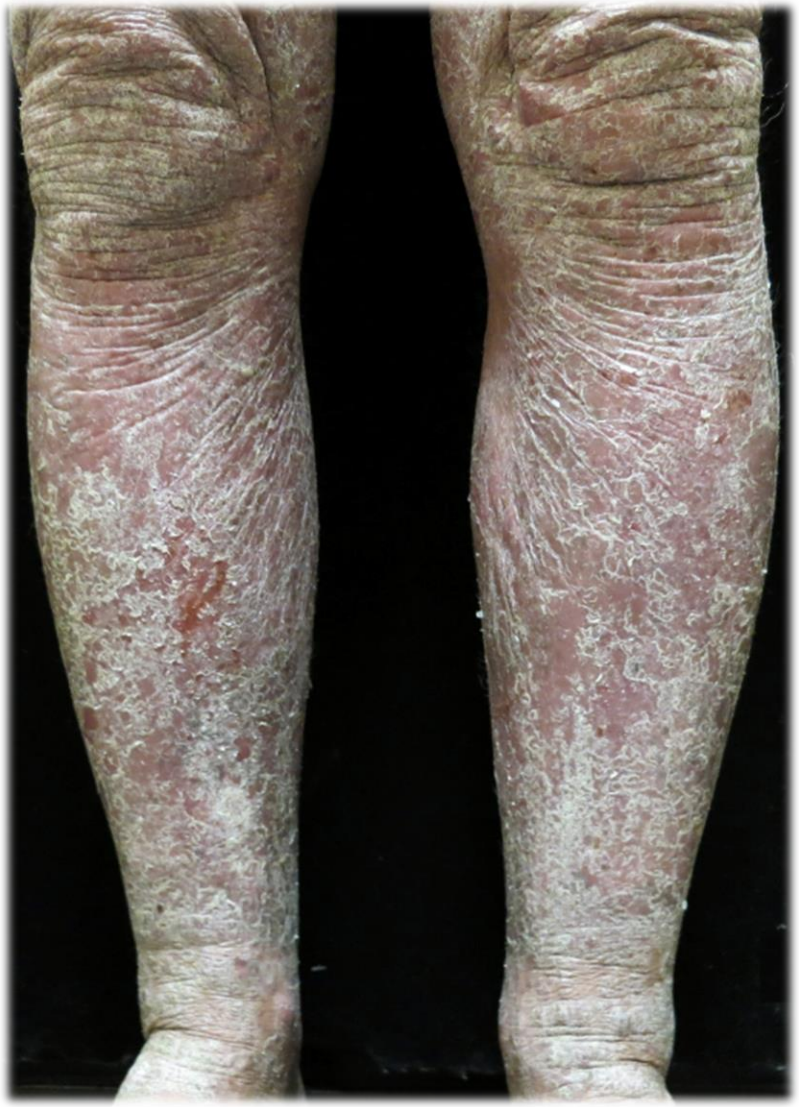
Introduction

- Psoriasis is a chronic immune-mediated dermatosis.
- Psoriasis affect 0.5–11.4% of adults and 1.4% of children worldwide.
- Psoriasis presents with sharply demarcated erythematous scaling plaques.
- The clinical course is relapsing and remitting.
- Genetic and environmental factors are involved in the etiology of psoriasis.



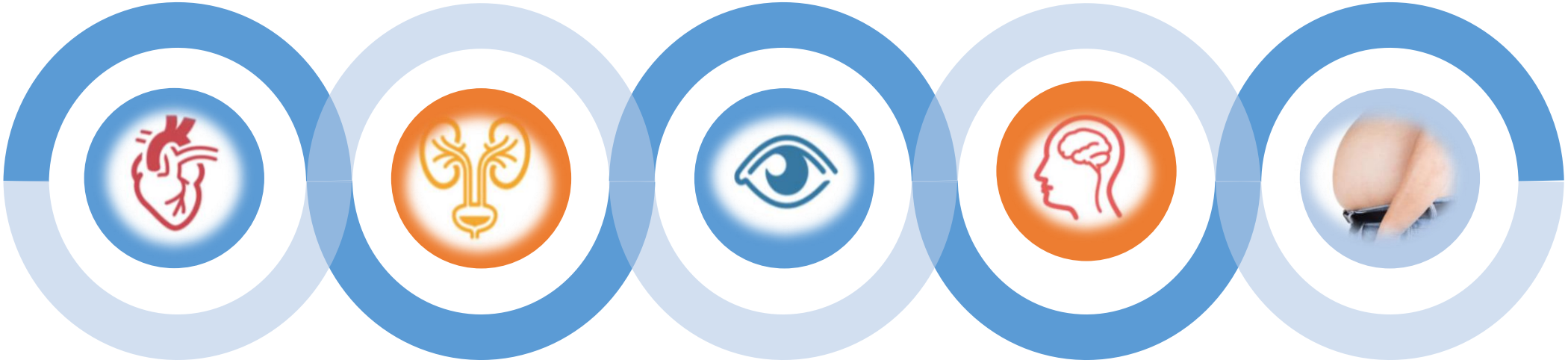
Introduction

Psoriasis has been linked with various comorbidities

Cardiovascular diseases

Uveitis

Metabolic syndrome



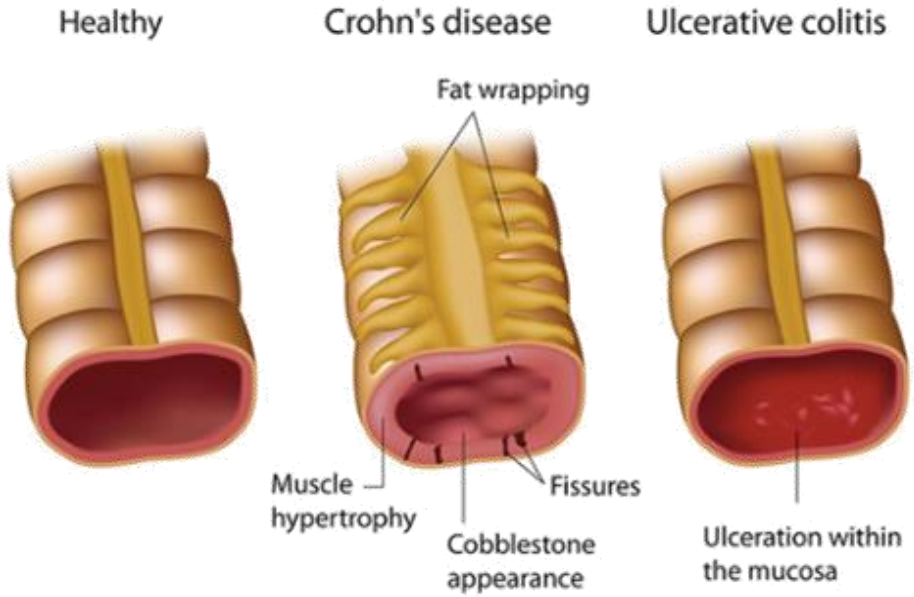
Renal disease

Psychiatric disorders

http://www.lanimg.com/wangye/201510/690846.html

Introduction

- Inflammatory bowel disease (IBD) is a chronic relapsing inflammatory disease of the gastrointestinal tract.
- Crohns disease (CD) and ulcerative colitis (UC) are the two main forms of IBD.
- CD causes the infiltration and destruction of all intestinal wall layers along the digestive tract.
- UC involves the colon and rectum with mucosal and submucosal invasion.

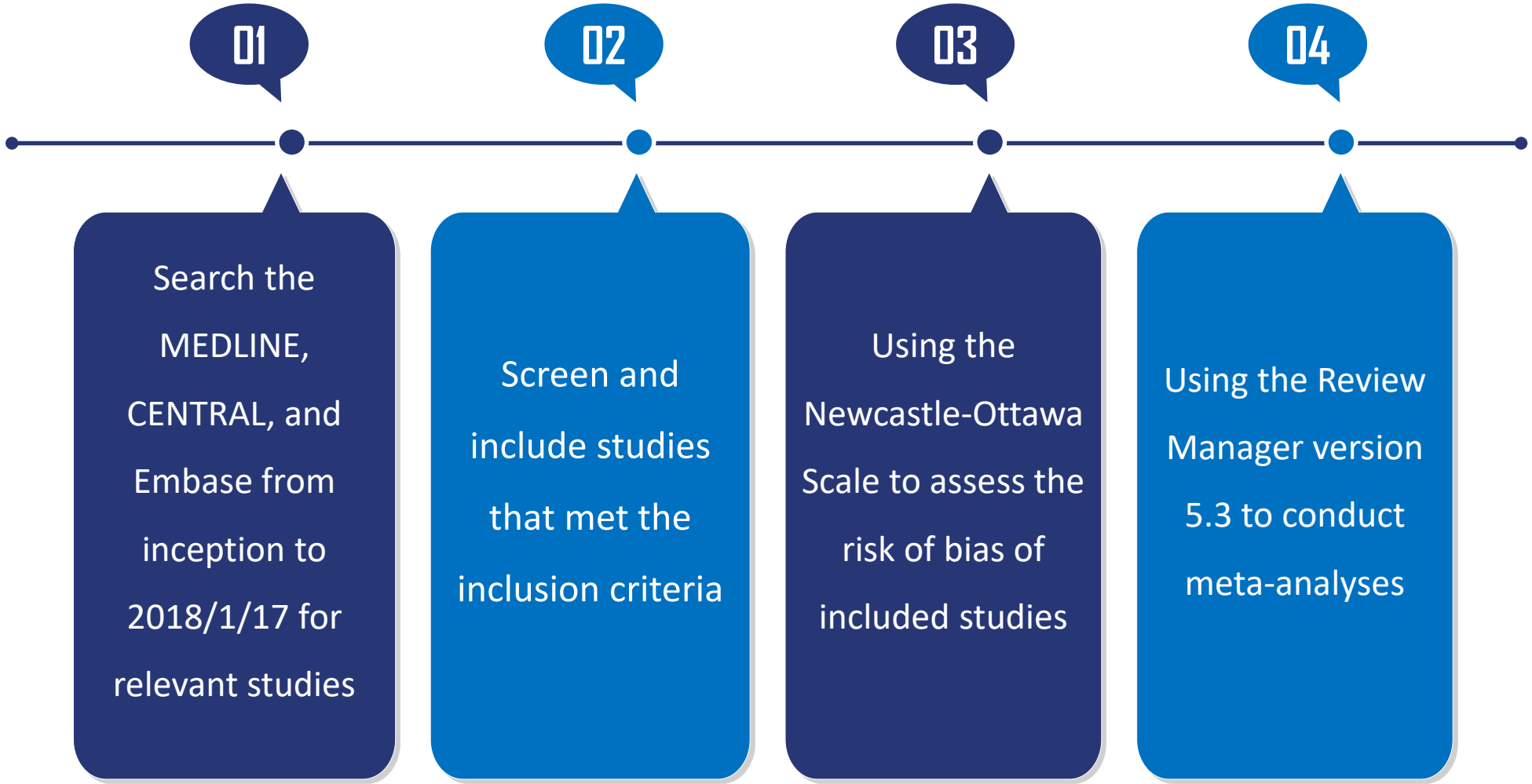


Patients with IBD often experience recurrent loss of appetite, vomiting, diarrhea, abdominal pain, rectal bleeding, and body weight loss.

Introduction

- Previous studies have shown common genotype, clinical course, and immunological features shared by psoriasis and IBD.
- However, the relationship between psoriasis and IBD was largely unclear.
- Therefore we conducted a systemic review and meta-analysis of observational studies on the association of psoriasis with IBD.

Methods


01
Search the MEDLINE, CENTRAL, and Embase from inception to 2018/1/17 for relevant studies
02
Screen and include studies that met the inclusion criteria
03
Using the Newcastle-Ottawa Scale to assess the risk of bias of included studies
04
Using the Review Manager version 5.3 to conduct meta-analyses

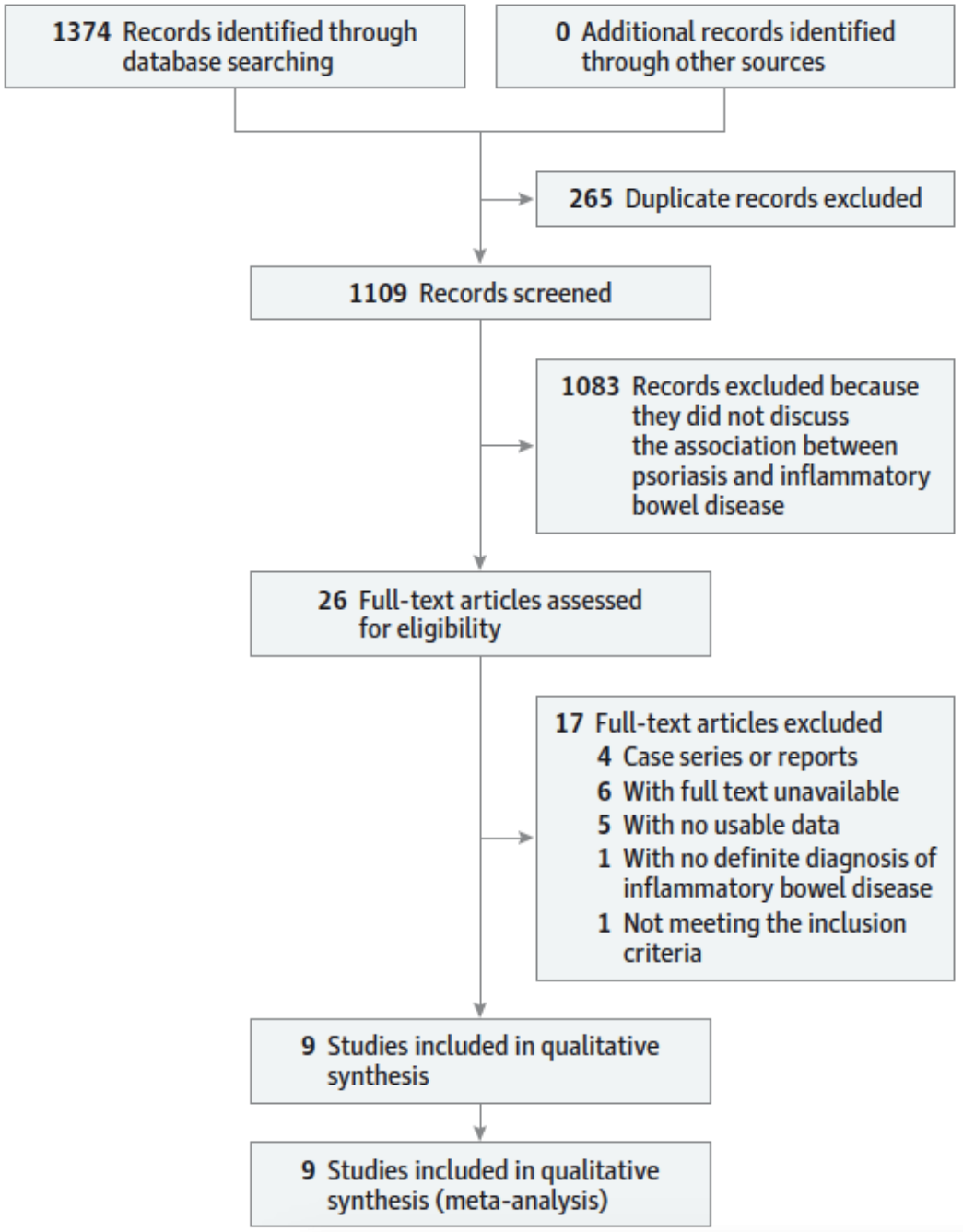
Inclusion criteria

1. Observational studies examining the association of psoriasis with IBD, including cross-sectional, case-control, or cohort studies.

2. The case group was composed of psoriatic patients, while the control group was composed of subjects without psoriasis.

Results

PRISMA study flow chart



Results : Case-control / Cross-sectional studies

Table 1. Characteristics of Included Case-Control and Cross-Sectional Studies

Source	Study Design	Case Group	Control Group	OR (95% CI)	
				Crohn Disease	Ulcerative Colitis
Cohen et al,[37] 2009	Case-control	12 502 Patients with psoriasis (6516 males and 5986 females)	24 285 Age- and sex-matched controls (12 197 males and 12 088 females)	2.49 (1.71-3.62)	1.64 (1.15-2.33)
Tsai et al,[39] 2011	Case-control	51 800 Patients with psoriasis (31 923 males and 19 877 females)	207 200 Controls matched for age, sex, and urbanization level of residential area	0.70 (0.52-0.94)	NA
Augustin et al,[38] 2010	Cross-sectional	33 981 Patients with psoriasis	1 310 090 Healthy controls	2.06 (1.83-2.31)	1.95 (1.76-2.17)
Zohar et al,[43] 2016	Case-control	3161 Patients with psoriatic arthritis	31 610 Age- and sex-matched randomly selected patients	2.20 (1.59-3.03)	1.91 (1.21-3.00)
Wu et al,[40] 2012	Case-control	25 341 Patients with ≥2 diagnosis codes for any psoriatic disease	126 705 Controls matched for age, sex, and length of enrollment	1.8 (1.5-2.2)	1.5 (1.3-1.8)

Results : Cohort studies

Table 2. Characteristics of Included Cohort Studies

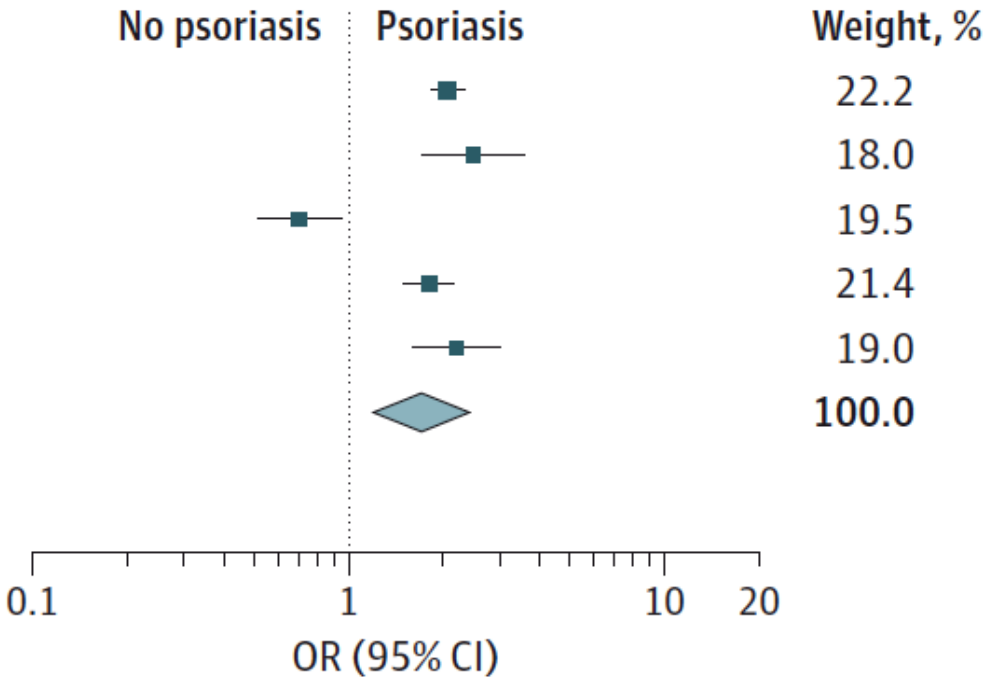
Source	Study Design	Exposed Group	Control Group	RR (95% CI)	
				Crohn Disease	Ulcerative Colitis
Egeberg et al,[42] 2016	Cohort study	75 209 Patients with psoriasis (36 212 males and 38 997 females)	5 478 891 Individuals in the reference population	1.94 (1.66-2.26)	1.72 (1.56-1.90)
Charlton et al,[45] 2018	Cohort study	6783 Patients with psoriatic arthritis	27 132 Individuals in the general population	2.96 (1.46-6.00)	1.30 (0.66-2.56)
Li et al,[41] 2013	Cohort study	2755 Women with psoriasis	171 721 Women without psoriasis	3.86 (2.23-6.67)	1.17 (0.41-3.36)
Manos et al,[44] 2017	Cohort study	1012 Children with psoriatic arthritis	203 907 Controls matched for age, sex, and date of psoriasis or psoriatic arthritis diagnosis	1.50 (0.21-10.68)	3.45 (0.86-13.90)

Association of psoriasis with CD : Case-control studies

Except for the Tsai 2011 study, all the other four case-control studies demonstrated an increased odds of CD in relation to psoriasis.

A Case-control studies on the association of psoriasis with Crohn disease

Study or Subgroup	Log (OR)	SE	OR (95% CI)
Augustin et al,[38] 2010	0.7211	0.0583	2.06 (1.83-2.31)
Cohen et al,[37] 2009	0.9115	0.1913	2.49 (1.71-3.62)
Tsai et al,[39] 2011	-0.3591	0.1518	0.70 (0.52-0.94)
Wu et al,[40] 2012	0.5878	0.0930	1.80 (1.50-2.16)
Zohare al,[43] 2016	0.7875	0.1638	2.20 (1.59-3.03)
Total			**1.70 (1.20-2.40)**
Heterogeneity: $\tau^2 = 0.14$; $\chi^2 = 48.09$; $P < .001$; $I^2 = 92\%$			
Test for overall effect: $z = 2.98$; $P = .003$			

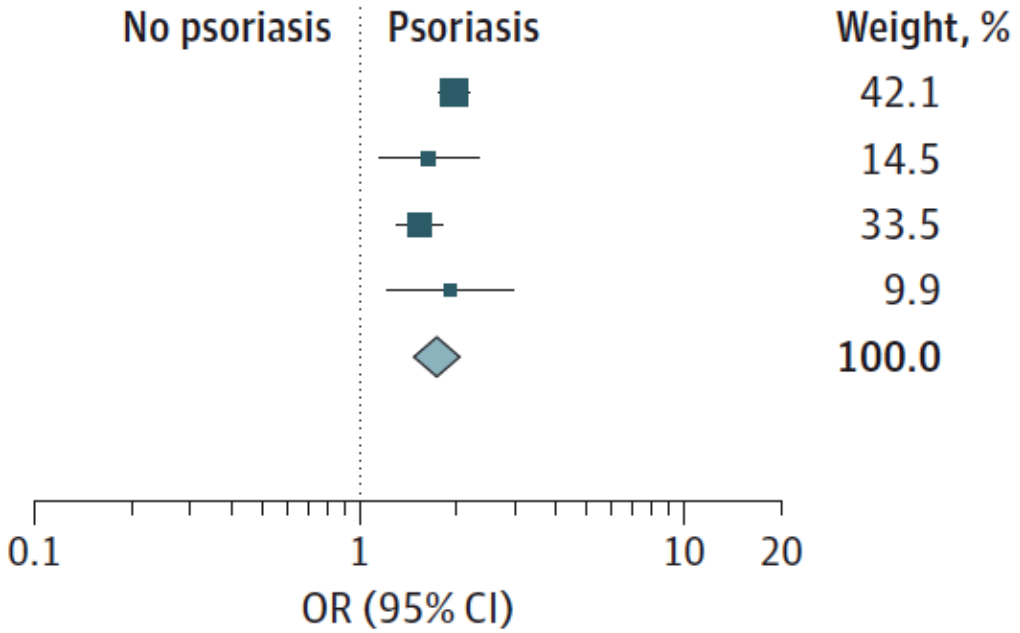


Association of psoriasis with UC : Case-control studies

Four included case-control studies provided data regarding the association of psoriasis with UC.

B Case-control studies on the association of psoriasis with ulcerative colitis

Study or Subgroup	Log (OR)	SE	OR (95% CI)
Augustin et al,[38] 2010	0.6702	0.0536	1.95 (1.76-2.17)
Cohen et al,[37] 2009	0.4928	0.1801	1.64 (1.15-2.33)
Wu et al,[40] 2012	0.4251	0.0830	1.53 (1.30-1.80)
Zohare al,[43] 2016	0.6446	0.2316	1.91 (1.21-3.00)
Total			**1.75 (1.49-2.05)**
Heterogeneity: $\tau^2 = 0.01$; $\chi^2 = 6.53$; $P = .09$; $I^2 = 54\%$			
Test for overall effect: $z = 6.92$; $P < .001$			

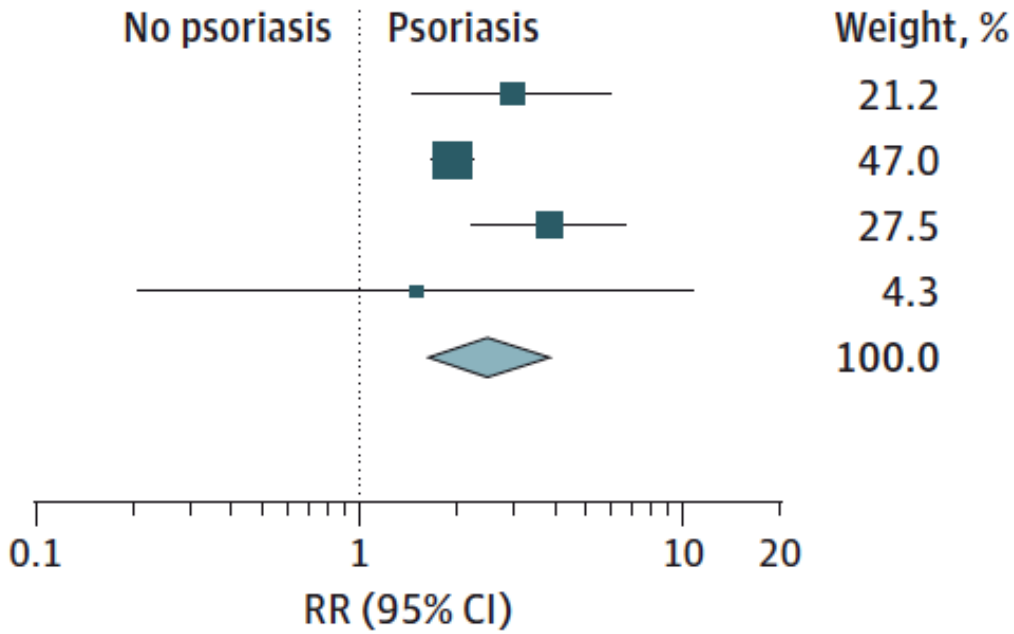


Association of psoriasis with CD : Cohort studies

All four included cohort studies illustrated increased risk of CD in patients with psoriasis.

C Cohort studies on the association of psoriasis with Crohn disease

Study or Subgroup	Log (RR)	SE	RR (95% CI)
Charlton et al,[45] 2018	1.0851	0.3605	2.96 (1.46-6.00)
Egeberg et al,[42] 2016	0.6617	0.0790	1.94 (1.66-2.26)
Li et al,[41] 2013	1.3498	0.2795	3.86 (2.23-6.67)
Manos al,[44] 2017	0.4055	1.0015	1.50 (0.21-10.68)
Total			2.53 (1.65-3.89)
Heterogeneity: $\tau^2 = 0.10$; $\chi^2 = 6.74$; $P = .08$; $I^2 = 55\%$			
Test for overall effect: $z = 4.26$; $P < .001$			

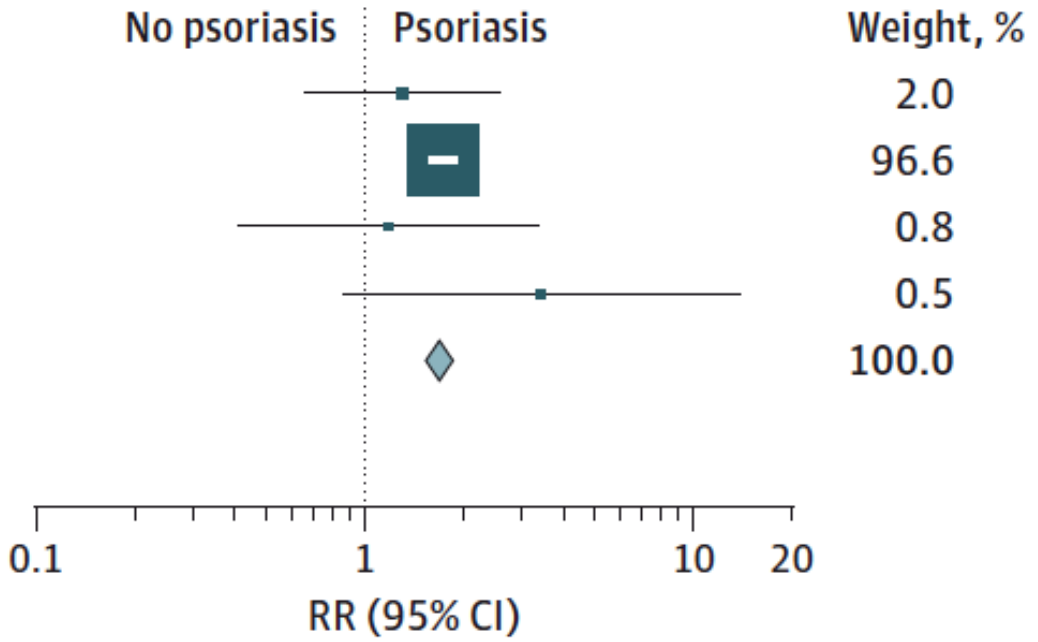


Association of psoriasis with UC : Cohort studies

One included cohort study showed significantly increased risk of UC in patients with psoriasis, while the other three did not.

D Cohort studies on the association of psoriasis with ulcerative colitis

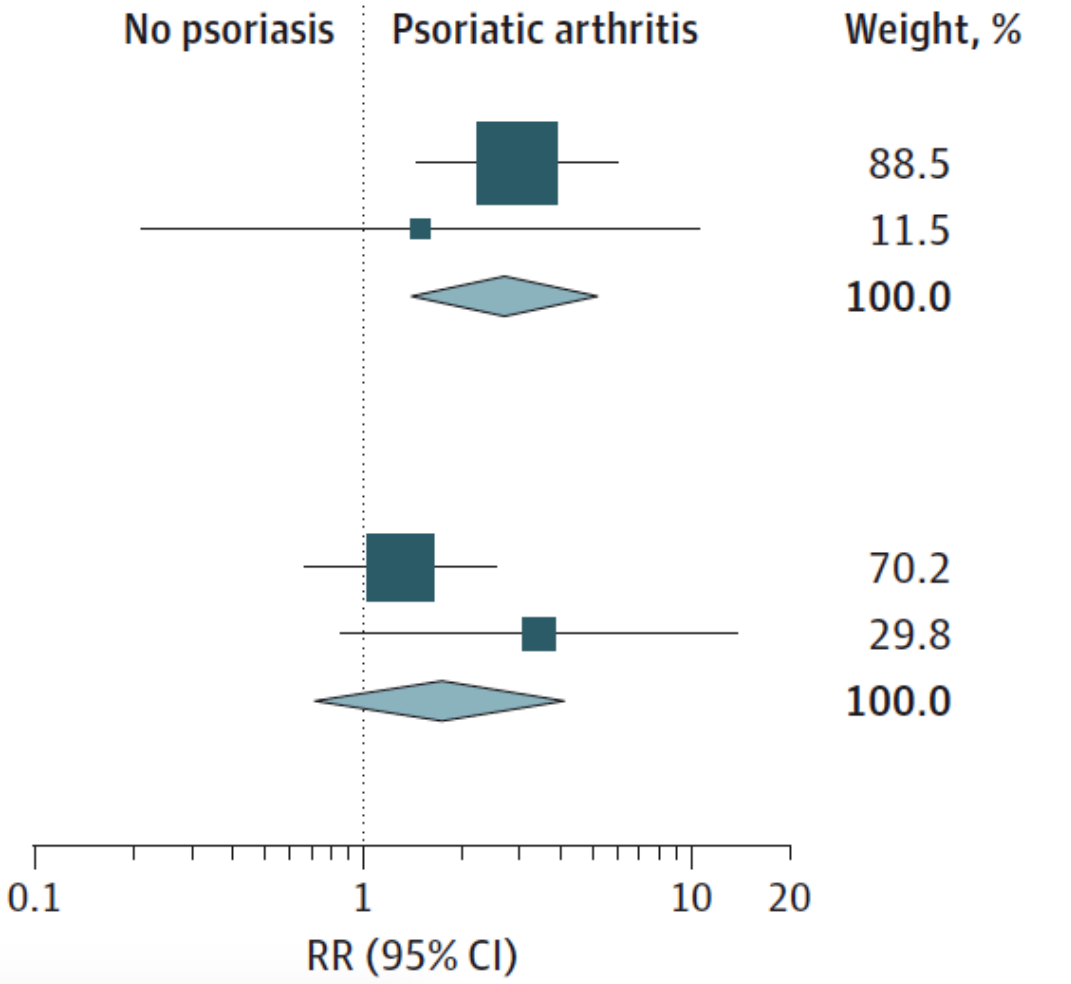
Study or Subgroup	Log (RR)	SE	RR (95% CI)
Charlton et al,[45] 2018	0.2622	0.3458	1.30 (0.66-2.56)
Egeberg et al,[42] 2016	0.5433	0.0503	1.72 (1.56-1.90)
Li et al,[41] 2013	0.1602	0.5366	1.17 (0.41-3.36)
Manos al,[44] 2017	1.2384	0.7110	3.45 (0.86-13.90)
Total			1.71 (1.55-1.89)
Heterogeneity: $\tau^2 = 0.00$; $\chi^2 = 2.11$; $P = .55$; $I^2 = 0\%$			
Test for overall effect: $z = 10.87$; $P < .001$			



Subgroup analysis of Psoriatic arthritis

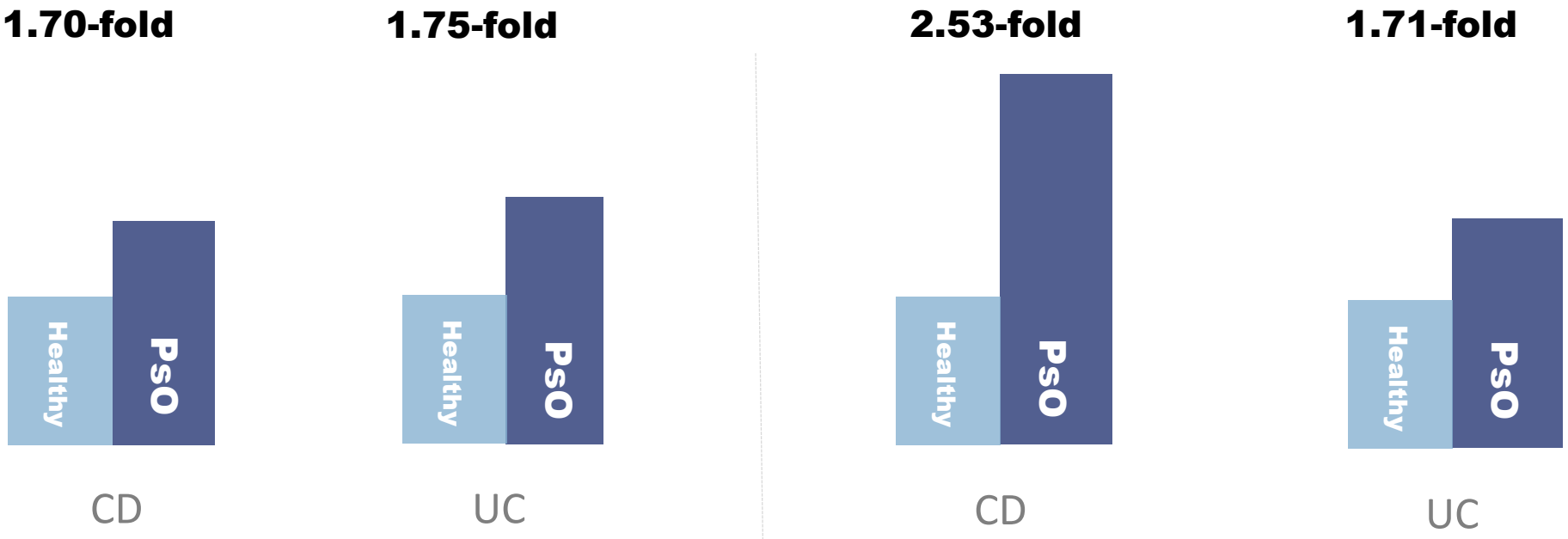
E Subgroup analysis of psoriatic arthritis

Study or Subgroup	Log (RR)	SE	RR (95% CI)
Crohn disease			
Charlton et al,[45] 2018	1.0851	0.3605	2.96 (1.46-6.00)
Manos et al,[44] 2017	0.4055	1.0015	1.50 (0.21-10.68)
Subtotal			**2.74 (1.41-5.32)**
Heterogeneity: $\tau^2 = 0.00$; $\chi^2 = 0.41$; $P = .52$; $I^2 = 0\%$			
Test for overall effect: $z = 2.97$; $P = .003$			
Ulcerative colitis			
Charlton et al,[45] 2018	0.2622	0.3458	1.30 (0.66-2.56)
Manos et al,[44] 2017	1.2384	0.7110	3.45 (0.86-13.90)
Subtotal			**1.74 (0.72-4.17)**
Heterogeneity: $\tau^2 = 0.16$; $\chi^2 = 1.52$; $P = .22$; $I^2 = 34\%$			
Test for overall effect: $z = 1.24$; $P = .22$			

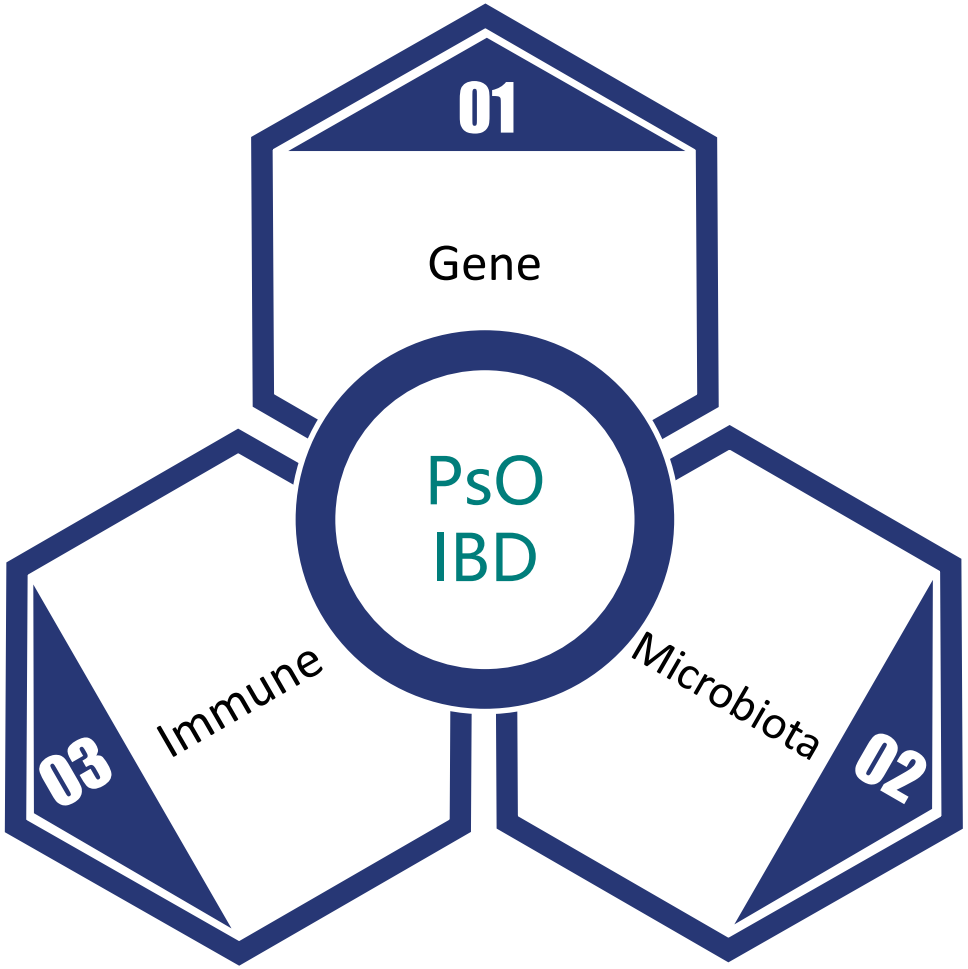


Discussion

- The first meta-analysis to examine the associations of psoriasis with IBD.
- Psoriatic patients were prone to have prevalent and incident IBD.



Discussion



The possible explanations for the identified association of psoriasis with IBD include genetic abnormalities, immune dysfunction, systemic inflammation, and dysregulation of gut microbiota .

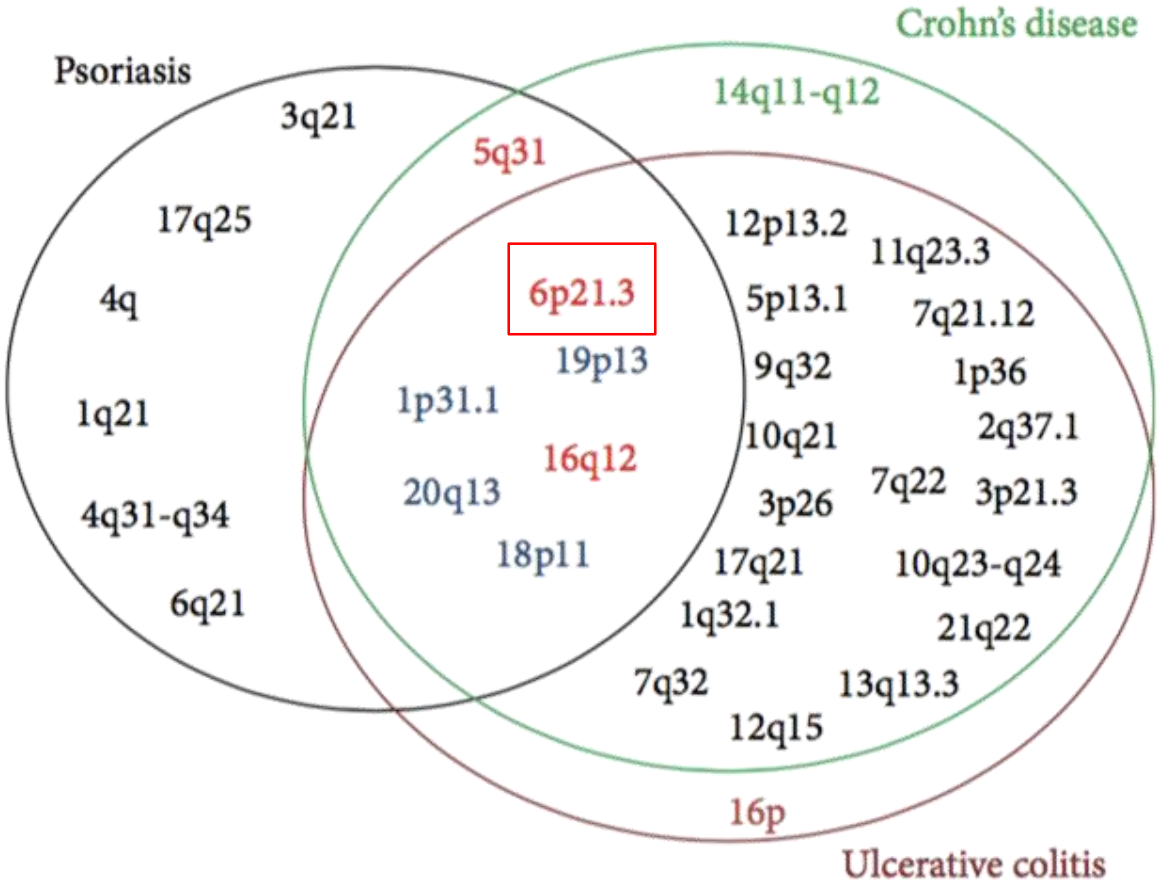
Discussion

MHC-related genes

Chromosome 6p21

Psoriasis: PSORS1

IBD: IBD3



Major compatibility complex (MHC)

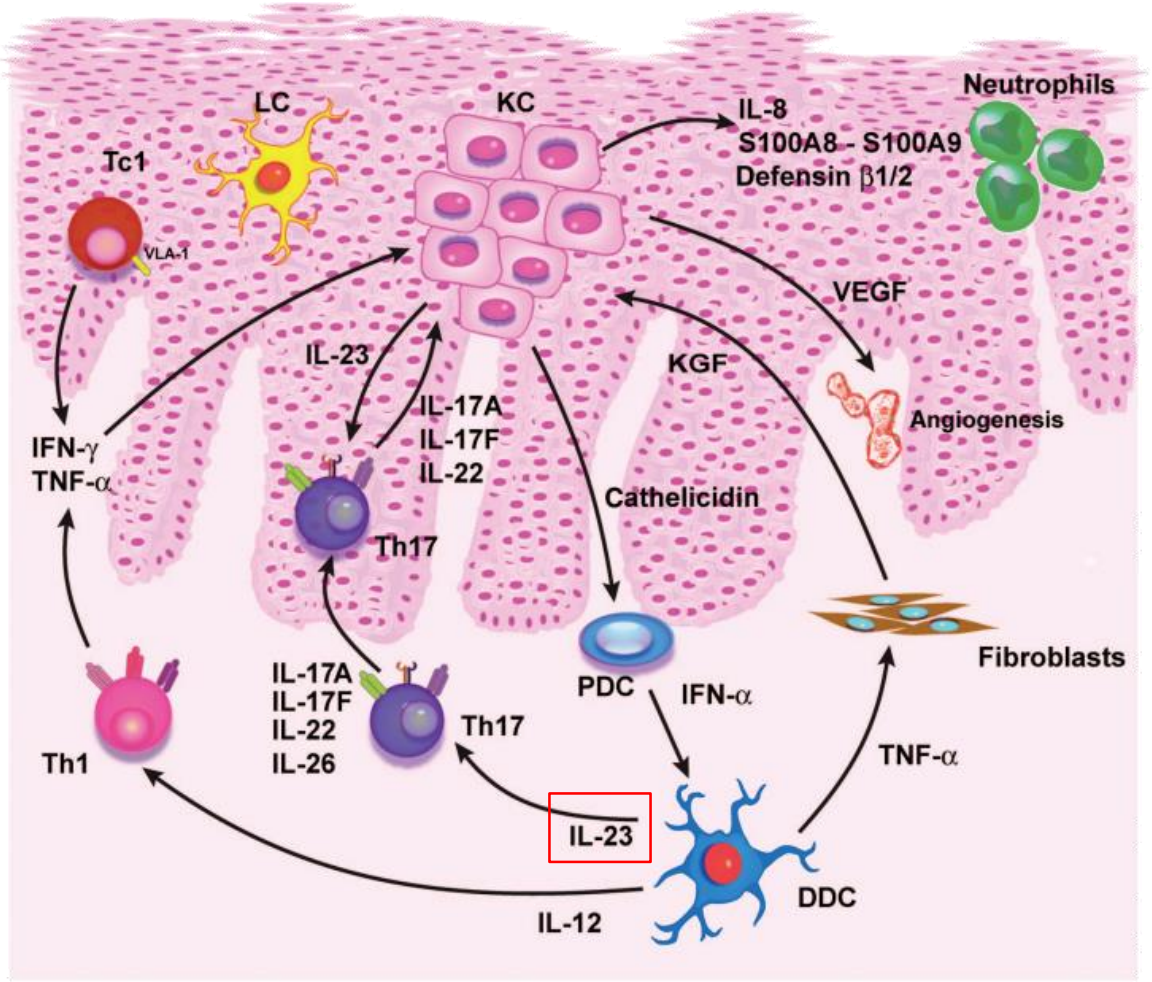
Correlations between psoriasis and inflammatory bowel diseases. Biomed Res Int 2013;2013:983902.

Discussion

Non-MHC-related genes

IL-23R

IL-12B



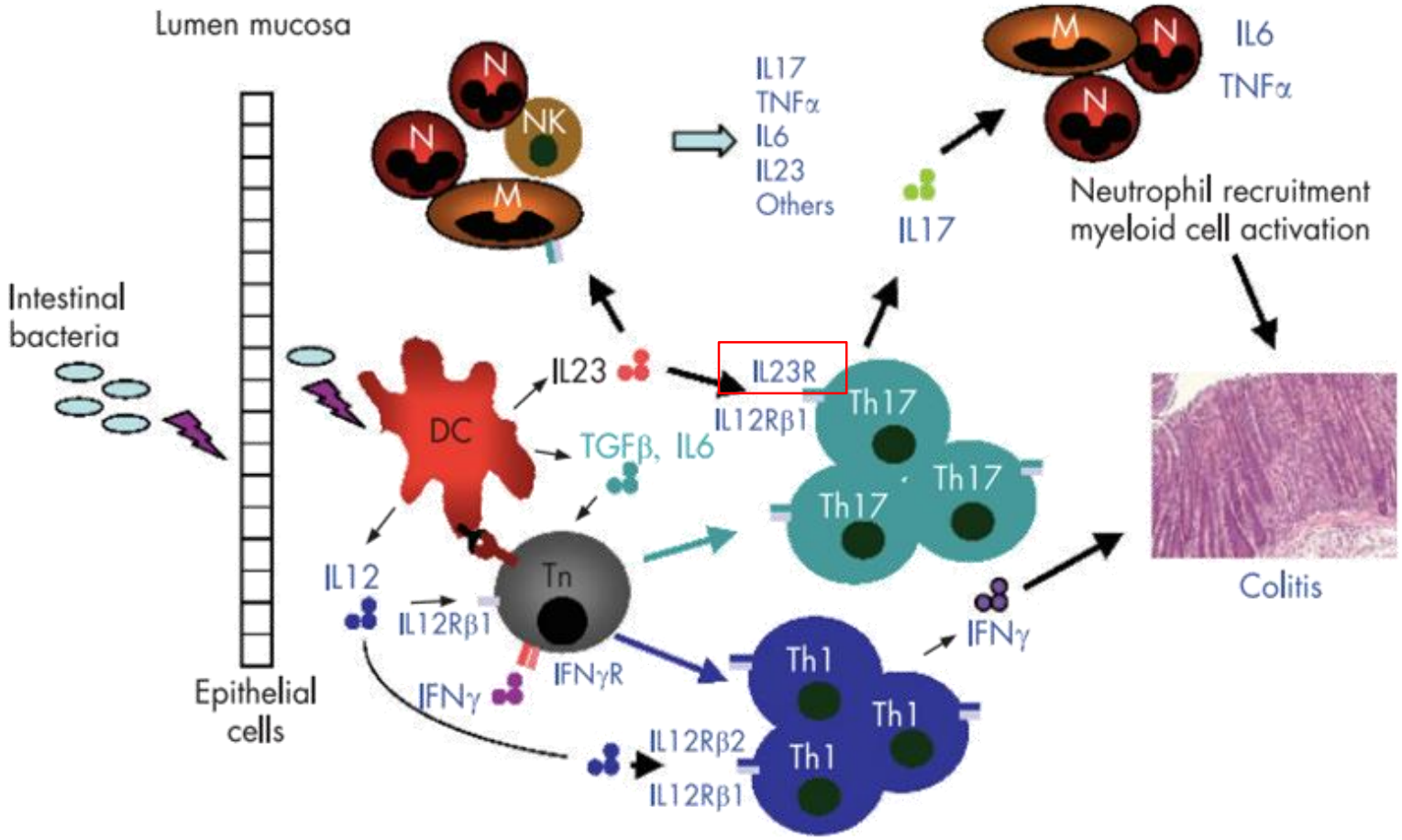
The IL-23/Th17 axis in the immunopathogenesis of psoriasis. J Invest Dermatol 2009;129:1339-50.

Discussion

Non-MHC-related genes

IL-23R

IL-12B



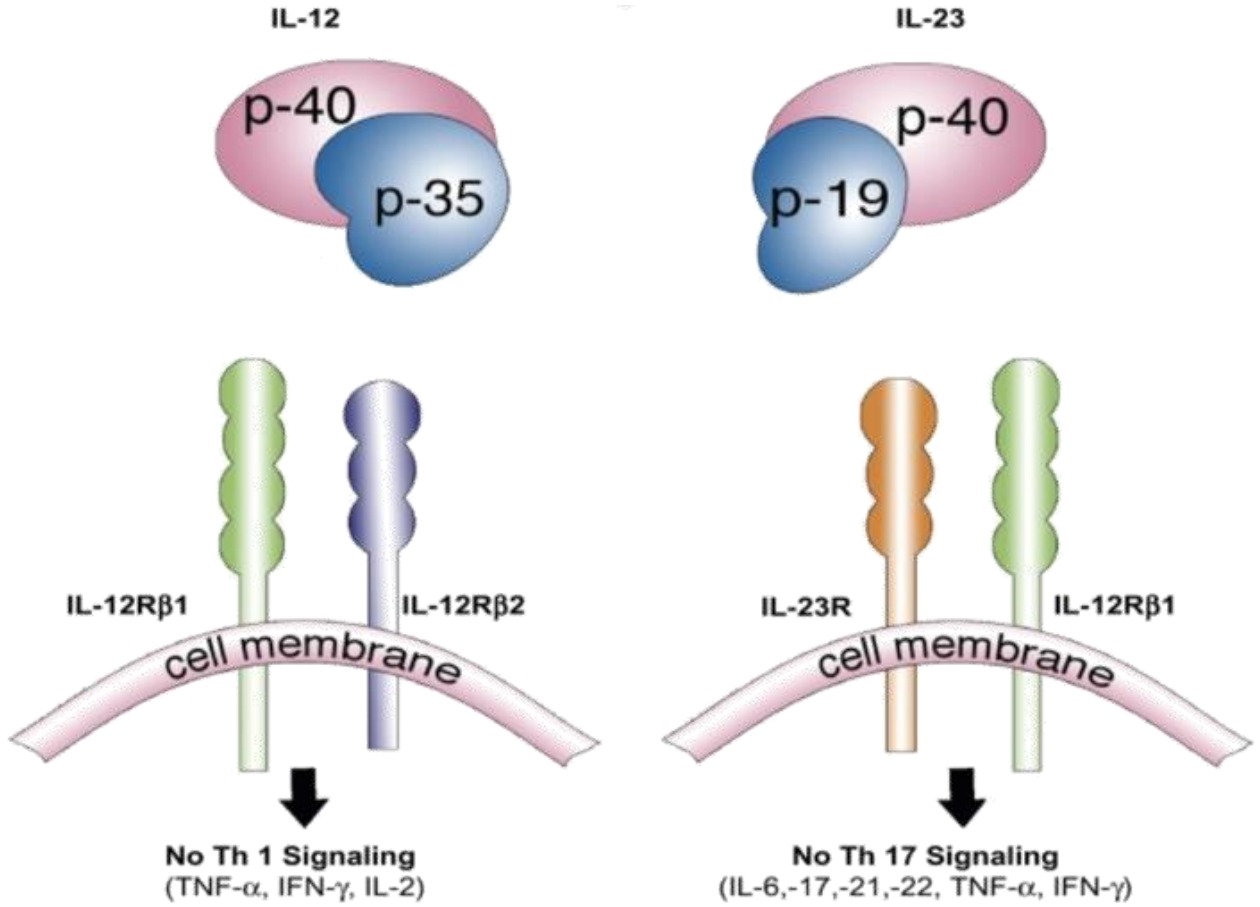
McGovern D, Powrie F. The IL23 axis plays a key role in the pathogenesis of IBD. Gut. 2007;56(10):1333-6.

Discussion

Non-MHC-related genes

IL-23R

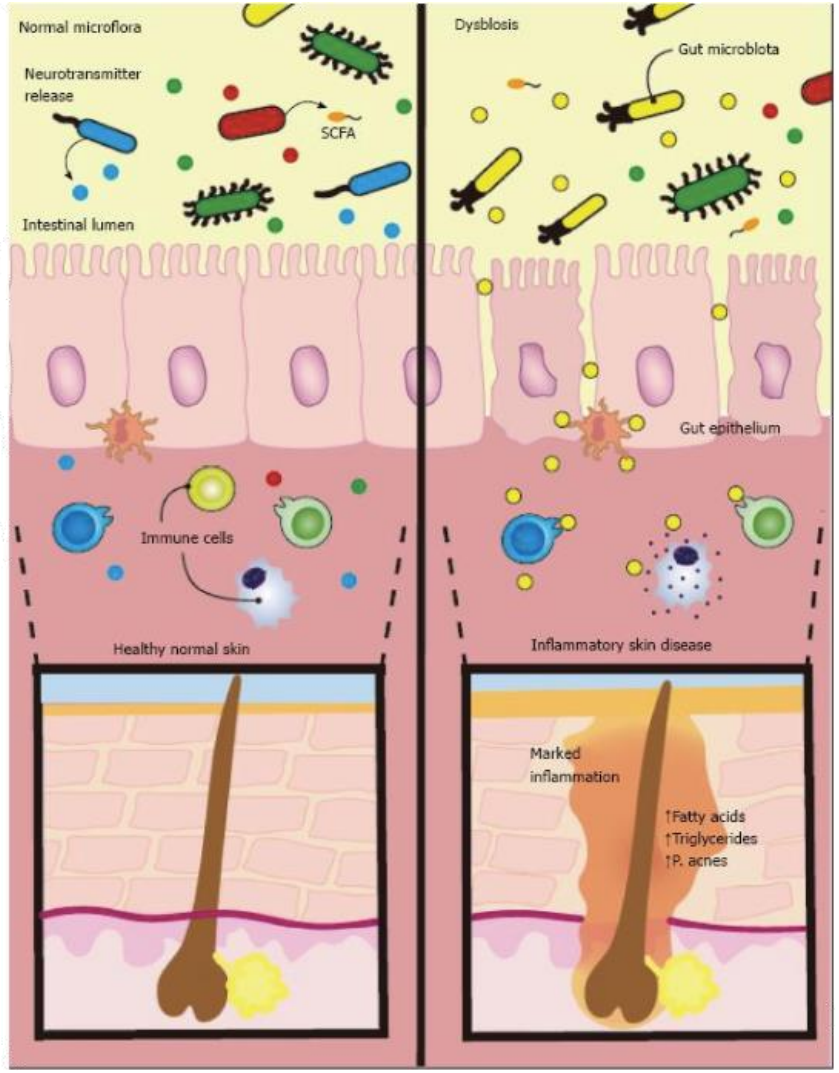
IL-12B



Review of ustekinumab, an interleukin-12 and interleukin-23 inhibitor used for the treatment of plaque psoriasis. Ther Clin Risk Manag. 2010;6:123-41.

Discussion

- The skin and gut show similarities including immerse microbial diversity and bountiful blood supply.
- Microbiota may lead to expression of antimicrobial particles, elevated cytokine levels and consequently, regulation of activity and differentiation of T-cells.
- Psoriatic patients have been found to present with decreased diversity and abundance of gut microbiota that was similar to IBD patients.



Skin-gut axis: The relationship between intestinal bacteria and skin health. World J Dermatol. Nov 2, 2017; 6(4): 52-58

Limitations

- Only one cohort study (Egeberg 2016) reported the association between different severity of psoriasis and IBD.
- Only one case-control study (Tsai 2011) provided data on the association of psoriasis with IBD in Asians.

Conclusion

- The evidence supports an association of psoriasis with IBD.
- Patients with psoriasis should be informed about the increased risk of IBD.
- Gastroenterology consultation is indicated for psoriatic patients presenting with bowel symptoms.

JAMA Dermatology | Original Investigation

Association of Psoriasis With Inflammatory Bowel Disease
A Systematic Review and Meta-analysis

Yun Fu, MD; Cheng-Han Lee, MD; Ching-Chi Chi, MD, MMS, DPhil

IMPORTANCE Patients with psoriasis may experience comorbidities involving cardiovascular diseases, chronic kidney disease, uveitis, psychiatric disturbances, and metabolic syndrome. However, the association between psoriasis and inflammatory bowel disease (IBD) has been largely unclear.

OBJECTIVE To investigate the association of psoriasis with IBD.

DATA SOURCES For this systematic review and meta-analysis, MEDLINE, Embase, and the Cochrane Central Register of Controlled Trials were searched for relevant studies from inception to January 17, 2018.

STUDY SELECTION Case-control, cross-sectional, or cohort studies that examined either the odds or risk of IBD in patients with psoriasis were included. No geographic or language limitations were used in the search.

DATA EXTRACTION AND SYNTHESIS The PRISMA and MOOSE guidelines were followed for data extraction. The Newcastle-Ottawa Scale was used to evaluate the risk of bias of included studies. Crohn disease and ulcerative colitis were analyzed separately and random-effects model meta-analysis was conducted. A subgroup analysis was performed on psoriatic arthritis.

MAIN OUTCOMES AND MEASURES The risk and odds of IBD, Crohn disease, and ulcerative colitis in patients with psoriasis.

RESULTS A total of 5 case-control or cross-sectional studies and 4 cohort studies with 7 794 087 study participants were included. Significant associations were found between psoriasis and Crohn disease (odds ratio, 1.70; 95% CI, 1.20-2.40) and between psoriasis and ulcerative colitis (odds ratio, 1.75; 95% CI, 1.49-2.05). Patients with psoriasis had an increased risk of Crohn disease (risk ratio, 2.53; 95% CI, 1.65-3.89) and ulcerative colitis (risk ratio, 1.71; 95% CI, 1.55-1.89).

CONCLUSIONS AND RELEVANCE These findings suggest that psoriasis is significantly associated with IBD. Gastroenterology consultation may be indicated when patients with psoriasis present with bowel symptoms.

JAMA Dermatol. 2018;154(12):1417-23.