Association Between Autoimmune Diseases and Chronic Rhinosinusitis Phenotypes: A Nationwide Cohort Study

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BACKGROUND

- Chronic rhinosinusitis (CRS): inflammation of the paranasal sinuses and nasal cavity lasting > 12 weeks
- Two major clinical phenotypes: CRSwNP (with nasal polyps) and CRSsNP (without nasal polyps)
- Phenotypes differ in inflammatory mechanisms and treatment response
- Autoimmune diseases: overactive immune response against the body's own tissues → systemic inflammation
- Hypothesis: systemic autoimmunity → sinonasal inflammation → CRS
- Evidence gap: unclear whether CRS risk differs by autoimmune subtype or CRS phenotype

OBJECTIVE

- Investigate the association between autoimmune diseases and CRS at the population level
- Does autoimmune disease increase CRS risk?
- Does the risk differ by autoimmune disease subtype?

WORKING HYPOTHESIS

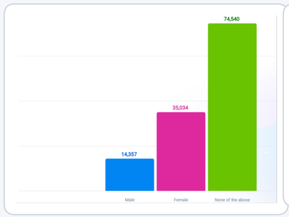


METHODS

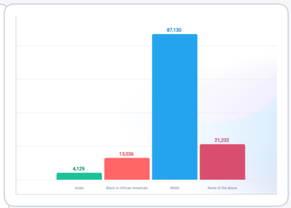
- Retrospective cohort study using Epic Cosmos, a nationwide electronic health record database
- Study population: > 200 million patients; 96,938 with autoimmune disease
- Nine autoimmune conditions evaluated:
  - Inflammatory bowel disease · Rheumatoid arthritis · Sarcoidosis · Psoriasis · Ankylosing spondylitis · SLE · Sjögren syndrome · Scleroderma · Other
- Outcomes: CRSsNP and CRSwNP identified by ICD-9 / ICD-10 codes
- Chronicity ensured: ≥ 2 sinusitis diagnoses ≥ 12 weeks apart
- Analysis: prevalence and risk ratios (RR) with 95% CIs versus the non-autoimmune population

STUDY POPULATION

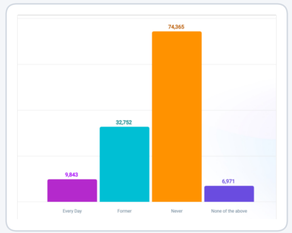
Mean age 65 years · 76% female



Sex distribution



Ethnicity



Smoking history

De-identified federated data · IRB approval not required

RESULTS

- Overall: 5.2% prevalence · RR 0.959 (95% CI 0.904–1.017) — no significant increase in CRS risk (Figure A)

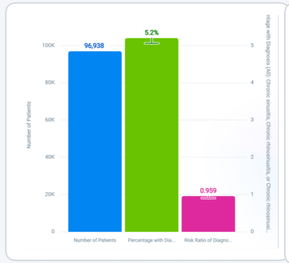


Figure A — Overall: 96,938 patients · 5.2% CRS prevalence · RR 0.959

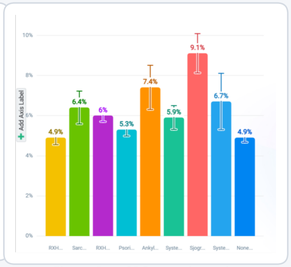


Figure B — CRS prevalence by autoimmune condition

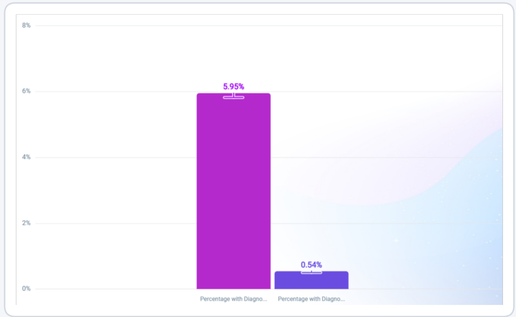


Figure C — Phenotype split: CRSsNP 5.95% · CRSwNP 0.54%

- Risk is disease-specific, not uniform:
- Sjögren syndrome: 9.1% prevalence · RR 1.77 — significantly increased
- Ankylosing spondylitis: 7.4% prevalence · RR 1.44 — significantly increased
- All other conditions: no significant increase; psoriasis and IBD showed modestly decreased risk

DISCUSSION

- Large population-level analysis across nine autoimmune conditions
- Autoimmune disease overall: NOT associated with increased CRS risk
- Significant association limited to Sjögren syndrome and ankylosing spondylitis
- Possible mechanisms:
  - Sjögren: mucosal dryness · impaired sinonasal clearance · altered local immune defense
  - Ankylosing spondylitis: shared inflammatory / immune-mediated pathways
- Limitations: retrospective database · ICD-based diagnoses (misclassification) · no clinical variables (cytokines, imaging, cultures) · residual confounders · no severity or sinus surgery data · association ≠ causation

CONCLUSION

- Autoimmune disease overall NOT associated with increased CRS risk
- Association appears disease-specific: Sjögren syndrome & ankylosing spondylitis
- Further studies needed on inflammatory mechanisms & clinical significance

Selected references available on request.

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