INCIDENCE, PREVALENCE AND CO-OCCURRENCE OF AUTOIMMUNE DISORDERS, TRENDS OVER TIME AND BY AGE, SEX AND SOCIOECONOMIC STATUS. A POPULATION-BASED STUDY IN 22 MILLION INDIVIDUALS.

Background: A rise in the incidence of selected autoimmune disorders has been described, raising the question as to whether the overall incidence of autoimmune disorders might be on the rise due to environmental factors. However, reliable estimates of disease incidence and trends over time, particularly as pertains to autoimmune diseases as a group, are not available. Commonalities and differences between individual diseases also remain poorly understood.

Objectives: To investigate the incidence and prevalence for 19 of the most common autoimmune disorders, to assess trends over time, by sex, age, socioeconomic status, season and region, and to examine rates of co-occurrence among autoimmune diseases.

Methods: We used linked primary and secondary electronic health records of 22 million individuals from the Clinical Practice Research Datalink (CPRD), a cohort that is representative of the UK population in terms of age and sex. We calculated incidence and prevalence of 19 autoimmune disorders from 2000 to 2019 and used negative binomial regression models to investigate temporal trends and variation by age, sex, socioeconomic status, season of onset and region. To characterise co-occurrence of autoimmune diseases, we calculated incidence rate ratios, comparing incidence rates of comorbid autoimmune disease among patients with a first autoimmune disease with incidence rates in the general population, using negative binomial regression models, adjusted for age and sex.

Results: Among the 22,009,375 individuals included in the study, we identified a total of 978,872 patients with a new diagnosis of at least one autoimmune disease between 2000 and 2019 (mean (SD) age: 54.0 (21.4) years, 64% women). Over the study period, age-standardised incidence rates of autoimmune diseases increased by 4%, similarly for men and women. The largest increases were seen in Graves’ disease, coeliac disease and Sjogren’s syndrome, for which incidences have doubled over the past two decades. Two conditions exhibited a significant decrease in incidence (Hashimoto’s thyroiditis and pernicious anaemia). Taken together the 19 autoimmune disorders examined affected 10.2% of the population over the study period (13.1% of women, 7.4% of men). A socioeconomic gradient was evident across several diseases, including Graves’ disease, pernicious anaemia, rheumatoid arthritis, and systemic lupus erythematosus. Seasonal variations were observed for type 1 diabetes (more commonly diagnosed in winter) and vitiligo (more commonly diagnosed in summer), and regional variations were observed for a range of conditions. Autoimmune disorders were commonly associated with each other, particularly Sjogren’s, systemic lupus erythematosus and systemic sclerosis. Patients with type 1 diabetes also had significantly higher rates of Addison’s, coeliac, and thyroid diseases, and multiple sclerosis stood out as having low rates of co-occurrence with other autoimmune diseases.

Conclusion: Autoimmune diseases affect about one in ten individuals. Their burden continues to increase over time, albeit at varying rates across individual diseases. The socioeconomic, seasonal, and regional disparities observed among several autoimmune disorders, implicate environmental factors in disease pathogenesis. The interrelations between autoimmune diseases are commensurate with shared pathogenetic mechanisms or predisposing factors, particularly among connective tissue diseases and among endocrine diseases.

Keywords: Real-world evidence, Gender/diversity issues, Epidemiology


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Background: The multifaceted clinical presentation in crystal-induced arthropathies (CiA) poses challenges to imaging.

Objectives: To formulate evidence-based recommendations on the use of imaging in the diagnosis and management of CiA.

Methods: Following EULAR standard operating procedures a task force of 25 stakeholders from 11 countries was created. Four systematic literature searches were performed in MEDLINE, EMBASE and CENTRAL to guide task force decisions, answering 14 research questions on the role of imaging in gout, calcium pyrophosphate and basic calcium phosphate deposition disease. Level of agreement (LoA) with each overarching principle and recommendation was assessed by numerical rating scale (0–10).

Results: Five overarching principles and 10 recommendations were produced on the role of imaging in making a diagnosis, monitoring, predicting, guiding intervention, and patient education in CiA (Table 1). Overall, the LoA for the recommendations was very high (8.5–9.9).

Conclusion: These are the first recommendations that encompass all common forms of CiA and guide the use of established imaging modalities in this disease group.

Table 1. EULAR recommendations for the use of imaging in CiA in clinical practice

<table>
<thead>
<tr>
<th>Overarching principles</th>
<th>Level of agreement Mean (standard deviation)</th>
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<tbody>
<tr>
<td>A. CiA are typically characterized by intermittent, acute episodes of inflammation, but may also exhibit a persistent disease course with or without superimposed flares.</td>
<td>9.8 (0.5)</td>
</tr>
<tr>
<td>B. Imaging in CiA provides useful information on crystal deposition, inflamma-tion and structural damage.</td>
<td>9.6 (0.5)</td>
</tr>
<tr>
<td>C. The presence of imaging abnormalities, in particular those related to crystal deposition, may not always be related to clinical manifestations.</td>
<td>9.8 (0.5)</td>
</tr>
<tr>
<td>D. Patient information (medical history, physical/laboratory examination, synovial fluid/tissue analysis) should be taken into account when imaging is considered in CiA.</td>
<td>9.6 (0.5)</td>
</tr>
<tr>
<td>E. Imaging in CiA should be performed and interpreted by trained health care professionals.</td>
<td>9.7 (0.7)</td>
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</tbody>
</table>

Recommendations

1. When performing imaging in CiA, both symptomatic areas and disease-specific target sites (i.e. MTP1 in gout, wrist and knee in CPPD, shoulder in BCPD) should be considered.

2. In the diagnostic assessment of gout, US and DECT are both recommended imaging modalities.

3. When characteristic features of MSU crystal deposition on US (i.e. double contour sign or tophi) or on DECT are identified, synovial fluid analysis is not needed to confirm a diagnosis of gout.

4. In the diagnostic assessment of CPPD, CR and US (or CT if axial involvement is suspected) are recommended imaging modalities.

5. In the diagnostic assessment of BCPD, imaging is necessary; CR or US is the recommended modality.

6. In gout, US and DECT can be used to monitor crystal deposition and in case of US, also inflammation. Both modalities provide additional information on top of clinical and biochemical assessment. In case US/DECT are not available, CR can be used to assess structural damage due to gout. The decision on when to repeat imaging depends on the clinical circumstances.

7. In CPPD and BCPD serial imaging is not recommended, unless there is an 9.4 (1.2) unexpected change in clinical characteristics.

8. In gout, assessing the amount of MSU crystal deposition by US or DECT may be used to predict future flares.

9. If synovial fluid analysis is required in the assessment of CiA, US-guidance 9.7 (0.5) should be used in cases where aspiration based on anatomical landmarks is challenging.

10. Showing and explaining imaging findings of CiA to people with such con- 9.4 (0.9) ditions may help them understand their condition and improve treatment adherence in gout.

BCPD: basic calcium phosphate deposition disease; CiA: crystal-induced arthropathies; CPPD: calcium pyrophosphate deposition disease; CR: conventional radiography; CT: computed tomography; DECT: dual-energy computed tomography; MSU: monosodium urate; MTP: metatarsophalangeal joint; US: ultrasound

REFERENCES: NIL

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