

EULAR
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AIR POLLUTION A KEY ENVIRONMENTAL EXPOSURE DRIVING INFLAMMATORY ARTHRITIS DEVELOPMENT

New evidence on pollutants and rheumatic disease shared at the 2022 EULAR Congress

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Mounting evidence has shown that environmental exposures are linked to the development of inflammatory arthritis, with air pollution associated with disruption at a molecular level in the immune system. Pollutants can also have an impact on bone health. Data presented at the 2022 EULAR Congress in Copenhagen show that chronic exposures to air pollutants are associated with incremental increases in the risk of having an autoimmune disease. Meanwhile, a second research group demonstrate that cleaning activities are underestimated sources of silica exposure in women with RA compared to the general population, and may contribute to disease development.

Two abstracts presented by Dr Giovanni Adami at the 2022 EULAR Congress looked at the issue of environmental exposures and their role in disease development.

Particulate matter (PM) is defined as everything in the air that is not a gas. PM includes a variety of chemicals and materials, some of which can be toxic. Data from over 80,000 people in a retrospective observational study in Italy found a positive association between PM levels measured at local air-quality stations and the risk of autoimmune diseases. In fact, every 10 $\mu\text{g}/\text{m}^3$ increase in PM10 concentration was associated with an incremental 7% risk of having autoimmune disease.

Exposure to PM10 above 30 $\mu\text{g}/\text{m}^3$ and PM2.5 above 20 $\mu\text{g}/\text{m}^3$ was associated with 12% and 13% higher risks of autoimmune disease, respectively. When broken down by individual diseases, exposure to PM10 was associated with an increased risk of rheumatoid arthritis (RA) but no other autoimmune diseases, whereas exposure to high levels of PM2.5 was associated with an increased risk of RA and inflammatory bowel disease. Overall, chronic exposure to particulate air pollution above the threshold for human protection was associated with a 10% higher risk of developing immune-mediated diseases.

The same group looked at the association between long-term exposure to PM and osteoporosis in almost 60,000 women at high risk of fracture. The results showed that exposure to PM2.5 was negatively associated with low bone mass at the top of the thigh bone and lumbar spine. Chronic exposure above 25 $\mu\text{g}/\text{m}^3$ for PM2.5 and 30 $\mu\text{g}/\text{m}^3$ for PM10 was associated with a 16% and 15% higher risk of having osteoporotic bone mass scores at any site. The researchers concluded that long-term exposure to air pollution was associated with higher risk of osteoporosis.

Previous studies have shown that breathing in crystalline silica is associated with the development of RA – but this research has historically focused on professional exposures and on male workers. Since substantial amounts of this pollutant are present in other environments, Dr Johanna Sigaux and colleagues set out to identify the main sources of exposure to crystalline

silica in a group of RA patients regardless of their professional activity, and to assess the association between silica exposure and disease features.

The results showed that in women with RA, the main sources of crystalline silica exposure were cleaning activities. For example, handling dusty clothes or talcum powder. Women involved in these activities had higher exposure compared to people in the general population. Across the whole series of RA patients, high silica exposure was independently associated with lung abnormalities such as interstitial lung disease and mediastinal lymphadenopathy.

The study findings suggest that cleaning activities are underestimated sources of crystalline silica exposure that are overrepresented in women with RA compared to the general population, and may contribute to the pathogenesis of the disease.

Source

Adami G, et al. Association between exposure to fine particulate matter and osteoporosis: a population-based cohort study. Presented at EULAR 2022; abstract OP0242.

Adami G, et al. Association between long-term exposure to air pollution and immune-mediated diseases: a population-based cohort study. Presented at EULAR 2022; abstract OP0071.

Sigaux J, et al. Cleaning activities, dusty clothes laundry and talcum handling are underestimated major sources of exposure to crystalline silica in women with rheumatoid arthritis. Presented at EULAR 2022; abstract OP0006.

About EULAR

EULAR – the European Alliance of Associations for Rheumatology – is the European umbrella organisation representing scientific societies, health professional associations and organisations for people with rheumatic and musculoskeletal diseases (RMDs). EULAR aims to reduce the burden of RMDs on individuals and society and to improve the treatment, prevention and rehabilitation of RMDs. To this end, EULAR fosters excellence in education and research in the field of rheumatology. It promotes the translation of research advances into daily care and fights for the recognition of the needs of people with RMDs by the EU institutions through advocacy action.

About the EULAR European Congress of Rheumatology

Since its introduction in 2000, the annual EULAR European Congress of Rheumatology has become the primary platform for exchange of scientific and clinical information in Europe. It is also a renowned forum for interaction between medical doctors, scientists, people with arthritis/rheumatism, health professionals and representatives of the pharmaceutical industry worldwide. The EULAR congress is usually held in June in one of the major cities in Europe.

The scientific programme covers a wide range of topics on clinical innovations, clinical, translational and basic science. Meetings set up by associations of people with arthritis/rheumatism, health professionals and the health care industry complement the programme. The poster sessions, offering lively interaction between presenters and participants, are regarded by many as the heart of the congress.

Over the years, the EULAR Congress has gained a reputation of being a most innovative platform for the practicing physician particularly with respect to the acquisition of information on

novel clinical research. The congress attracts more than 18,000 delegates from more than 130 countries.

The aim of the EULAR European Congress of Rheumatology is to provide a forum of the highest standard for scientific, both clinical and basic, educational, and social exchange between professionals involved in rheumatology, liaising with patient organisations, in order to achieve progress in the clinical care of people with rheumatic diseases.

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