Editorial

The birth of Environmental Rheumatology

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It has long been established that environmental factors play a pivotal role in the pathogenesis, natural history, prognosis and response to therapy of most rheumatic diseases. Atmospheric conditions, air pollution, smoking habits, dietary regimens, exposure to different pathogens, microbiome, emotions, stress and/or psychological factors, and last but not least, socio-economic status and quality of healthcare are all recognised as players in these diseases (1-6). Exogenous and endogenous environmental factors continuously modify the genetic background through epigenetic mechanisms, and modulate the hormonal and immunological systems (7, 8).

However, in spite of the enormous interest on the influence of the environment on human health, in most instances the available literature has only rarely defined the exact role of the single factors and their complexity pattern on the development and evolution of the rheumatic diseases for a number of reasons. First of all, most of the rheumatic diseases are complex multi-factorial conditions of unknown aetiology and often characterised by spontaneous remissions and exacerbations. If the latter behaviour certainly points toward the contribution of environmental factors, most of the current literature that aims to study the pathogenesis of these conditions tends to neglect these factors and suffers from serious methodological biases.

First, in modern medicine there has been an accurate collection of the history of previous illnesses, but no comparable attention has been addressed to a standard record of the environmental data. A second important confounding factor is comorbidity and the number of concomitant drugs assumed over the years, that can represent a problem particularly relevant in elderly people. A third difficulty is related to the growing mobility of the population. Fewer and fewer people spend their entire lives in the same region, with consequent consistent changes in the daily habits and variable environmental exposure. A fourth crucial aspect is related to socio-economic factors and the enormous differences in the access to adequate therapies, due to both healthcare systems and/or to different local conditions within the same nation. These inequalities are certainly relevant for rheumatic diseases, which in most cases are chronic conditions that require continuous adequate monitoring and is crucial for the timing recognition and proper treatment for the rarer diseases. A final confounding factor is that in some parts of the world the management of the rheumatic diseases relies not only on the drugs currently available in the most advanced nations but are often associated to traditional local medications of unproven but potentially relevant effects.

Taken together, it is clear that in the next future it will be important not only to know what a patient has, but also the country, the specific area where he/she lives and the exact place of residence (also with google map coordinates). The spatial dimension is often a key feature to understand the structure of a phenomenon (9). This is a new great challenge for rheumatologists, and yet it is still in its infancy.

In the last few years, the collection of multicentre, multinational collaborative studies on single rheumatic diseases has attempted to face these uncertainties (10, 11). However, to properly address the role of environmental factors, we have to develop a number of novel feasible methodological instruments, such as validated questionnaires for the standardised collection of the appropriate environmental data and of the status of wellbeing of people inhabiting that environment. Second, the scientific community has to foster the identification and standardisation of the

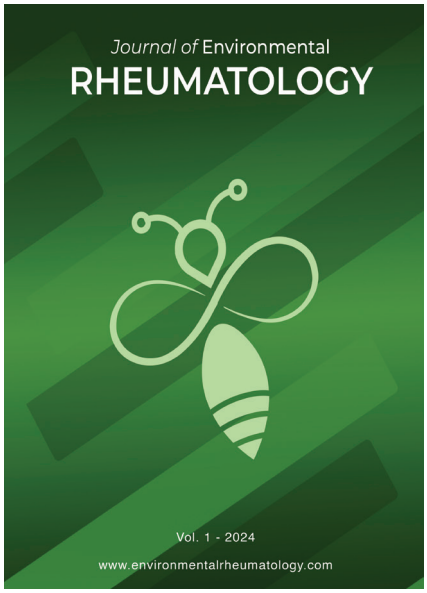

Fig. 1. Cover of the new *Journal of Environmental Rheumatology*.

diagnostic tests to use in the recognition and monitoring of the diseases. Third, to apply an advanced methodological statistical approach: the use of novel algorithms used in machine learning and artificial intelligence are all potential tools for promoting this new field of research (12). As regards the spatial component of environmental data there is a vast array of advanced statistical methods which can integrate data coming from different fields such as physics, biology, economics and geography and many more in the attempt to highlight the semantic dimension of space (13).

So far, the most important international journals were clearly inadequate to cover the different local expressions of the rheumatic disease in all over the world or in peculiar areas of the single countries. For obvious space limitations, they have privileged the acceptance of well-conducted clinical studies from the most scientifically advanced countries, disregarding the publication of smaller series, yet well conducted descriptions of clinical cases coming from different parts of the world. These contributions, however, coming from the most remote geographical areas, although often under-powered or of lesser scientific quality, may provide crucial necessary background data to identify the specific role of these environmental factors.

To win this new challenge, however, the good will of the single investigators is not sufficient, and it is crucial to sensitise the scientific societies, the patients' representatives, and the political authorities to promote and finance the appropriate studies. In the meantime, as an old independent voice in international rheumatology, we have decided to play our part to foster the knowledge of this intriguing aspect with two different initiatives:

1. Starting from this issue CER will introduce a specific session called "*Environmental Rheumatology*". In this section we plan to regularly update our readers on the progress in this field with dedicated reviews and to host the best original studies submitted on this topic.
2. We have also decided to launch a new peer-reviewed open-access online journal called "*Journal of Environmental Rheumatology*" (Fig. 1), which will publish both articles initially submitted to CER, and specific contributions submitted directly to this new journal. To encourage the submission of the best contributions from all over the world, the articles will be published in the *Journal of Environmental Rheumatology* with no publication fees for the first 2 years.

Repeating what we stated in 1983:

"…..The birth of a new Journal is invariably fraught with difficulties of all kinds. If we fail, it will not be due to a lack of enthusiasm or good will. If we succeed, the credit will go to those who have given their help and support for the initiative" (14).

Website:
www.environmentalrheumatology.com

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