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Two itchy-skin diseases that can go much deeper

Psoriasis and eczema can have complex causes and consequences that researchers are seeking to uncover.

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In his mid-teens during the 1970s, Maarten de Wit had severe joint pain in multiple parts of his body. He had to wait another three years until the age of 19 before being diagnosed with arthritis.

‘At the time, arthritis was seen as something for the elderly and not a teenager,’ said de Wit, a Dutch native who is now 62 years old.

Detection difficulty

De Wit’s form of arthritis is hard to diagnose and can seriously limit daily activity. Called psoriatic arthritis, or PsA, it frequently stems from a non-communicable skin disease named psoriasis, which causes skin cells to grow faster than usual and results in itchy and scaly patches mainly on the elbows, knees and scalp.

Over the past two decades, advances have been made in treating PsA even as detection remains difficult. De Wit said his own condition has improved since the advent in the 2000s of a group of medicines that include immune modulators, monoclonal antibodies and blood products (and that are collectively called biologics).

‘I could literally feel the pain going away from my hands, my knees, my feet,’ he said.

De Wit represents a patient organisation for rheumatic – or inflammatory – conditions including PsA and chairs a study group for collaborative research at the Switzerland-based European Alliance of Associations for Rheumatology, also called EULAR.

EULAR is part of a research project that received EU funding to improve detection of PsA and perhaps even prevent its onset. Earlier diagnosis would reduce the risk of PsA-induced health effects such as joint inflammation.

After the late diagnosis of his PsA, de Wit in the 1990s had a full knee replacement and was forced by persistent joint pain throughout his body to quit his job as a company trainer.

Called HIPPOCRATES, the project in which EULAR is involved runs for five years until mid-2026 and is also funded by the European pharmaceutical industry through a partnership named the Innovative Medicines Initiative, or IMI. HIPPOCRATES is co-led by two professors at University College Dublin in Ireland: Stephen Pennington, a proteomics researcher, and Oliver FitzGerald, a consultant rheumatologist.

'Lots of people end up with a late diagnosis when there may already be significant areas of damage that can't be reversed,' said FitzGerald.

Treatment challenge

Psoriasis affects around 2% of people worldwide, including 6.4 million in Europe. Among them are de Wit's three children, now in their 30s, all of whom have had psoriasis since their teens.

Up to 30% of people with psoriasis develop PsA. But it's hard to know which psoriasis patients will get PsA and what the effect of specific treatments will be.

'We don't have any tests or indicators that predict which medication will work in which people,' de Wit said.

HIPPOCRATES brings together 27 participants from across Europe with a range of expertise – a multidisciplinary approach that Pennington said is crucial.

'Dermatologists are experts in analysing the skin component of the disease, but not in terms of being able to make an assessment about people who may be progressing to psoriatic arthritis,' he said.

The project is using existing molecular, genomic and other clinical data from patients. It's also enrolling a further 25 000 adults with psoriasis from across Europe in an online study.

By applying machine-learning and artificial-intelligence techniques to the combined data, the researchers aim to find new markers able to signal the onset of PsA and the likely response to medication.

They hope to accelerate development of diagnostic algorithms for assessing the likelihood of psoriasis developing into PsA.

The involvement of patient groups like EULAR since the project's beginning has been central to the research, according to FitzGerald.

'It's a crucial part of what we do that we hear the patient voice,' he said.

Eyes on eczema

PsA is just one example of the complications that can result from inflammatory skin diseases and the gaps in knowledge about what causes them.

Psoriasis is thought to stem from an immune-system problem and to be influenced by both genetic and environmental factors.

Another EU-funded project – BIOMAP – is seeking to improve understanding not only of psoriasis but also of eczema, which causes dry, itchy and cracked skin.

Formally known as atopic dermatitis, or AD, eczema is associated with asthma and a nasal condition called rhinitis. While the links among these conditions aren't fully understood, they all cause inflammation.

AD affects an estimated 220 million people worldwide.

'Psoriasis and AD are not only common skin diseases, they're common diseases overall,' said Professor Stephan Weidinger, a dermatologist at Kiel University in Germany.

He leads BIOMAP, which is due to wrap up in March 2024 after five years, works with HIPPOCRATES and also receives industry funding via the IMI.

With more than 30 academic and industry partners from around Europe, BIOMAP has been building a central data portal that the team calls unprecedented in scale.

Disease subtypes

The researchers are using advanced molecular techniques to analyse information from more than 50 000 patients.

The aim is to identify distinct subtypes of the diseases – potentially even identifying new ones – with characteristic signatures and biomarkers.

That, in turn, could lead to treatments that are more effective and cheaper.

The data collection is largely complete and in-depth analysis is taking place, with two subtypes of AD already identified through blood samples. Subtypes of health conditions are also called endotypes.

'I think we'll be able to provide further evidence that there are endotypes that can be clearly distinguished,' said Weidinger.

He said society as a whole has a stake in the research effort, especially because afflictions such as AD are often lifelong ones starting in childhood.

'Skin diseases are often underappreciated – maybe because they're usually not life-threatening,' Weidinger said. 'But the burden is huge and the costs to society are enormous.'

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