Using machine learning to predict the likelihood of achieving relief from psoriatic arthritis

Full abstract title: Machine learning identifies an association between pre-existing radiographic damage and long-term clinical outcomes in patients with psoriatic arthritis (PsA)


Date: December 2020

Please see the final abstract for full information about authors, acknowledgments and recommendations. This summary may not account for all authors or statements. This summary is not intended to provide medical advice.

Why was this study done?

To examine machine learning as a tool to identify associations between radiographic damage and clinical outcomes. PsA is a type of autoimmune disease involving a variety of cells that release different substances to help the body fight the infection. In some diseases, the immune cells can attack the body's normal tissues and cause damage. PsA is a form of arthritis that affects some people with psoriasis. In PsA, inflammation results in swollen and painful joints and tendons, and can happen in any area of the body.1 The study was designed to use machine learning to predict the likelihood of minimal disease activity (almost complete resolution of joint symptoms, and swelling of the fingers and toes).2

What did this study find?

PsA patients who had joint damage before their diagnosis were less likely to achieve minimal disease activity.3 Joint damage before treatment with secukinumab strongly predicted the likelihood of a patient achieving minimal disease activity.4 This analysis showed that joint swelling and tenderness was strongly related to joint damage.

What did this study look at?

This study looked at data from two previous studies to identify which patients had joint damage before treatment with secukinumab. Patients treated with secukinumab had reductions in the number of swollen and tender joints from as low as 3 out of 10 patients to as high as 4 out to 10 patients as of the start of the study, and this remained consistent for the 52 weeks of the study.5

Why does this matter?

Given the debilitating symptoms patients with PsA experience, it is important that treatments are developed that control symptoms and prevent disease progression.2 This study helps to identify patients who are at risk of developing severe radiographic damage and allows for early treatment in order to prevent further joint damage.

References

5. More on the FUTURE 1 study can be found here: https://clinicaltrials.gov/ct2/show/NCT01392326

Additional information

Further information

Glossary

Biologic medicine: a treatment made using living organisms, rather than being chemically synthesized.

Information: Methodology is a serious approach to science, which involves a variety of tasks that release different information into the body. Significant information is transmitted from the body to the brain. This is usually done through physiological mechanisms or artificial intelligence.

Machine learning: methodology is a serious process that uses ready-made knowledge through certain algorithms to gain new knowledge (i.e. artificial intelligence).

Minimum activity: a state in which the body's primary functions, with the exception of the demands on long-term tissues.

Psoriatic arthritis (PsA): a form of arthritis that affects joints and skin. It is characterized by inflammation of the joints and skin, and can affect any area of the body. The disease is associated with psoriasis.

Who sponsored this study?

Novartis Pharma AG, Basel, Switzerland

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Why was this study done?

To examine the safety of secukinumab in patients with psoriasis. Secukinumab is a type of medication called a biologic. It helps reduce inflammation by blocking one of the proteins that activates inflammatory cells.3 This study looked at the safety of secukinumab in 16 weeks of patients with psoriasis, who were experiencing symptom relief and reducing further joint damage. Given the debilitating symptoms patients with PsA experience, it is important that treatments are developed that control symptoms and prevent disease progression.2 This study helps to identify patients who are at risk of developing severe radiographic damage and allows for early treatment in order to prevent further joint damage.

What did this study find?

The safety of secukinumab was consistent with previous studies in psoriasis and PsA. Patients treated with secukinumab had reductions in the number of swollen and tender joints from as low as 3 out of 10 patients to as high as 4 out to 10 patients as of the start of the study, and this remained consistent for the 52 weeks of the study.5 This study examined adverse events reported in patients with psoriasis who were treated with secukinumab for 16 weeks.

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