# COVID vaccine induced psoriasis in dupilumab treated eczema

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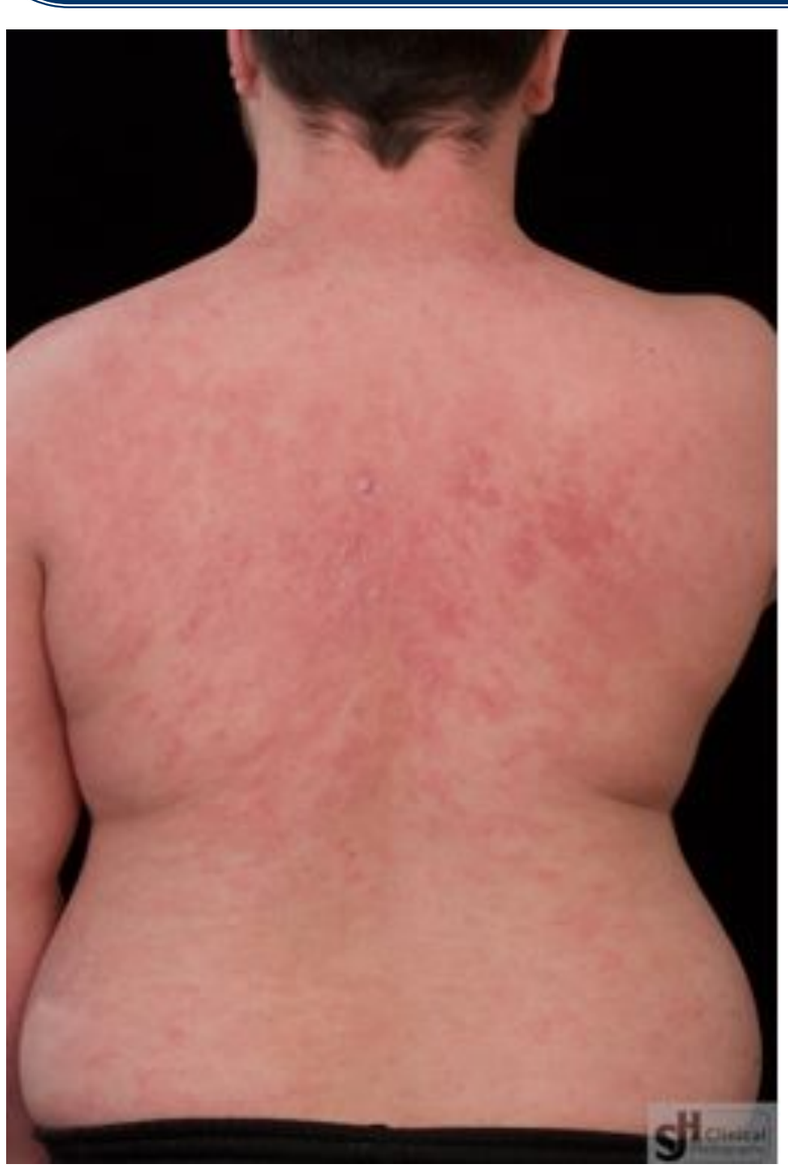
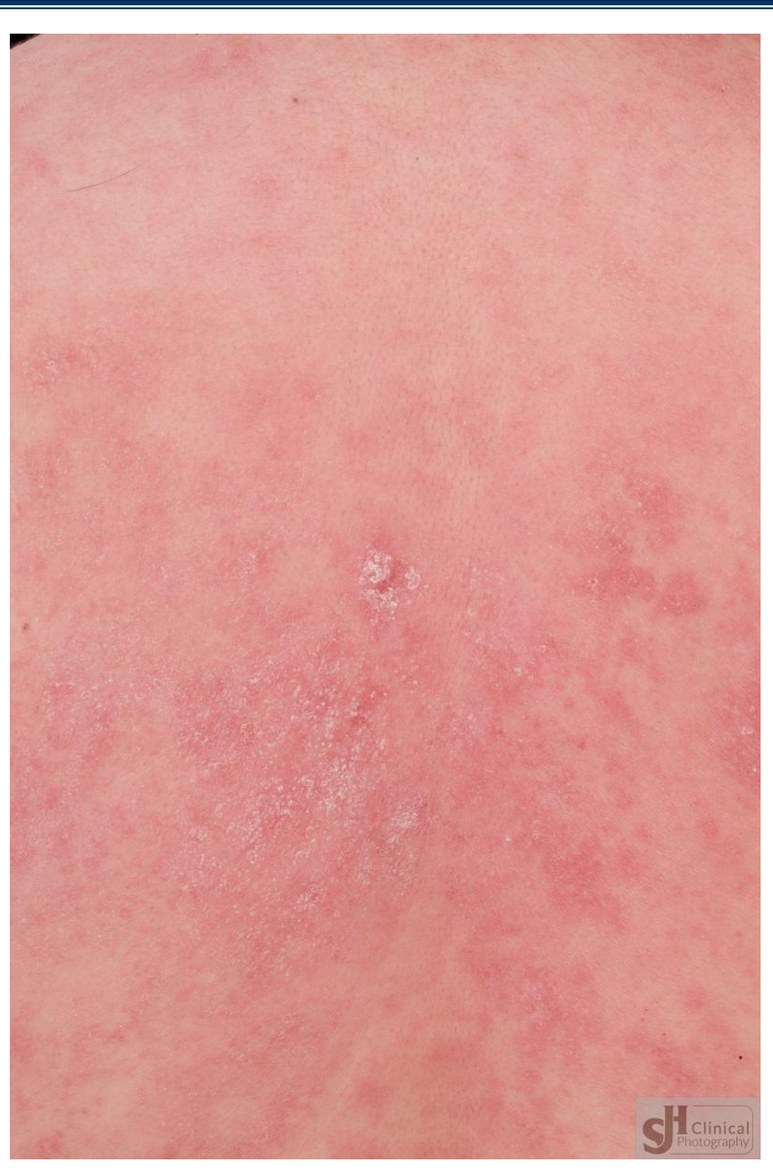
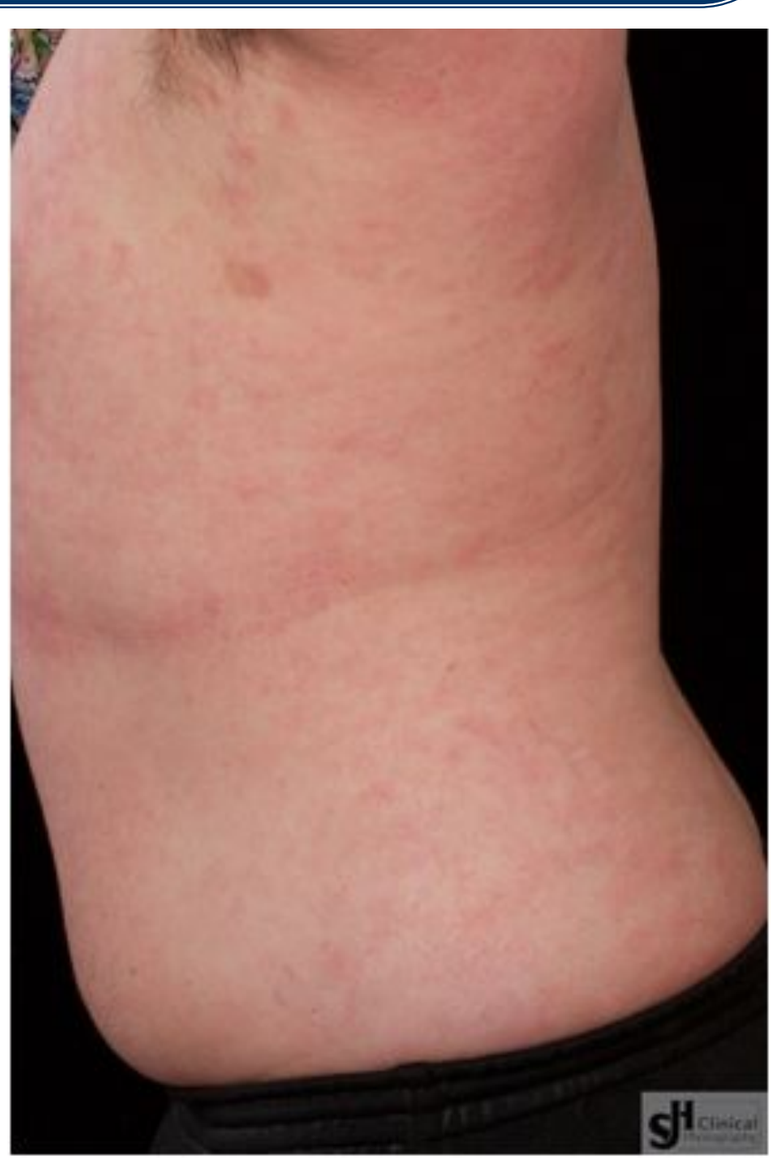
## Background

Psoriasis and atopic dermatitis are T cell mediated auto-inflammatory diseases. Rarely both conditions co-exist due to polarisation of the T cell immune response. Th1 activation and its subsequent cytokines and effector Th cells (Th17 and Th22) mediate the pathogenesis of psoriasis whereas in atopic dermatitis the cytokine pathway is Th2 driven[1]. Dupilumab is a monoclonal antibody which modulates the Th2 cytokines, IL-4 and IL-13 which mediate inflammation[2]. This drug has been life changing for eczema patients for whom treatment options previously have been limited with varying degrees of success. Dupilumab was the first biologic drug approved for the treatment of atopic dermatitis and currently is the only licensed biologic treatment for AD in Ireland.




## Case

An 18-year-old man with a history of chronic atopic dermatitis from childhood which was recalcitrant to topical and systemic therapy was commenced on dupilumab. He achieved excellent control of his skin for two and a half years. He appeared to develop a secondary failure of dupilumab which coincided with his second dose of the Moderna mRNA vaccine. He reported feeling generally unwell after the first dose. After his second dose his skin flared. This rash was morphologically different to his prior eczematous rash and notably was not itchy. On examination he had a diffuse erythematous rash of thin coalescent plaques with adherent scale which was clinically consistent with psoriasis.

## Discussion

There have been rare reports of psoriasis arising in the setting of dupilumab treatment for atopic dermatitis. There were no reported psoriasis cases in dupilumab clinical trials. However, a recent retrospective cohort for the French GREAT Research Group identified 16 cases reported to date and their study further identified 7 cases indicating that this may be an important adverse effect to be aware of in dupilumab treatment[3]. In this study psoriasiform lesions appeared an average of 16 weeks (range 1–72 weeks) after dupilumab was commenced whereas our case was significantly longer with psoriatic rash appearing 2.5 years after treatment initiation. This leads us to hypothesise there was an additional factor which played a role in this immune shift and the clinical timeline indicates the Moderna COVID-19 vaccine was the key supplemental element. It is postulated that the modulation of the Th2 cascade may lead to increased activity of the Th1 pathway normally seen in psoriasis. We hypothesise that an increased IL6 production and Th17 recruitment associated with mRNA vaccine[4] in the setting of dupilumab treatment has resulted in this unusual presentation.

## References

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