

## Editorial

# Calprotectin: a key and versatile protein

When we are facing a patient with psoriatic arthropathy (PsA), naturally, we would like to know how severe the arthropathy is. Currently, we could measure the inflammatory markers such as ESR and CRP. However, the acute phase reactants are often normal. It is generally thought that these are raised in less than 50% of people with psoriatic arthritis. A marker that could aid making the diagnosis, assessing disease severity, and predicting a prognosis of PsA would be most welcomed by dermatologists.

In this regard, calprotectin might be a promising marker. Calprotectin is a calcium and zinc binding protein and is a member of the family of S100 leukocyte proteins secreted primarily by neutrophils and monocytes.<sup>1</sup> It is a heterodimer comprising two different proteins S100A8 and S100A9 and has antimicrobial activities. Release of calprotectin occurs when there is activation of the neutrophils, resulting in it being detected in serum or other body fluids and it could therefore be utilised as an inflammatory marker.

As a matter of fact, calprotectin has already found its application in the field of gastroenterology. In patients with inflammatory bowel disease (IBD), high levels of faecal calprotectin could be found. Hence, it is a useful test for screening inflammatory bowel disease and can be used to aid deciding whether colonoscopy is indicated for a patient.<sup>2</sup> In a young patient suffering from gastrointestinal symptoms which are suggestive of either irritable bowel syndrome (IBS) or IBD, a normal calprotectin level favours the diagnosis of IBS

implying that the patient may just need a treatment for IBS but not an endoscopy. Faecal calprotectin might also be useful in distinguishing colorectal cancer from non-malignant GI conditions.<sup>3</sup>

In children, calprotectin has been reported to be useful in GI diseases as well as in other conditions. It has been found to be potentially useful in the screening of cystic fibrosis and monitoring of the response to its treatment.<sup>4</sup> Calprotectin has also found its application in the field of obstetrics and gynaecology, e.g. the plasma calprotectin level was found to be two-fold higher in patients with pre-eclampsia when compared with controls.<sup>5</sup>

Having seen so many applications in other fields, one would wonder if it could be useful in the field of dermatology. Calprotectin has been found to correlate with disease severity of psoriasis. The calprotectin level was significantly higher in the severe psoriasis group when compared with that in the mild group.<sup>6</sup> It was found to be significantly raised in patients with PsA and it was found to be higher in patients with polyarthritis than those with mono- or oligo-arthritis.<sup>7</sup> Serum calprotectin level was also found to correlate with disease activity in acute Kawasaki disease and the level of calprotectin-positive circulating endothelial cells may also correlate with the severity of vasculitis.<sup>8</sup> Furthermore, the epidermis of hidradenitis suppurativa patients has been found to express calprotectin.<sup>9</sup> Apart from its presence in many inflammatory skin conditions, calprotectin is involved in other functions, as detailed in the

review article in this issue. Almansouri et al gives us an account of the various functions and roles of calprotectin in the skin. In this review, we will see how calprotectin exerts its effect on keratinocytes, how it participates in the response of keratinocyte to injuries, its role in inflammatory skin diseases, and its role in innate immunity, etc.

Calprotectin could be useful in the understanding, diagnosis, monitoring and treatment of many skin diseases. However, there are as yet relatively few studies or research investigating the relationship of calprotectin and skin diseases. It might be rewarding to put in more effort to find out what skin conditions in which calprotectin might play a role, to elucidate the pathophysiological processes in these entities, and to formulate appropriate treatment strategies accordingly.

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