There is a well described association between psoriasis and several other diseases, including obesity, arthritis, diabetes, osteoporosis, depression, inflammatory bowel disease and cardiovascular diseases. More recently, psoriasis has also been linked to several endocrine diseases and this article will discuss the most important of these.

The endocrine system

The endocrine system consists of a group of eight glands in different locations throughout the body, including the thyroid, pituitary and adrenal glands and pancreas. They secrete various hormones which act as chemical messengers to control and regulate various processes, including growth and development, metabolism, sexual function and mood.

Disorders of the endocrine system involve production of either too little hormone (called 'hypo' function) or too much ('hyper' function). Thus, an overactive thyroid is called hyperthyroidism (too much hormone) and an underactive thyroid is called hypothyroidism (too little hormone).

The association between psoriasis and diabetes is well known, but psoriasis has also been linked to an increased risk of several less common endocrine disorders, including Addison's disease, thyroid disease and Cushing's syndrome (also referred to as Cushing's disease). This short article discusses the strength of the associations for these three conditions and the implications for individuals with psoriasis.

Some clues

A good place to begin if we want to evaluate the risk of endocrine diseases in patients with psoriasis is to look at the prevalence of these conditions in large epidemiological surveys. The problem is that there are very few such surveys, so evidence is limited.

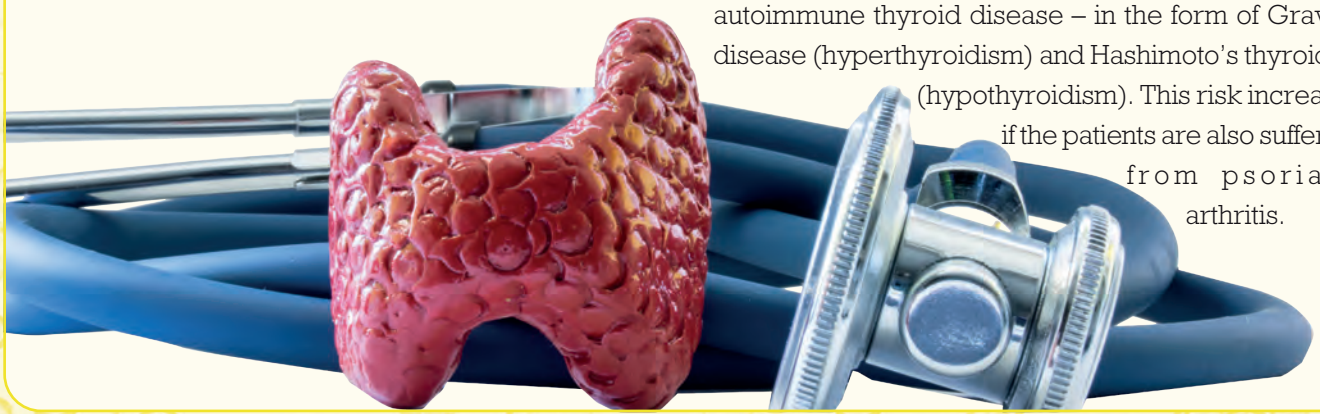
An interesting exception is a study carried out in Israel, which evaluated the prevalence of endocrine disorders in 3,161 patients with psoriatic arthritis (PsA), compared with 31,610 healthy controls.[1] Compared with control patients, significantly more patients with PsA had hypothyroidism (12.7% vs 8.6%) and Cushing's syndrome (0.3% vs 0.1%). Both osteoporosis and diabetes were significantly more common in patients with PsA than in control groups. However, the prevalence of a range of other endocrine diseases, including hyperthyroidism, acromegaly (excess growth hormone) and diabetes insipidus, was similar in both groups.

This study did not show an increased risk for Addison's disease in the psoriasis group, but (as discussed below) other research suggests that there is an increased risk for this disease in patients with psoriasis.

Psoriasis and thyroid disease

The possible link between psoriasis and thyroid disease has been explored in several studies, but the results have been contradictory. In the study quoted earlier, investigators found an association with hypothyroidism, but not for other thyroid diseases.[1] However, a recent study from Taiwan assessed the risk of thyroid diseases in patients with psoriasis and psoriatic arthritis in a large, national cohort.[2] The study included 149,576 patients with psoriasis alone and 13,266 also with psoriatic arthritis, as well as 162,842 matched controls without psoriasis. The mean age in all groups ranged from 43 to 45 years and roughly 40% were female.

Results clearly showed that patients suffering from psoriasis have an increased risk of developing autoimmune thyroid disease – in the form of Graves' disease (hyperthyroidism) and Hashimoto's thyroiditis (hypothyroidism). This risk increases if the patients are also suffering from psoriatic arthritis.



In one sense, the link between psoriasis and thyroid diseases is unsurprising, given that both are autoimmune diseases. Hence the researchers themselves speculate that the association may be explained by cell-mediated inflammation, which is involved in both types of diseases. An additional factor could be that both diseases share the same genetic predisposition. Either way, the connection between psoriasis and an increased risk of thyroid disease is relevant and even more important because most thyroid disorders are eminently treatable.

Addison's disease

Addison's disease, also called primary adrenal insufficiency (PAI), is a rare disease of the adrenal glands in which they cannot produce normal quantities of the adrenal hormones cortisol and aldosterone.

In the study referred to earlier, there was no increased risk observed for Addison's disease in patients with psoriasis compared with healthy controls.[1] However, a recent review from Denmark clearly suggests otherwise.[3] The study population was based on the Danish National Patient Register, from which the researchers included[1],199 individuals with PAI and 5,995 matched controls, 65% of whom were female and with an average age of 52.8 years. The data was then interrogated for cases of psoriasis and psoriatic arthritis (PsA).

In this population-based study, PAI was significantly associated with psoriatic arthritis, but not psoriasis alone, when compared with matched controls. As to the question of which came first – psoriasis or PAI – the investigators showed that it was most likely that psoriasis preceded the PAI.

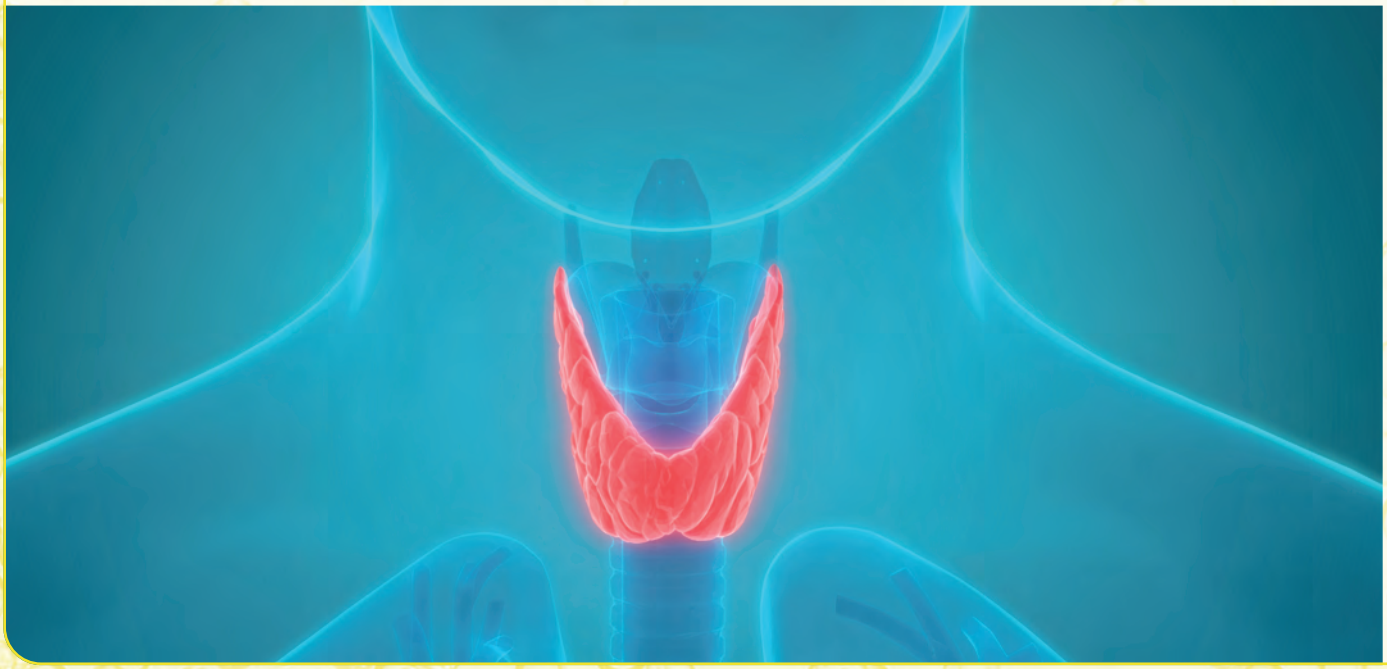
The explanation for the link is not clear, but - as with thyroid disease – is likely to be related to the underlying autoimmune response, characteristic of both diseases.

Although the link between the two diseases is significant, it is important to remember that Addison's disease is exceedingly rare. In the UK, the rate is 39 cases per 1 million (3.9/100k) of population, whereas in Denmark, the figure is 60 cases per 1 million (6.0/100k) of population.

Cushing's syndrome

Cushing's disease is a condition in which the body produces an excess of cortisol from the adrenal glands, which are small triangular structures located on top of each kidney. It is a rare disease – just 13 cases per 1 million – and is caused by a benign tumour, either of the pituitary gland (in the brain) or in the adrenal glands.

In the study referred to earlier, there was a threefold increase in risk of Cushing's disease in patients with psoriatic arthritis compared with healthy controls.[1] However, this was just 0.3% versus 0.1%, so still an extremely low risk. Importantly, this association



has not been found anywhere else in the scientific literature and the authors are not sure whether this association is real; it could be simply due to biases in the study. So overall, this is probably not a significant finding.

There is another form of Cushing's disease worth mentioning: the iatrogenic form. Iatrogenic disease happens when the treatment prescribed by a doctor produces unwanted effects (the word derives from the Greek iatros, which means healer). In the case of psoriasis, Cushing's syndrome can be due to long-term, high-dose steroids, usually prescribed orally. However, there are also cases in which prolonged topical use may also result in the features of Cushing's disease: weight gain, moon face, bruising etc.[4] Nowadays, however, this is likely to be an extremely uncommon complication.

Discussion

Diabetes and osteoporosis can both be regarded as endocrine disorders, each of which is strongly linked to psoriasis. In this article, however, the main concern has been the much less common endocrine diseases which may be linked to psoriasis. Based on the available evidence, we have identified three conditions:

1. Addison's disease is characterised by weight loss, fatigue, low blood sugar, nausea, depression and abdominal pain. While there is an increased risk for this disease in psoriatic arthritis, in absolute terms this is an exceedingly small excess risk. Symptoms such as abdominal pain, depression and fatigue are much more likely to be due to other much more common causes than Addison's disease, which only occurs in roughly 1 in 25,000 people. In this sense it is clinically relevant, but not practically relevant.

2. Cushing's syndrome is an even rarer condition than Addison's disease and there is no clearly demonstrated association with psoriasis. There is an iatrogenic form due to excessive use of steroids but, again, this is rare and so not something seen in practice.

3. There is an increased risk of thyroid disease in psoriasis and this has genuine practical implications. It may present as (a) an overactive thyroid (Graves' disease or hyperthyroidism) – with weight loss, anxiety, tremor of hands and/or fingers and an enlarged thyroid gland, or (b) an underactive thyroid (Hashimoto's thyroiditis or hypothyroidism – with fatigue, constipation, depression and weight gain.

Practice points

Cushing's disease, Addison's disease and various thyroid disorders have all been associated with psoriasis. However, only thyroid diseases are relevant in clinical practice. Family doctors should bear this in mind when managing patients with psoriasis and should arrange for suitable investigations in the event of relevant symptoms becoming apparent.

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Scientific references

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