

# Is the Pathology in Atopic Dermatitis Limited Only to the Skin?



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Atopic dermatitis (AD) is a chronic, inflammatory, and frequently generalized skin disease. The prevalence of AD is 2% to 3% of adults and 15% to 20% of children.<sup>1</sup> AD is a condition that negatively affects quality of life due to often severe pruritis and visibly erythematous areas of the skin.<sup>2</sup> AD can be as detrimental to the patient as psoriasis; however, it can be even worse than psoriasis because AD involves more persistent pruritis that can result in poor sleep quality and frequent cutaneous infections. The etiology of AD is recognized as an internal and external disease as there are both skin barrier dysfunction and immune dysregulation.<sup>3</sup>

In this issue of the journal, Ungar et al<sup>4</sup> used <sup>18</sup>F-fluorodeoxyglucose positron emission tomography (PET)/magnetic resonance imaging (MRI) to assess the levels of inflammation in the carotid arteries and aortas of patients with moderate-to-severe AD. The authors found greater vascular inflammation in patients with moderate-to-severe AD versus healthy controls and also demonstrated that patients with very severe AD showed higher inflammation than both patients with moderate-to-severe AD and healthy controls.

This pioneering study is the first to directly document, with PET/MRI, carotid and aortic vessel inflammation in patients with AD, which implies that AD is not just a cutaneous disease but may represent an internal state of inflammation. Similarly, psoriasis is another inflammatory skin condition that was also recently found to be more of a systemic disease given evidence of an internal state of inflammation. Moreover, anti-TNF biologic therapies used in treatment of psoriasis are associated with a reduction in coronary artery inflammation and, consequently, myocardial infarction through stabilization of coronary artery plaques.<sup>5,6</sup> Adalimumab, an anti-TNF biologic agent, has even been shown to reduce mortality through a decrease in harmful cardiovascular events.<sup>7</sup> Psoriatic disease also has many other significant comorbidities such as obesity, hypertension, and metabolic syndrome, which are likely exacerbated by internal vessel inflammation.<sup>8</sup>

Patients with AD who have chronic and generalized inflammation may be at greater risk for these serious systemic comorbidities as well, similar to the recent findings in psoriasis. However, unlike this

recent discovery in psoriasis where the higher incidence of heart attack and stroke in psoriatic patients leads to the discovery of vessel inflammation, the authors did the opposite. Here, they present evidence for vascular inflammation in AD from only very few preliminary studies suggesting that similar clinical manifestations may occur in AD as in psoriasis. This critical finding opens up a whole new area of investigation in AD and inflammatory skin diseases such as studying whether patients with AD have higher risk of heart attack or stroke compared with healthy controls.

The clinical implications of these findings can immediately be integrated into daily practice. This research suggests that patients with AD should establish and follow regularly with a primary care provider for routine preventative care, even if the patient is young and relatively healthy. This is due to the potential for the dangerous comorbidities discussed above. Moreover, systemic therapy in AD may offer more benefit than just treating the cutaneous pathology and possibly even provide preventative strategies for avoiding the suggested systemic sequelae of AD. This study, and others like it, demonstrate that inflammatory skin disease such as AD is more than just a cutaneous disorder but could represent a systemic inflammatory disease with serious comorbidities as a result of vessel inflammation. Although more studies are needed with larger sample sizes, this study is groundbreaking in its conclusions regarding AD and vascular inflammation. With more research on AD and its therapies, care of patients suffering from this condition will be greatly improved not only for their skin but for their entire body leading to longer and healthier lives for these patients.

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