

# A New Discovery on What's Causing Itchiness

Analysis by [Dr. Joseph Mercola](#)

March 04, 2024

## STORY AT-A-GLANCE

- › Research led by Harvard Medical School scientists discovered that *Staphylococcus aureus* associated with itchy skin diseases activates sensory neurons that drive the perception of itch, which until now was believed to be driven by inflammation in the skin
- › Eczema is not technically an autoimmune disease, but it is strongly associated with the development of multiple autoimmune conditions, and is strongest for disorders that involve the skin, gastrointestinal tract and connective tissue
- › Increasing intake of omega-3 fats has demonstrated the ability to reduce symptoms of inflammation and the prevalence of atopic dermatitis, which is likely a result of an imbalanced omega-6 to omega-3 intake
- › Most people may not have to resort to pharmaceutical interventions to lessen symptoms and improve their quality of life. Utilizing strategies that include probiotics, aloe vera gel and virgin olive oil, coconut oil, colloidal oatmeal cream, stress management and witch hazel may offer significant relief from the condition

A team of researchers led by scientists from Harvard Medical School published the results of an animal study<sup>1</sup> in the journal *Cell*, in which they demonstrated the process that triggers severe itching in people with eczema. According to the National Eczema Association,<sup>2</sup> there are 31.6 million people in the U.S. who have some form of eczema.

The highest prevalence occurs in early childhood, and it's estimated that 1 out of every 10 individuals will have eczema at some time during their lifetime. Eczema, also called atopic dermatitis, is not always simple to diagnose. Roughly 60% of those with atopic

dermatitis receive a definitive diagnosis within 12 months after the symptoms first begin, while it can take two years or more for 16%.

The condition affects people of all races, skin colors and ethnicities. For those who have the condition, itching is the most burdensome symptom, with 60.5% of adults reporting severe or unbearable itching in the two weeks before the survey. Many of those with moderate to severe disease also report having inadequate control. Even when treatment is available, over 50% have concerns about long-term use of the medication and over 50% have found treatment is ineffective.

Eczema<sup>3</sup> is a group of seven types of inflammatory skin conditions, which typically begin during childhood or adolescence. The skin condition can range from mild to severe and many people experience flare-ups, which are times when they have more acute symptoms. These flare-ups can last days or several weeks and can lead to symptoms that require hospitalization for treatment.

## **Research Finds What May Take the Itch Out of Eczema**

The researchers of the featured study began<sup>4</sup> with the understanding that microbes play a role in generating the sensation of itch and that your skin is constantly exposed to microbes and pathogens. The role that microbes might play in the perception of itch has been unknown, but this team believes their data show *Staphylococcus aureus* (*S. aureus*) is associated with itchy skin diseases and that it activates sensory neurons that drive the perception of itch.

Until now, most believed that the perception of it was driven by inflammation in the skin, but this team found the process is separate from the cause of the eczema condition.<sup>5</sup> Instead, the researchers believe *S. aureus*, an infectious virus that commonly lives on your skin, triggers specific enzymes that are responsible for triggering itchiness.

Researchers swabbed the skin of 13 people who had eczema and 14 healthy participants. Using the swabs, mice were exposed to *S. aureus*, causing them to develop an intense itch, which got worse and led to skin damage. The team then modified

different versions of the microbe and through the process of elimination discovered the enzyme – V8 protease – was responsible for driving the perception of itch.

The researchers found that the enzyme has direct interaction with nerve cells in the skin.<sup>6</sup> They also compared the microbiomes from the skin samples in the participants and found that nearly everyone who had atopic dermatitis also had *S. aureus* on their skin and that the balance of the normal skin microbiome in those with eczema was off balance, which allowed the microbe to flourish.

The bacteria trigger a reaction by first releasing an enzyme that attaches to nerves, which then activates a protein on the nerve that transmits the itching signal to the brain. The idea for treatment was to block the receptor that originally induced itch, which would then block the perception of itchiness and reduce the skin damage caused by severe scratching.

The team identified an FDA-approved drug for treating blood clots that blocks a receptor on platelets, which is the same receptor on skin nerve cells. The next step for the research team is to use the active ingredient in the medication, vorapaxar, in a topical cream.

## **Eczema: Significant Comorbidity With Autoimmune Diseases**

According to the National Eczema Association,<sup>7</sup> no one cause for eczema has been identified and there is at least one cause for each of the different types. However, one of the most common causes is an overactive immune system that can contribute to the development of the symptoms, including skin inflammation.

While atopic dermatitis is not technically an autoimmune disease, research has determined that diagnosis of atopic dermatitis places you at higher risk of multiple different autoimmune diseases, including lupus erythematosus, ulcerative colitis, Celiac disease, Crohn's disease, rheumatoid arthritis and vitiligo.<sup>8</sup>

A 2021 case-control study<sup>9</sup> using the Swedish national health care registers evaluated data from the population aged 15 years and older between 1968 and 2016. The

researchers included all those with atopic dermatitis who were an inpatient or had been seen by a specialist as an outpatient. These individuals were matched by sex and age to healthy controls.

The researchers found that the association with multiple autoimmune diseases was greater than the association with just one autoimmune disease and was strongest for autoimmune disorders that involved the skin, GI tract and connective tissue.

While past studies had demonstrated that there was an association between atopic dermatitis and some common autoimmune diseases, this study determined that the association was strongest when participants had multiple immune diseases.

Organic pollutants like aluminum, pesticides and other environmental toxins have been associated with autoimmunity conditions since these chemicals induce oxidative stress and alterations in the immune system.<sup>10</sup>

## **Healing Eczema From the Inside Out**

Research data have identified a link between your diet and atopic dermatitis. Changes in diet are among some of the more popular natural alternatives to treating the condition. In a 2022 poster presentation<sup>11</sup> at the Revolutionizing A Topic Dermatitis Conference, the study authors reviewed the results of seven studies that used docosahexaenoic acid (DHA) and eicosatetraenoic acid (EPA) in the treatment of atopic dermatitis.

These are two omega-3 fatty acids that have known anti-inflammatory effects and have been widely studied for their health benefits. The researchers found that using omega-3 supplementation did not appear to prevent allergic symptoms, but did decrease skin inflammation and the prevalence of atopic dermatitis in the study populations. The poster presentation was later published in the British Journal of Dermatology.<sup>12</sup>

Omega-3 fatty acids have metabolites that include resolvins, which research has demonstrated have a strong anti-inflammatory effect, including during allergic and inflammatory diseases.<sup>13</sup> A 2015 study<sup>14</sup> looked at the administration of omega-3 fatty acids and omega-6 fatty acids in the prevention of atopic dermatitis. They found long-

chain omega-3 fatty acids were a promising approach in the prevention of atopic dermatitis.

The effect that the administration of omega-3 fatty acids has on atopic dermatitis may be a function of the imbalance typically found in the Western diet. As I've written before, **omega-3 fats are required** for a wide variety of bodily functions, including cell division, function of cell receptors, cognition and heart health.

In a 2016 editorial,<sup>15</sup> James J DiNicolantonio, PharmD., discussed the importance of balancing your omega-6 to omega-3 ratio and noted, "It is therefore essential to return to a balanced dietary omega-6 to omega-3 ratio based on data from evolutionary studies." The reason that omega-3 supplementation may help atopic dermatitis is that you have an imbalance of omega-3 and omega 6 fats.

## **Tips and Tricks to Help Your Eczema at Home**

There is no cure for eczema, but there are strategies that can help hydrate the skin and avoid your triggers, which helps keep the condition from worsening and lowers the risk of infection. According to the American Academy of Dermatology (AAD),<sup>16</sup> dermatological treatments can include corticosteroid creams, Pimecrolimus cream, tacrolimus ointment, Crisaborole ointment, or Ruxolitinib cream. Your dermatologist may also suggest systemic biologic medications.

Yet, most people may not have to resort to pharmaceutical interventions to lessen symptoms and improve their quality of life. In addition to using omega-3 fatty acids to treat your eczema from the inside out, several options have far fewer side effects and many you can do at home that can significantly reduce your symptoms.

**Weather changes** — Some people experience exacerbations of their eczema when the weather turns colder. The National Eczema Society<sup>17</sup> suggests keeping your home at a regular temperature and wearing thin layers of clothing that you can layer or remove. Consider using a humidifier during the cold weather months to raise the humidity in your home.

Pay special attention to areas of your body that are sensitive to the cold, such as your hands and face, when you go outside. Choose soft, seam-free fabrics to curtail irritation from rough, scratchy hats, scarves and gloves.

---

**Probiotics** – A review of six randomized controlled trials<sup>18</sup> including 241 people with atopic dermatitis found the use of probiotics significantly improved the SCORing Atopic Dermatitis (SCORAD) measure in adults, but it did not show a significant improvement in skin itch or severity.

---

**Aloe vera and virgin olive oil** – Aloe vera gel has antibacterial properties and is commonly used to help hydrate skin and promote wound healing. One 2020 study<sup>19</sup> evaluated the use of a combination product of aloe vera gel and virgin olive oil and compared the results against the control group using a common systemic corticosteroid, betamethasone, for six weeks.

The data showed the combination product was superior to betamethasone in the treatment of eczema in measures of disease severity, quality of life and eosinophil count.

---

**Colloidal oatmeal cream** – A 2020 study<sup>20</sup> evaluated the effectiveness of colloidal oatmeal cream on hand eczema and found "that colloidal oatmeal, a natural product with proven barrier protection, moisturization, anti-inflammatory and soothing properties, can have ameliorative effects on eczema severity symptoms in patients with chronic irritant HE [hand eczema]."

---

**Coconut oil** – A 2019 study<sup>21</sup> "demonstrated the anti-inflammatory activity of VCO (virgin coconut oil) by suppressing inflammatory markers and protecting the skin by enhancing skin barrier function. This is the first report on anti-inflammatory and skin protective benefits of VCO in vitro."

---

**Stress management** – There is an association between psychological stress and exacerbations of atopic dermatitis.<sup>22</sup> Seek out stress management strategies that

work for you, such as yoga, meditation, journaling, light exercise, or [Emotional Freedom Techniques \(EFT\)](#).

---

**Witch hazel** – [Witch hazel](#) has a broad range of medicinal applications, including being an anti-inflammatory, astringent, moisturizer and having antimicrobial properties. These may contribute to the known effect of relieving itching associated with eczema and helping with oozing eczema.<sup>23</sup>

---

**Rose geranium essential oil** – One study called it "a source of new and safe anti-inflammatory drugs,"<sup>24</sup> as it has potent anti-inflammatory activity that was comparable in effect to diclofenac using histological analysis of inflammatory inhibition.

---

**Lavender oil** – In a review of the properties and effects of lavender oil, one paper<sup>25</sup> reported lavender oil had anti-inflammatory and antinociceptive properties that have made it effective in treating dermatitis and eczema, which in animal studies had effects comparable to the corticosteroid dexamethasone.

---

## Sources and References

---

- <sup>1, 4</sup> Cell, 2023; doi: 10.1016/j.cell.2023.10.019
- <sup>2</sup> National Eczema Association, Eczema Statistics
- <sup>3</sup> National Eczema Association, What Is Eczema?
- <sup>5</sup> Daily Mail, December 18, 2023
- <sup>6</sup> The Sunday Times, December 16, 2023
- <sup>7</sup> National Eczema Association, What Is Eczema, What Are the Causes of Eczema?
- <sup>8</sup> Allergy, Asthma & Clinical Immunology, 2021; 17(96)
- <sup>9</sup> The British Journal of Dermatology, 2021; 185(2)
- <sup>10</sup> Integrative Medicine: A Clinician's Journal, 2021; 20(2)
- <sup>11</sup> Dermatology Times, December 11, 2022
- <sup>12</sup> British Journal of Dermatology, 2023; 188(2)
- <sup>13</sup> Frontiers in Immunology, 2020; 11
- <sup>14</sup> JDDG: Journal der Deutschen Dermatologischen Gesellschaft, 2015; doi: 10.1111/ddg.12780
- <sup>15</sup> BMJ OpenHeart, 2016;3(e000385)
- <sup>16</sup> American Academy of Dermatology, October 10, 2023
- <sup>17</sup> National Eczema Society, About Cold Weather and Eczema
- <sup>18</sup> Journal of Health, Population and Nutrition, 2022;41(37)
- <sup>19</sup> Journal of Pharmacopuncture, 2020;23(3)

- <sup>20</sup> Clinical, Cosmetic and Investigational Dermatology, 2020;13
- <sup>21</sup> Journal of Traditional and Complementary Medicine, 2019;9(1)
- <sup>22</sup> ActaDV, 2010;90
- <sup>23</sup> Mount Sinai, Eczema
- <sup>24</sup> Libyan Journal of Medicine, 2013;8
- <sup>25</sup> International Journal of Clinical Pediatric Dentistry, 2022;15(3)