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Atopic Dermatitis is a Multi-Organ Disorder Disease Involving Not Only the Skin but also the Intestinal Tract

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1. Introduction

Based on test data, we have experienced cases in which atopic dermatitis patients have a high multi-antigen positive rate, which is not seen in patients with allergic diseases such as bronchial asthma and allergic rhinitis. In addition, we often encounter patients with atopic dermatitis who have exorbitant IgE levels. In addition, it is widely recognized that *Staphylococcus aureus* is detected at a high rate from the skin of patients with atopic dermatitis. *Staphylococcus aureus* produces many toxins, which are named superantigens [1,2]. Dr. Yamada [3] of Kinki University has already reported that many patients with atopic dermatitis have colitis when examining the large intestine of atopic dermatitis. Professor Kira [4] of Kyushu University has already reported that many patients with atopic dermatitis have myelitis. Therefore, we also examined the duodenum and cervical spine of many patients with atopic dermatitis, and experienced many disorders of the intestinal tract and cervical spine in addition to the skin in patients with atopic dermatitis. In addition, we have experienced many cases in which these two organs were damaged in the same case of atopic dermatitis.

Our experience to date leading to the argument that atopic dermatitis is not only a skin disease but also a multisystem disease:

We thought that sterilization of *Staphylococcus aureus* detected on the skin of patients with atopic dermatitis with disinfectants would increase the therapeutic effect. Therefore, in June 1993, as the first case, in addition to general treatment, we applied a diluted antiseptic povidone-iodine solution to the eruption against *Staphylococcus aureus* detected on the skin. As a result, we experienced improvement in the patient's skin eruptions and symptoms in a short period of time. Therefore, when we tried a combination of disinfection with povidone-iodine solution in combination with general treatment for atopic dermatitis patients in many cases, we obtained many effects. In 1993, we made a presentation at the Japanese Society of Allergology in Kumamoto. This announcement became widely known, and in September of the following year, NHK's TV program: Today's Health was broadcast as My Announcement: Disinfection Therapy for Atopic Dermatitis. After the broadcast, many patients with atopic dermatitis visited our Chiba City Hospital from all over Japan, and we gained a lot of clinical experience. At the Third Asian Pacific Congress on Antisepsis, Sydney, January 1997, our presentation entitled New successful treatment with disinfectant for atopic dermatitis was published in Dermatology 1997; 195(suppl 2) [5]. From these reports [6], Isodine therapy became widely known in Japan.

Also, the November 1998 TBS TV show: Friday TV Stars, Big Hit! titled these are the famous Japanese doctors2, who gave me the opportunity to introduce them to the Isodine therapy. Taking this opportunity, we were able to see many patients with atopic dermatitis and accumulate a lot of clinical experience. And our presentation titled Significance of *Staphylococcus aureus* toxin (superantigen) in atopic

dermatitis in 2004 was published in Science of Skin [7] in 2004. In 2003, the previous year, Dr. Ito et al [8] wrote a paper titled "Is atopic dermatitis a risk factor for intervertebral disc degeneration? " in Journal of the Neurological Sciences. Dr Kino et al. [9], had reported that there is a lesion in the colon of infants of atopic dermatitis with a food allergy. Among them, they have reported to the Pediatric Radiology that it has also improved inflammation of the colon along with the improvement of the rash of patients in 2002.

In 2015, Dr. Kobayashi [10] of Keio University published a paper reporting that *Staphylococcus aureus* is involved in the onset and exacerbation of atopic dermatitis. However, in 2016, we thought that the symptoms of atopic dermatitis may be caused not only by damage to the skin but also by other organs. We wrote a paper on the importance of disinfection as a general treatment against *Staphylococcus aureus* [11-13]. Inspired by Dr. Kobayashi's paper, we wrote a paper in the same year that atopic dermatitis might be a superantigen disease. This article was highly evaluated, and I was able to make a presentation titled "Atopic dermatitis is one of superantigens diseases" in the lifelong learning course of the online bulletin of Chiba University School of Medicine. After that, our article [14], including the fact that the frequency of community-acquired infections of MRSA [15] increased, was published in the course that was renewed (**https://inohana.jp/hq/?p=4517**). Based on the data we have reviewed so far, both duodenal injury and cervical spine injury were observed in 21 of 32 (65.6%) patients with atopic dermatitis (Table 1).

Table 1: Duodenal biopsy and Cervical MRI findings.

Case No.	Age	Histological diagnosis	MRI diagnosis	Clinical diagnosis
1	43	Chronic Duodenitis	CS,OYL	CM
2	32	Chronic Duodenitis	CS	CM
3	31	Chronic Duodenitis	CS	CM
4	26	Chronic Duodenitis	WNR	CM
5	21	Chronic Duodenitis	WNR	CM
6	23	Chronic Duodenitis		WNR
7	25	Chronic Duodenitis	CS	CM
8	28	Mild Duodenitis	CS	CM
9	28	Chronic Duodenitis	WNR	CM
10	36	Chronic Duodenitis	CS	CM
11	33	Duodenitis	WNR	CM
12	24	Mild Duodenitis	CS	CM
13	29	Chronic Duodenitis	CS	CM
14	28	Duodenitis	CS	CM
15	26	Duodenitis	WNR	WNR
16	24	Mild Duodenitis	CM	CM
17	28	Mild Duodenitis	CM	CM
18	20	Chronic Duodenitis		WNR
19	26	Chronic Duodenitis	CS	CM
20	21	Chronic Duodenitis	CS	CM
21	32	WNR	CS	CM
22	28	WNR	CS	CM
23	24	Chronic Duodenitis	CS	CM
24	26	Chronic duodenitis	CS	CM
25	28	WNR	CS	CM
26	30	Chronic duodenitis	CS	CM
27	34	WNR	CS	CM
28	21	Chronic duodenitis	CS	CM
29	38	WNR	CS	CM
30	30	Chronic duodenitis		WNR
31	34	Slight du0denitis		WNR
32	22	Mild Duodenitis		WNR

CM: cervical myelopathy; CS: cervical spondylosis; OYL: ossification of yellow ligament; WNR: within normal range

2. Conclusion

Atopic dermatitis is not only a disease of the skin, but *Staphylococcus aureus*, which is highly detected from the skin, is greatly involved in its pathology. *Staphylococcus aureus* produces many toxins. The toxin acts as a superantigen and causes damage to many organs. *Staphylococcus aureus* is often detected in the skin of children with atopic dermatitis, and antibodies against toxins in the blood are measured early. Therefore, in patients with atopic dermatitis, it is necessary to pay attention not only to the skin, but also to clinical care that takes into account the disorders of the intestinal tract and cervical spine that have been reported so far.

References

1. White J, Herman A, Pullen AM, Kubo R, Kappler JW, Marrack P. The Vbeta-specifi c superantigen staphylococcal enterotoxin B: stimulation of mature T cells and clonal detection in neonatal mice. Cell. 1989; 56: 17-35.
2. Uchiyama T, Yan XJ, Imanishi K, Yagi L. Bacterial superantigens – Mechanisms of T cell activation by the superantigens and their role in the pathogenesis of infectious disease. Microbiol Immunol. 1994; 38: 245-56.
3. Yamada H, Izutani R, Chihara J, Yudate T, Matsukura M, Tezuka T. RANTES mRNA expression in skin and colon of patients with atopic dermatitis. Int Arch Allergy Immunol. 1996; 111(suppl 1): 19-21.
4. Kira J, Yamasaki K, Kawano Y, Kobayashi T. Acute myelitis associated hyperIgEemia and atopic dermatitis. Neurol Sci. 1997; 148: 199-203.
5. Sugimoto K, Kuroki H, Kanazawa M, Kurosaki T, Abe H, Takahashi Y, et al. New successful treatment with disinfectant for atopic dermatitis. Dermatology. 1997; 195(suppl 2): 62-8.
6. Sugimoto K, Ishikawa N, Sugioka Y, Nakamura M, Koneki H, Nakano M, et al. Isojin disinfectant therapy for atopic dermatitis. Jpn J Pediatr Dermatol. 1998; 17: 103-7.
7. Sugimoto K, Ishikawa, Terano T, Kitsukawa Y, Kubosawa H, Ito S, Hattori T. The importance of bacterial superantigens produced from Staphylococcus aureus in atopic dermatitis. Japan Hifu no Kagaku. 2004; 3(suppl 4): 86-92.
8. Ito S, Hattori T, Fukutake T, Sugimoto K. Is atopic dermatitis a risk factor for intervertebral disc degeneration? A preliminary clinical and MRI study. J Neurol Sci. 2003; 206: 39-42.
9. Kino M, Kojima T, Yamamoto A, Sasal M, Taniuchi S, Kobayashi Y. Bowel wall thickening in infants with food allergy. Pediatr Radiol. 2002; 32: 31-3.
10. Kobayashi T, Glatz M, Horiuchi K, Kawasaki H, Akiyama H, et al. Dysbiosis and Staphylococcus aureus Colonization Drives Inflammation in Atopic Dermatitis. Immunity. 2015; 42: 756-66.
11. Sugimoto K. Staphylococcus aureus vs Atopic Dermatitis. J Pharm Microbiol. 2016; 2: 1-3.
12. Sugimoto K, Hattori T, Kitukawa Y, Aotsuka A, Wada T, Kubosawa H, et al. Significance of Disinfectants for the Treatment of Atopic Dermatitis. J Allergy Ther. 2018; 9: 1-3.
13. Sugimoto K, Hattori T, Kitukawa Y, Aotsuka A, Wada T, et al. Antiseptic Treatment of Povidone-Iodine Solution as a Countermeasure against Staphylococcus Aureus in Atopic Dermatitis. Dermatol Res. 2019; 1(1): 1-3.
14. Sugimoto K, Hattori T, Kitukawa Y, Aotsuka A, Wada T, Kubosawa H, et al. Appropriate Treatment using Povidone-Iodine for Atopic Dermatitis. J Clin Immunol Res Ther. 2021; 1(1): 1-4.
15. Treatment Guidelines for MRSA Infections -Revised Edition- 2019, in Japan.