

Severe Complications of Folk Remedies for Atopic Dermatitis

RYOSUKE INOUE, FUMIAKI MOTOYOSHI, OSAMU FUKUTOMI,
MIYOKO UTSUMI, and NAOMI KONDO

ABSTRACT

Atopic dermatitis (AD) is a chronic disorder, and its course is often punctuated by remissions and relapses despite various treatments, including steroid therapy. Therefore, a tendency exists for the parents to administer to their children various folk remedies, most of which are not medically or scientifically evaluated. In this report, we present the cases of three children with AD who developed severe complications following the administration of folk remedies, the safety of which had been evaluated inadequately. The patient in case 1 had electrolyte abnormalities, in case 2, iron-deficiency anemia, and in case 3, severe hypoproteinemia and electrolyte abnormalities. (Pediatric Asthma Allergy Immunol 1998;12[3]:207–212.)

ATOPIC DERMATITIS (AD) is a pruritic, inflammatory cutaneous disorder found most frequently among patients with a personal or family history of atopic disease. Management includes environmental control, elimination of allergy trigger factors, topical steroids, systemic antibiotics, antihistamines, and hospitalization in severe cases.⁽¹⁾ Topical steroids have been used with great success since the early 1950s.⁽²⁾ However, some parents do not like to use topical steroids for their children because of their side effects. This is the reason they tend to rely on folk remedies, sometimes making the AD worse, owing to inadequate skin care or inappropriate elimination diets.

CASE REPORT

Case 1

A 5-month-old boy was admitted to our hospital for diarrhea of 3 weeks and weight loss. His skin had been dry and inflamed since he was a month old. He had been taken to a dermatologist and his skin lesions improved with the use of a steroid ointment. The skin lesions worsened again, however, on changing to a nonsteroid ointment. His mother then gave him "kampo medicine." She had administered a folk remedy (hot spring bathing) for 3 weeks before visiting our hospital. We learned of the family history of allergic rhinitis in the child's father. Physical examination on admission revealed that the patient weighed 6.2 kg (-1.8 standard deviation [SD]), and was 62.5 cm tall (-1.8 SD). Examinations of the lungs, heart, and abdomen revealed no abnormality. Marked generalized skin dryness was noted. The ichthyotic stage of atopic

Department of Pediatrics, Gifu University School of Medicine, Gifu, Japan.

eczema with erythema and thickened, ridged elephantoid skin was recognized. Laboratory findings revealed leukocytosis, hypoproteinemia with hypogammaglobulinemia, hyponatremia, and hyperkalemia (Table 1). Radioallergosorbent test (RAST) for hen's egg and cow's milk were positive. Other laboratory values, which were obtained and were within normal range included liver transaminases and renal function parameters. Surface marker phenotypes of lymphocytes were within the normal range. The steroid sulfatase level was normal. A culture of the skin yielded *Staphylococcus aureus*, β -hemolytic *streptococcus*, and *Escherichia coli*. The patient was given fluid, electrolytes, albumin, diuretics, antibiotics, and gammaglobulin intravenous (Fig. 1). An elemental diet was given orally. On the sixth hospital day, prednisolone was administered and later tapered gradually. Steroid ointment mixed with white petrolatum jelly was applied and the lesions were bandaged. It took 11 days before the electrolyte levels returned to normal. On the 13th hospital day, as the exudative skin lesions improved, guaiazulene (1,4-dimethyl-7-isopropylazulene) ointment was applied to the skin of the face and neck and the ichthyotic lesions were treated with urea ointment. Disodium cromoglycate was administered orally. The patient was bathed with povidone-iodine. The total serum protein level increased gradually from 3.8 to 5.2 g/dL and the serum albumin level from 2.8 to 3.1 g/dL. On the 40th hospital day, as the skin lesions were improving, the child was discharged and was subsequently managed as an outpatient.

Case 2

A 1-year, 5-month-old boy was admitted to our hospital for fever, cough, and pallor. Although another doctor had been consulted a week prior to admission, the child's symptoms had not improved. He had been treated with ketotifen fumarate, disodium cromoglycate, and theophylline for atopic dermatitis, asthma, and food allergy (hen's egg and milk). As he developed severe dermatitis with itching after eating weaning foods, his mother fed him foods not containing milk, hen's egg, wheat, and meat. An elemental diet had been tried orally at 1 year and 1 month of age, but the atopic skin lesions continued to worsen. No family history of allergic disorders was present. Physical examination on admission revealed a small, thin boy who weighed 7 kg (-3 SD) and was 67.5 cm tall (-4.8 SD). The throat was injected and he had wheezing, but heart and abdomen examination revealed no abnormality. Skin pallor was present and AD was recognized. As shown in the Table, laboratory data on admission revealed severe anemia and leukocytosis. Serum IgE levels were extremely high. Antigen-specific IgE levels for hen's egg, cow's milk, pork, beef, and chicken were positive. The serum C-reactive protein level was elevated. Serum iron level was 5 μ g/dL, with a serum

TABLE 1. LABORATORY DATA ON ADMISSION

	Case 1		Case 2	Case 3	Controls
	Age	5 months	1 year 5 months	6 months	0-2 years
Hematologic values					
Red blood cell count ($\times 10^4/\mu$ L)		516	303	462	391-482
Hemoglobin (g/dL)		12.4	4.3	11.9	11.6-14.0
Hematocrit (%)		38.4	16.7	36.5	32.7-42.6
White blood cell count ($/\mu$ L)		25,500	18,400	15,900	5,000-17,000
Platelet count ($\times 10^4/\mu$ L)		102.5	71.8	125.5	12.0-35.0
Blood chemical values					
Total protein (g/dL)		3.8	7.7	5.4	5.6-7.6
Albumin (g/dL)		2.8	4.1	3.4	3.5-5.5
Sodium (mmol/L)		124	137	117	137-141
Potassium (mmol/L)		5.5	3.0	5.8	3.5-4.5
Chloride (mmol/L)		95	100	87	95-105
Serum immunoglobulin levels					
IgE (IU/L)		204.3	25,555	480.6	<200

SEVERE COMPLICATIONS OF AD

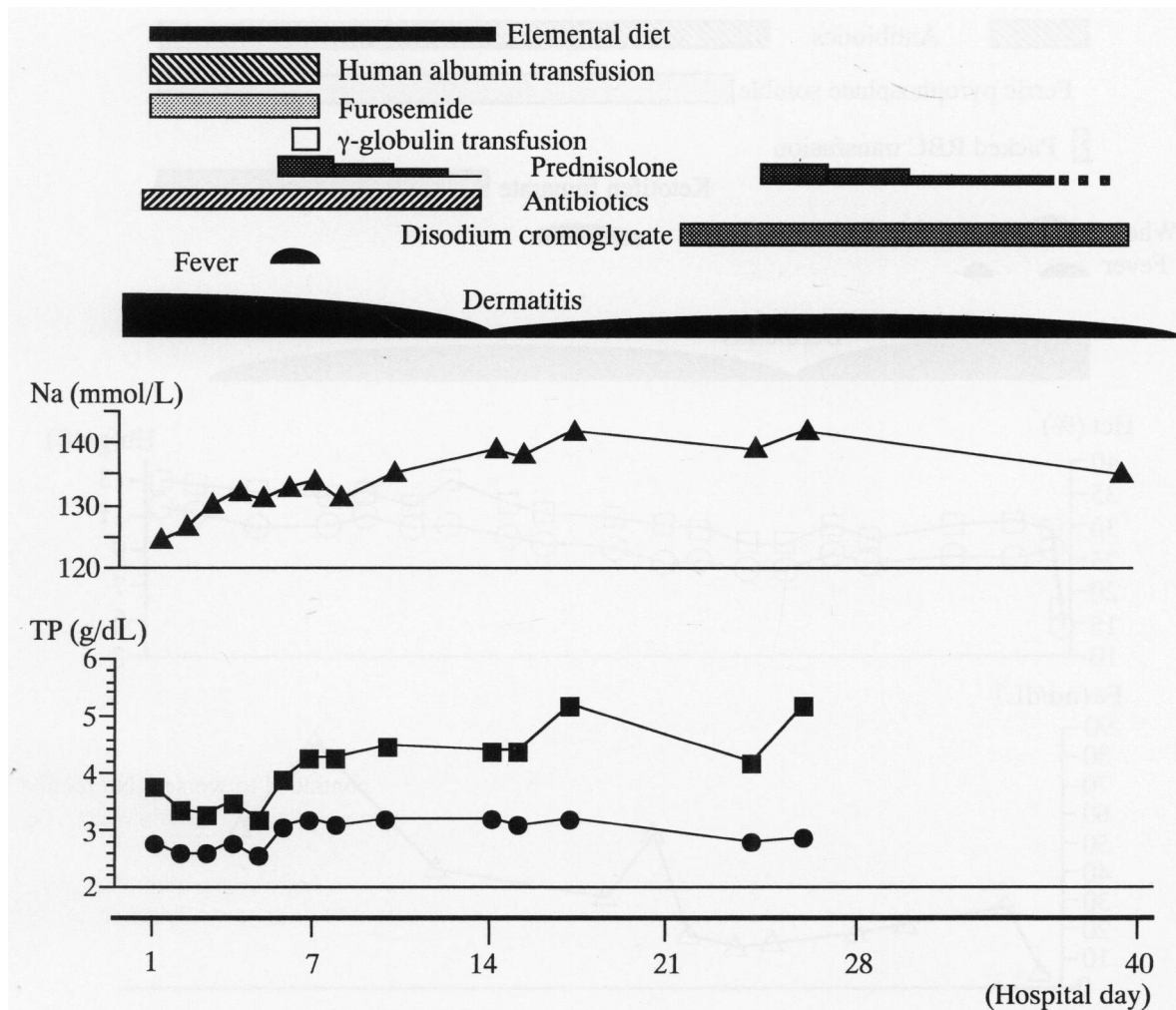


FIG. 1. Clinical course of case 1. ▲, plasma sodium levels; ■, total protein levels; ●, plasma albumin levels.

iron-binding capacity of 523 $\mu\text{g/dL}$ and serum ferritin level of 5.7 $\mu\text{g/L}$. Other normal laboratory values obtained included total protein, IgG, electrolytes, liver transaminases, and renal function parameters. Stool test was negative for occult blood. Specific antibody test against *S. aureus* was negative. The patient was given fluid and antibiotics intravenously (Fig. 2). Packed red cells were transfused. A restricted diet without cow's milk, hen's egg, wheat, and sardines was given. The appropriate diet control reduced his itching and scratching, and improved his appetite. The exudative skin lesions were disinfected with povidone-iodine and treated with an ointment. On the 16th hospital day, soluble ferric pyrophosphate was administered orally. His hemoglobin levels and atopic skin lesions improved and he was discharged on the 76th hospital day.

Case 3

A 6-month-old girl was admitted to our hospital for hypoproteinemia, hypogammaglobulinemia, and severe atopic dermatitis. Her mother had treated her with folk medicines (acidic electrolytic water spray). She had consulted another doctor 2 months prior to admission, who prescribed a nonsteroid ointment. One month before admission, the blood abnormalities on laboratory examination were diagnosed at the previous clinic. Physical examination on admission revealed that the patient weighed 6.7 kg (-1.1 SD) and was 65 cm tall (-0.4 SD), and peripheral edema was present. The atopic skin lesions were severe; exudation such as that

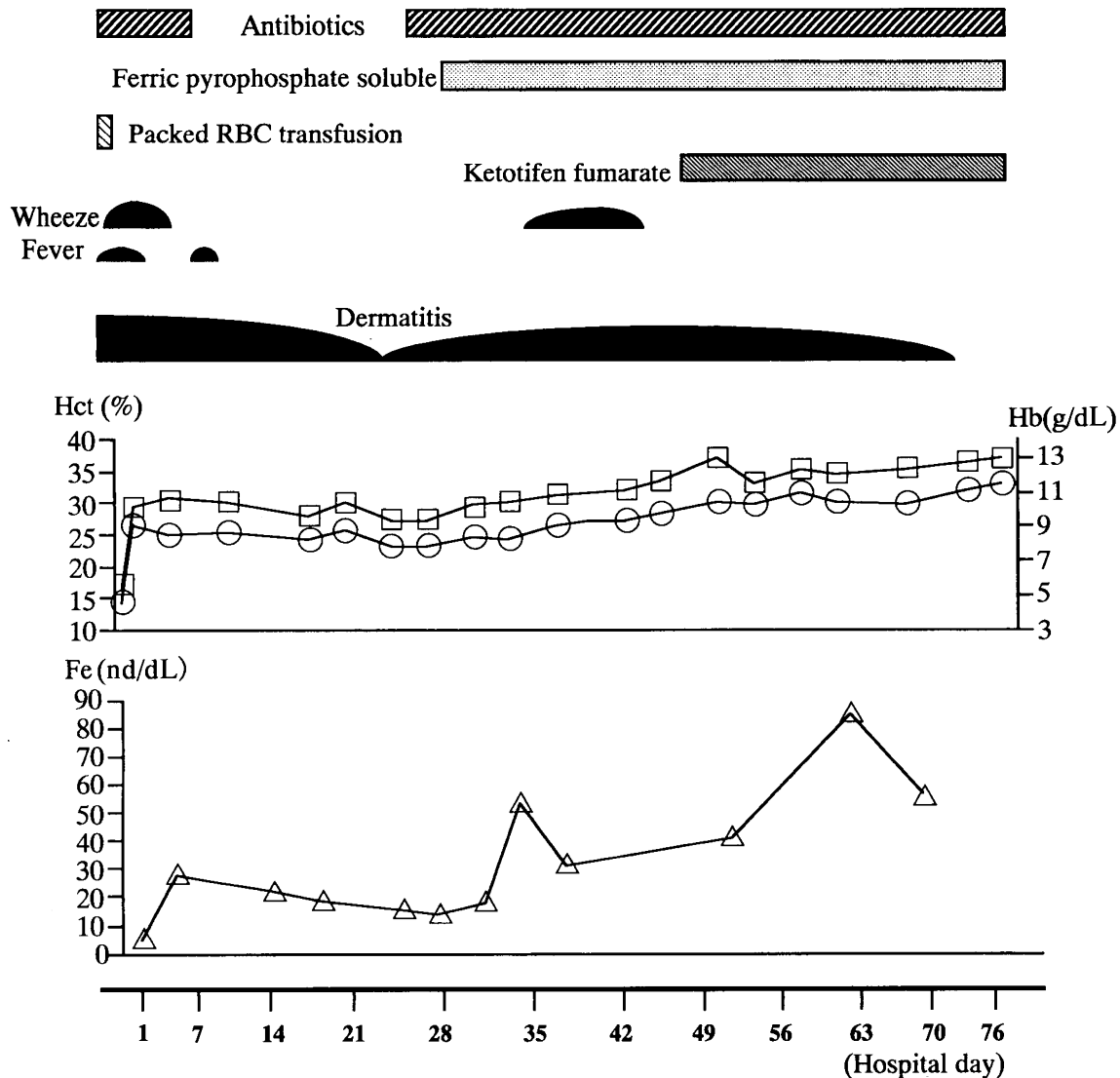


FIG. 2. Clinical course of case 2. RBC, red blood cells; ○, hemoglobin level; □, hematocrit; △, serum iron levels.

seen in burn injuries was present in the skin lesions. Throat, lung, heart, and abdomen examination revealed no abnormality. Laboratory values on admission (Table 1) revealed leukocytosis with eosinophilia (26.4% of eosinophils), elevated platelet count, hyponatremia, hypoproteinemia with hypoalbuminemia, and hypogammaglobulinemia. Serum IgE levels were high, and RAST (radioallergosorbent test) for hen's egg and cow's milk were positive. Skin culture yielded *S. aureus* and *S. epidermidis*. The child was given fluid, electrolytes, diuretics, and antibiotics intravenously and bathed with povidone-iodine. The skin lesions were treated by the application of gentamicin ointment or heparinoids, and bandaged. The electrolyte levels returned to normal during the first 7 days of treatment. However, as hypoproteinemia worsened (2.8 g/dL) on the fifth hospital day, albumin was given intravenously and it took 2 weeks for the serum albumin level to return to normal (Fig. 3). The exudative eczematous lesions were disinfected with povidone-iodine. Steroid ointment application was initiated on the seventh hospital day. Oxatomide was administered orally. The serum IgG concentrations increased gradually without specific treatment after admission. The course was punctuated by several remissions and relapses of the skin lesions, and the child was discharged on the 29th hospital day.

DISCUSSION

Among the complications of AD, secondary infection of the lesions with bacteria (staphylococci and β -hemolytic streptococci) or viruses (herpes simplex and molluscum contagiosum virus) is the most well known. It is also observed that keratoconus is occasionally seen in these children.⁽³⁾ However, electrolyte abnormalities or anemia have been reported only rarely. The serum sodium level is most commonly reduced as a result of either sodium depletion or water "intoxication" or a combination of both. It may have caused the hyponatremia in case 1. Malnutrition in addition to diarrhea probably induced expansion of the extracellular space by water. In Case 3, exudation such as that seen in burn injuries was present in the skin lesions; therefore the increased permeability of the skin lesions is thought to be accompanied by the loss of water, electrolytes, and proteins from the vessels into the interstitial tissue. Anemia caused by inadequate dietary iron is common from age 9 to 24 months.⁽⁴⁾ In general, infants with severe iron deficiency may have chronic intestinal bleeding. In rare cases, iron malabsorption, presumably caused by iron deficiency or abnormal metabolism and/or abnormal ferritin, has been reported.⁽⁵⁾ Because no occult blood was found in the stool and recovery of hemoglobin levels was favorable, restricted diet was continued in Case 2. In this case, anemia should be caused by insufficient taking of dietary iron. Antiseptics are frequently added to bath water as a measure against staphylococcal cross-infection in the treatment of staphylococcal carriers.⁽⁶⁾ The

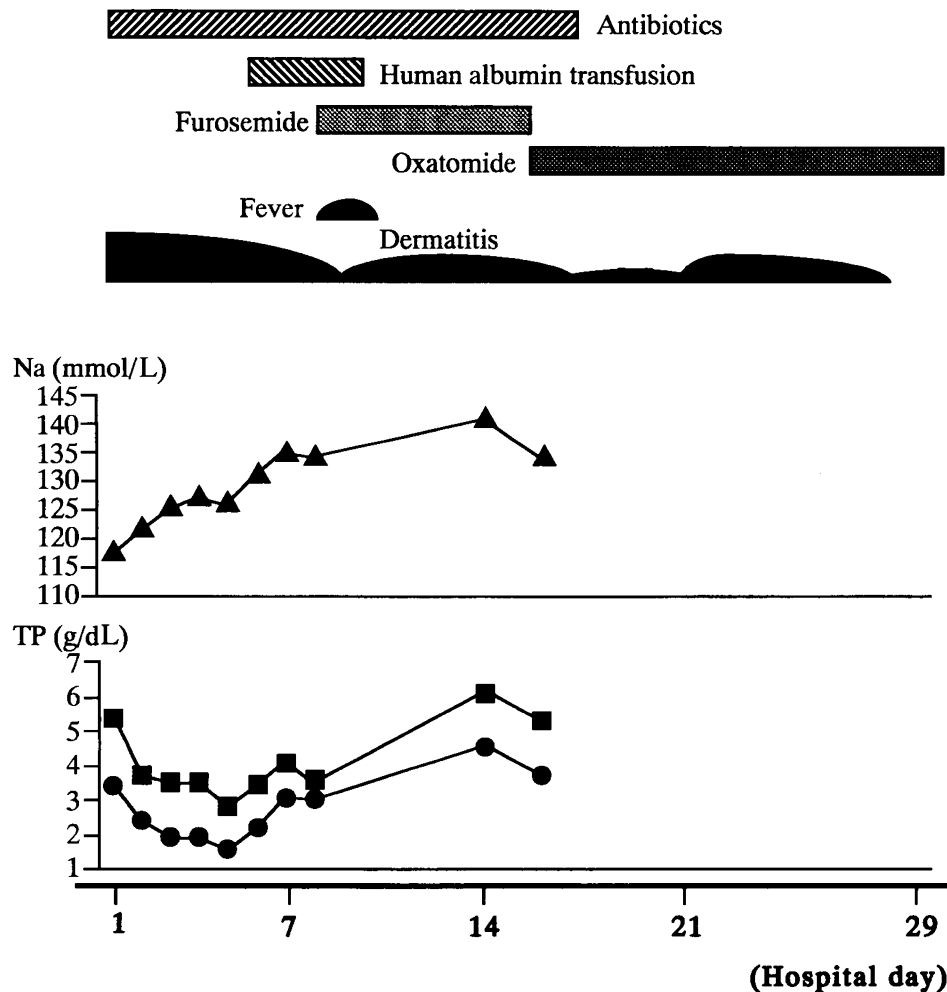


FIG. 3. Clinical course of case 3. ▲, plasma sodium levels; ■, total protein levels; ●, plasma albumin levels.

effect on the skin flora of bathing with antiseptic solutions has been reported previously.⁽⁷⁾ This treatment was so effective in our cases that *S. aureus* infection was considered to be the major organism complicating the skin lesions.

It is important that the skin is kept clean at all times. However, excessive use of disinfectants kills the normal flora of the skin, which keep the surface of the skin weakly acidic and protect it from pathogenic bacteria. Moreover, it should be considered that the disinfectant itself may cause a rash due to chemical inflammation.

The evaluation of folk remedies is difficult. Undernourishment is an important problem in infants. In these three cases, inadequately restricted diet, self-administered folk remedies, or both are considered to have caused the serious complications. Comprehensive care by the doctor, nurse, counselor, and nutritional adviser is important in the treatment of AD refractory to treatment.

REFERENCES

1. Hanifin JM. Recognizing and managing clinical problems in atopic dermatitis. *Allergy Proc* 1989;10(6):397–402.
2. Krafchik BR. The use of topical steroids in children. *Semin Dermatol* 1995;14(1):70–74.
3. Sly RM. Atopic dermatitis, in Behrman RE, Kliegman RM, eds. *Nelson textbook of pediatrics*, 14th ed. Philadelphia: WB Saunders, 1992:596–599.
4. Stockman III JA. Iron deficiency anemia, in Behrman RE, Kliegman RM, eds. *Nelson textbook of pediatrics*, 14th ed, Philadelphia: WB Saunders, 1992:1239–1241.
5. Ovaert C, Bachy A. Iron deficiency anemia is not always simple. *Arch Fr Pediatr* 1993;50(8):697–699.
6. Gillespie WA, Alder VG, Ayliffe GAJ, Powell DEB, Wypkema W. Control of cross-infection in surgical wards. *Lancet* 1961;i:1299–1303.
7. Davies J, Babb JR, Ayliffe GAJ. The effect on the skin flora of bathing with antiseptic solutions. *J Antimicrobial Chemother* 1977;3:473–481.

Address reprint requests to:
Dr. Ryosuke Inoue
Department of Pediatrics
Gifu University School of Medicine
Tsukasa-machi 40
Gifu 500, Japan

This article has been cited by:

1. 1998. Literature WatchLiterature Watch. *Pediatric Asthma, Allergy & Immunology* **12**:4, 277-291. [[Citation](#)] [[PDF](#)] [[PDF Plus](#)]