



Probiotics-Induced Acute Urticaria in a Pediatric Patient: A Case Report

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Abstract

Background: Acute urticaria is a suddenly developed pruritus, pale red bump on the skin as a result of an allergic reaction which is triggered by a stimulus, such as a drug and can be disappeared within 48 hours. Probiotics are host-friendly live microorganisms those can restrengthen the intestinal microbial flora and are widely used mostly in the management of acute diarrhea. Probiotics-induced adverse drug reactions like, urticaria is an unusual incidence and here we found an event of probiotics-induced acute urticaria.

Case Description: An 18-month-old pediatric patient was suffering from diarrhea for last 2 days and took the consultation of a doctor. He was prescribed with probiotics (a combination of *Lactobacillus acidophilus*-2 billion, *Lactobacillus bulgaricus*-1 billion and *Bifidobacterium bifidum*-1 billion) at a dose: one capsule per day orally. On the day one, the patient was experienced with probiotics-induced acute urticaria just after 3 and half hour of ingestion, and most of the symptoms of urticaria were resolved within 4 hr to 5 hrs without any anti-allergy medication. Same incidence happened in the second day. As per the doctor's advice, probiotics were discontinued and he was not experienced with any allergic reaction, after that.

Conclusion: Any drug may be treated as an allergen by a living human body and consequently, may develop allergic reactions such as, urticaria. Although, probiotics are considered as safe drugs, but in our case, we found a usual probiotics-induced acute urticaria case in a pediatric patient.

Keywords: Acute Urticaria; Probiotics; Adverse Drug Reaction

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Introduction

Acute urticaria, also known as hives, characterized by episodic, pale red, pruritic edematous lesions (wheals) on the skin, as a result of body's unpleasant symptomatic response to an allergen with or without a known etiology [1]. Urticaria is the second most common cutaneous manifestation of adverse reaction after maculopapular drug eruption and occurs in 15% to 25% peoples at any stage of life [1,2]. Probiotics are host friendly live microorganisms that are helpful for reestablishing host's beneficial microbial flora in the digestive system and this concept was established in the 20th century through a hypothesis proposed by a Russian scientist and won a Nobel Prize. Both the World Health Organization (WHO) and the Food and Agriculture Organization (FAO) of the United Nations (UN) have uniquely defined probiotics as 'live microorganisms, which, when administered in adequate amounts, confer a health benefit on the host' [5]. Probiotics, such as *L. acidophilus*, *L. bulgaricus* and *B. bifidum* are widely used as probiotics [6] and adverse reaction with any of these probiotics is not recorded to date. We found a case of acute urticaria (an adverse drug reaction) followed by the oral administration of above mentioned probiotics in a pediatric patient.

Case Presentation

A 18-month-old healthy male pediatric (toddler) patient went to a doctor (out-door) of a tertiary level hospital in Dhaka, Bangladesh with the complain of loose stool, persistently occurred for last 2 days with a frequency of 3-4 times a day and only oral rehydration saline (ORS) was administered in home. During consultation, doctor prescribed a probiotic combination in hard capsule form containing *L. acidophilus* (2 billion), *L. bulgaricus* (1 billion) and *B. bifidum* (1 billion), at a dose: one capsule once a day, orally for the next 10 days for the treatment of diarrhea. Adequate ORS intake was advised for rehydration in the prescription. On that day, patient's body weight was



Figure 1: Probiotics-induced urticaria on back.

10.8 Kg, blood pressure was 100 over 55 mmHg and pulse rate was 120 beats per minute. The patient took the first dose (1 capsule) of the probiotics in the afternoon of the same day. After about 3 and half hour of administration, he developed acute urticaria characterized by pale red wheals with itchy and swelled feature, mostly in the chest and back (Figure 1). Patient looked fatigue. About 4 hr to 5 hours later, most of the pale red wheals were disappeared and itchiness reduced, significantly without taking any medication for that allergic reaction. The patient's parents were confused with that incidence of the first day and again experienced with the same incidence on the second day with probiotics (Figure 1), which was again resolved after 4 hr to 5 hrs of ingestion without any sequelae except, mild itchiness in the chest and back. On the third day, parents avoided the ingestion of probiotics to their child and took him to doctor, immediately. His probiotic was stopped and by this time, his diarrhea was resolved. The pediatric patient was prescribed with syrup Chlorpheniramine Maleate (1 mg twice a day, orally) for his mild itchiness and he had not been experienced with any allergic symptom in the following days.

Discussion

Urticaria is an unpleasant adverse cutaneous reaction that may occur without any perception with a prevalence of 0.5% to 1% in population. The primary symptom of urticaria is pruritus. According to the symptoms' duration of stay and presence of stimulus/antigen, urticaria is generally classified as acute, chronic and physical [7]. Any urticaria, size ranges from few millimeters to several centimeters in diameter, lasts for less than 6 weeks called, acute urticaria [7]. In some cases, skin lesions may last for less than 48 hrs [1]. It appears suddenly in response to a trigger, which may be a viral infection or an allergen, such as drug, food and insect [7]. Drug-induced urticaria is seen in 9% of out-door patients in dermatology department and mostly reported against the most common drugs, such as penicillins, non-steroidal anti-inflammatory drugs, sulfonamides and Fluoroquinolones [8]. Urticaria mostly occurs in the range of 20-40 years of age. Urticaria with a deeper swelling is called, angioedema. Generally, urticaria is occurred due to the activation of mast cell by both immunologic and non-immunologic mechanisms, which causes the release of inflammatory mediators, such as cytokines, histamine, leukotrienes and prostaglandins. These mediators increase vascular permeability which as a result, develops edema and pruritus. Mast cells are widely distributed throughout the body and possess Immunoglobulin E (IgE) receptors [7]. A study on 411 pediatric patients found that 76.4 % patients are experienced with acute urticaria [9]. Approximately 30% urticarias are chronic [1]. An acute urticaria was observed in that pediatric patient with mild angiedema and severe pruritus, and

resolved within a period of less than 48 hrs.

A data analysis report showed that drug-induced urticaria and fixed drug rashes are most frequently occurred with carbamazepine (16.23%), phenytoin (15.15%) and cotrimoxazole (13.53%) [10]. The age of the patients is an important factor for occurring any type of cutaneous drug eruptions. Geriatric patients, boys younger than 3 years and girls older than 9 years have been found more susceptible to drug-induced skin eruptions. Several factors of the culprit drugs are responsible for the skin eruption likes, urticaria and factors are: route of administration, dose of the drug, frequency of dosing, duration and drug-metabolism pathways [11]. In the current case, urticaria was developed in that boy with the ingestion of oral probiotics, significantly.

Probiotics are orally ingestible and nondigestible drug products that help to reestablish the naturally developed beneficiary host-microbiota in the digestive tract and synbiotics are formed when probiotics included in the current intestinal microbiota [12]. Hundreds of different bacterial species are living in the intestine and among the intestinal microbes, those are beneficial for host's health, are termed as probiotics. Probiotics strengthen the gastrointestinal microbial flora, boost-up the immune system, and reduce serum cholesterol, cancer prevention and son on [6]. Bacteria from *Lactobacillus* or *Bifidobacterium* groups are widely used as probiotics. *L. acidophilus*, *L. bulgaricus* and *B. bifidum* are found with good potentiality as probiotics [6,12] and in this case, the pediatric patient found the probiotics preparation in the same combination. Considering all the studies on probiotics, it is believed that probiotics are safe, non-pathogenic beneficial organisms and that is why, globally, different combination of probiotics is used in the management of diarrheal diseases. Recently, probiotics are considered as the cost-effective, potential first line treatment option for managing acute viral diarrhea (specially, in the pediatric patients), recurrent *Clostridium difficile* diarrhea and antibiotic-induced diarrhea [6,12]. Epidemiological studies showed that bacteremia and sepsis is very rare with lactobacilli. To date, probiotics-induced no adverse reaction report or health hazard has been reported, worldwide [12]. This may be the first clinical case of *L. acidophilus*, *L. bulgaricus* and *B. bifidum* induced adverse drug reaction (acute urticaria) that was observed in a pediatric patient.

Conclusion

Probiotics are safe and potential drug for strengthening hosts' intestinal beneficial microbial flora. Probiotics-induced adverse drug reaction is an unusual incidence to date. However, in this case, a pediatric patient was experienced with a probiotics-induced acute urticaria event.

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