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Outbreak of Insect exposed Dermatitis in Yavatmal District

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Abstract

Background: Cotton related issues are the prime focus in the farmers' suicide district of Yavatmal. Sudden outbreaks of skin related issues affects morbidity of the farmers. We came across such skin related outbreak in our Department of Dermatology, Venereology and Leprosy, at Shri Vasantrao Naik Government Medical College, Yavatmal.

Aims and Objectives: To study the demography, morphology, cause and treatment of sudden outbreak of insect exposed dermatitis.

Methods: Total 437 patients, who complaining of itching after exposed to cotton, were included in the study. Detailed history regarding exposure to cotton, other family members or neighbours affected were taken. A detailed clinical examination, skin scrapping and biopsy of patients were done. Field surveys were done to assess the cause of dermatitis. Patients were managed with proper treatment and follow up done at regular interval.

Results: Out of total patients, 247 were male and 190 were female. Age of the patients ranged from 5-55 years. The main presenting symptoms were itching to affected parts or whole body part, appearance of red spots, bumps or swelling. Clinical examination found that insect was the main cause of skin allergy. Patients were treated with oral antihistamines, topical steroid, calamine lotion and if required oral coticosteroids.

Conclusions: Insect exposed dermattitis is not uncommon entity, but till date there are no literature found to report this entity as an epidemic in the farmer in the rural part of Maharashtra. Proper personal care, proper stoarage of cotton, mass education can to some extent prevent such types of epidemic in future.

Keywords: Outbreak, Insect, Dermatitis, Itching, Cotton, Biopsy, Antihistamines, Coticosteroids

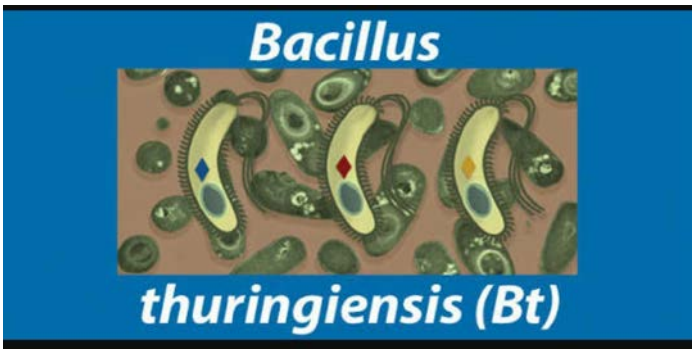
Introduction

Cotton is one of the most important economic crops worldwide. In 2006, it was grown in 75 countries with a total production of 27 billion kilograms, and supplied almost 40% of the global demand for fiber [1,2]. However, India ranks third in global cotton production after USA and China. India accounts for approximately 25 percent of world's total cotton area and 16 percent of global cotton production [3].

Cotton area was on the decline in India because of frequent bollworm infestation and outbreaks. The area declined from an average of 87 lakh hectares upto 2001 to a meager 78 lakh hectares in 2002 and 2003. With the

advent of Bt-cotton, the area increased to 121.91 lakh hectares in 2011. Thus there was an additional increase of at least 30 lakh hectares because of the introduction of Bt-cotton. Bt cotton is genetically modified cotton crop that expresses an insecticidal protein whose gene has been derived from a soil bacterium called Bacillus thuringiensis, commonly referred as Bt, (Image 1) [4]. Bt cotton was introduced in North India in 2005 and the yields were already high in these states. However biggest gains were made in Gujarat, Maharashtra and AP. There is a huge demand characterized by long farmer queues each year for Bt-cotton seeds of specific brands.

Image 1: BT Cotton



Maharashtra is the largest cotton growing state in the country. It covers about 34% of total cotton area and contributes 17% of the production [srmh.pdf]. In Maharashtra cotton is cultivated in 27 districts out of which Bt. Cotton seeds were distributed in 19 districts [3]. Vidarbha region is considered as the major cotton-growing region in Maharashtra state, because it covers nearly half of the area of cotton in Maharashtra. Among Vidarbha region Yavatmal is the main district of cultivation of cotton [5]. The cotton production in Yavatmal faces many constrains most important of which is the problem of insect pests. Farmworkers and mill employes have experienced arthopod (insect) borne urticarial/allergic reaction, bite reaction, borne papular urticarial and insect exposed dermatitis. Many farmers reported allergic reactions to Bt cotton, (Image 2), such reaction are severe itching of the skin, swollen apparatus, white eruptions on the skin, upper respiratory problems. Insect exposed dermattitis is not uncommon entity, but it has never been reported as an epidemic in the literature. We are the first to report this entity as an epidemic in the farmer in the rural part of Maharashtra.

Image 2: Allergic Reactions from BT Crops in Farmers

Materials and Methods

All the patients visiting Dermatology outpatient Department of SVNGMC, Yavatmal and who were attending Special camp at Ralegaon Rural Hospital, with complaint of itching after exposed to cotton were included in the study. Total 437 patients were included in this study. A detailed history regarding exposure to cotton, other family members or neighbours affected were taken. Complete and detailed clinical examination, skin scrapping and Biopsy of patients were done. Field surveys were done to assess the cause of dermatitis. Management of patients was done and patients were following up at regular intervals.

Results and Discussion

In the present study, total 437 patients presented with the complaint of itching after exposed to cotton (Image 3- some patients with itching) were included, out of which 247 were male and 190 were female. The age of the patients were ranged from 5-55 years.

Image 3: Patients with complaint of itching after exposed to cotton

Act of Bt Cotton on Farmers' Health in Barwani and Dhar District of Madhya Pradesh, was conducted between October and December 2005. From this press report: Dr. Gurpiar Singh told that poisonous types of genes have been used in the Bt cotton that's why the farmers and the laborers are affected most. The team further revealed, the toxins inside the Bt cotton seed which helps the cotton plant fight the deadly American Bollworm, was the main reason behind the allergy. Dr Gupta said that all respondents had itching of skin, while 86 pct of them had eruptions on body and 56 pct had swelling of face where as in some cases, the itching was so severe that they had to discontinue their work, or had to work after taking anti-allergy medicine [6].

The survey resulted in a report which concluded [6]: "All the evidence gathered during the investigation shows that Bt has been causing skin, upper respiratory tract and eye allergy among persons exposed to cotton. The allergy is not restricted to farm labourers involved in picking cotton but has affected labourers involved in loading and unloading Bt from villages to market, those involved in its weighing, labourers working in ginning factories, people who carried out other operations in the field of Bt cotton, or farmers who stored cotton in their homes etc." Similar to this report, the infected patients in the present study were shown in table 1 with their symptoms.

Table 1: Infected person and symptoms

Infected Persons	Symptoms
• Farmers and their family members • Cotton handling farmworkers • Farmers who stored cotton in their homes or their neighbors • Labours working in ginning factory or mills	• Itching to affected parts or whole body part • Appearance of red spots, bumps or swelling • Appearance of above symptoms to other family members or neighbors

A detailed clinical examination was done for all the patients to find out the causes of itching, (Image 4). Itching occurs may be exposed to cotton, pink bollworm, insecticide, and insect. The clinical examination reveals that the insect was the main cause of skin allergy.

Image 4: Clinical Examination

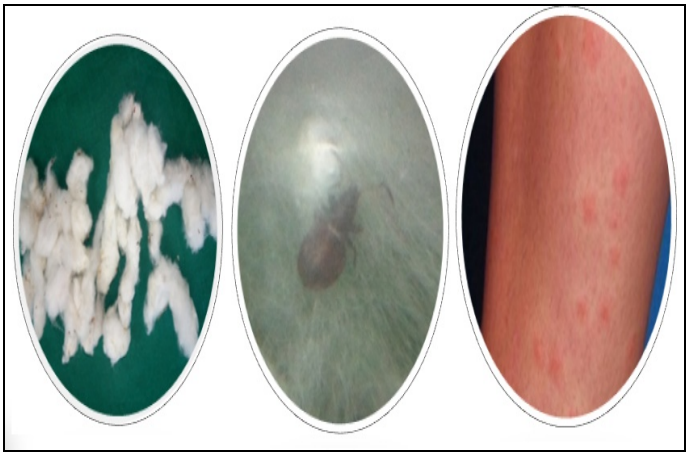
Insects are arthropods of the class Insecta. Insects can be distinguished from other arthropods by the presence of 3 body segments, a pair of antennae, and 6 legs [7]. It represents more than half of all known living organisms and potentially represents more than 90% of the differing life forms on Earth. Hence, human contact with insects is unavoidable. Exposure to biting or stinging insects or to

their remains can range in severity from benign or barely noticeable to life threatening [8].

Insect bites and stings can be divided into two groups' i.e. venomous and non-venomous. Non-venomous insects (Mosquito, Flea, Tick, Bed bug, Louse, Scabies, Caterpillars and moths) pierce the skin to feed on blood, this usually results in intense itching. Some caterpillars and moths have irritating hairs and sharp spines, causing stinging, short-lasting papular urticaria, and dermatitis. The clinical features of arthropod bites and stings shows the allergic reaction depends on the species involved, whether it carries disease, and individual factors such as host immunity. A venomous sting from a bee or wasp usually causes a stinging sensation or pain with redness and swelling of the area. Sensitization to the venom affects response. A large localized reaction causes swelling to spread more widely over several hours. Anaphylaxis results in immediate angioedema, urticaria and bronchospasm and can be life-threatening. An insect bite presents as one or more intensely itchy papules on a body site exposed to the insect. Insect bites often arise in crops. The papule usually subsides within a few hours. It may have a central clear or haemorrhagic blister and persist for several days. Scratching results in an open sore [9].

Arthropod-related skin diseases have been reported in frequent travelers up to the extent of 31% of all skin diagnosis and insect bite including super infected bites abscesses, and allergic reactions account for 38% of the cases [7]. However, such a co-relation was not a part of our study. Moreover, insect exposed dermattitis is the type of hypersensitivity reaction to insect bite, (Image 5) and this dermatitis needs to be differentiated from other dermatological conditions like atopic dermatitis, contact dermatitis, impetigo, mycosis fungoides, scabies etc. There have been reports of patients developing a generalized reaction to an insect bite as with the bites of sand fly, chigger bite, ticks, kissing bugs, etc., but none such case was reported in our study [10]. Yet many species inject saliva while biting. Most lesions are the result of the victim's immune response to these secretions. Most cases are not even reported. Most does not require hospital care as well. Most insects are minor and cause only superficial puncture wounds to the skin. Papular Urticaria presents with clusters or crop of itchy red papules with / without vesiculation on top of it (urticated papules). Few may have bullous lesions especially those exposed to new insects. Also these eruptions may be seasonal.

Image 5: Insect Exposed Dermatitis



A complication of arthropod bites includes secondary infection with staphylococci and/or streptococci (impetigo, cellulitis), papular urticarial, persistent insect bite reaction and arthropod-borne infection. Papular urticaria is hypersensitivity reaction, due to insects, fleabites, and/or mosquito bites. New bites are accompanied by reactivation of old ones and present as symmetrical crops of itchy urticated papules, resolves with the development of immunological tolerance. Solitary persistent insect bite reactions can be Urticarial, Bullous, Vasculitic and Granulomatous [9].

Generally people are aware of bites, especially if they have observed the arthropod, but occasionally they are not. The clinical appearance is usually typical. Skin biopsy is suggestive if it shows central punctum, eosinophilic spongiosis and wedge-shaped mixed dermal infiltrate distributed around the sweat ducts/glands. Mostly diagnosis is made on clinical features and history. The main treatment aim of insect bites is to prevent itching and cool the affected area [9]. In the present study, patients were treated with oral antihistamines, topical steroid, calamine lotion and if required oral coticosteroids. Oral antihistamine reduces itch and wheals (Mainstay of treatment). The moderate potency topical steroids were used for papular urticaria or persistent reactions.

Conclusion

Insect exposed dermattitis is not uncommon entity, but till date there are no literature found to report this entity as an epidemic in the farmer in the rural part of Maharashtra. Personal and surrounding hygiene (Garbage odours can attract insect), proper storage of cotton, wearing of fully covering cloths, keeping windows and doors closed at night and mass education can to some extent prevent such types of epidemic in future. If possible**,** consult doctor immediately, if such itching symptoms occur.

The present study suggested that there is a need to spread awareness in cotton growing regions about the allergic characteristic of the plant so that people can identify the cause and take preventive measures. Also suggested to conduct a detailed investigation into the matter and take necessary measures to stop the allergies eruption.

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