Epidemiological Study of Insects Bite Reaction From Pune City

***Dr. Shakera A. Inamdar and Samhinta S. Badave.**

Modern College of Arts, Science and Commerce, Ganeshkhind, Pune.

Introduction

Arthropods produce an injury to the skin by a variety of mechanisms; one or more of which may be involved in an individual case. Moisture, warmth, carbon dioxide, estrogens and lactic acid in sweat are among various factors that have been found to attract mosquitoes. The important species that molest man belong to 4 families: Apidae, Bombidae (bees), Vespidae (wasps), Formicidae (ants). The physical effects of the arthropod bites on human skin receive less attention, especially in the rural areas where the per capita income is less.Whether we are hiking in the mountains or playing in our backyard, we run the risk of exposure to the offended arthropods. The number of skin disorders caused by arthropods varies from trivial bites and stings to severe systemic reactions and even death.

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Population studies suggest that approximately 1/3rd of the individuals suffering from systemic reactions have a personal history of atopic disease. Large local reactions are swellings exceeding a diameter of 10 cm and lasting longer than 24 hrs, with an occasional blister.

Certain occupations may carry an increased risk of reactions to arthropods. Forestry workers, for example, may be exposed to the urticating hair of caterpillars of certain species of Lepidoptera, and dock workers handling food stuffs may be attacked by mites infesting the cargo. Also, pregnant women appear more attractive to mosquitoes than the non-pregnant.

1 Dermatology :

Dermatology is the branch of medicine dealing with the skin, nails, hair and its diseases. It is a specialty with both medical and surgical aspects. A dermatologist treats diseases, in the widest sense, and some cosmetic problems of the skin, scalp, hair, and nails.

Dermatology involves study, research, and diagnosis of normal and disorders, diseases, cancers, cosmetic and ageing conditions of the skin, fat, hair, nails and oral and genital membranes, and the management of these by different investigations and therapies, including but not limited to dermatohistopathology, topical and systemic medications,

dermatologic surgery and dermatologic cosmetic surgery, immunotherapy, phototherapy, laser therapy, radiotherapy and photodynamic therapy.

2 Dermatitis :

Dermatitis, also known as eczema is a group of diseases that results in inflammation of the skin. These diseases are characterized by itchiness, red skin, and a rash. In cases of short duration there may be small blisters while in long-term cases the skin may become thickened.

In insect bite, these characters like itching, red skin and rash are common therefore it is known as insect bite dermatitis.

3 Species attacking humans:

Insects are small animals with six legs and a hard protective outer shell called an exoskeleton. Most insects have wings and antennae. They belong to the Phylum Arthropoda which contains more sub groups (species) than any other grouping of animals.

Mosquitoes, flies, ticks and fleas are the main cause of bites and stings. These insects occur worldwide and may transmit diseases. Some insects are found only in certain geographic

locations. Most people experience occasional stings and bites but after natural disasters such as floods and storms, the numbers of bites and stings are often greatly increased.

The following list shows the main insect groups whose bites can cause reactions in the skin and which may transmit diseases.

Biting flies and mosquitoes:

This group includes various types of species of flies and mosquito. It is a major group of insect which can cause dermatitis.

Bees, Wasps, Hornets and Ants :

Stings by members of this group may cause anaphylaxis. In fact, the stings by this group of insects cause an estimated 25% of all cases of anaphylaxis.

Fleas:

The flea is the most common cause of problems in humans. Bites from fleas look like groups of red itchy bumps on the body. Some lesions may blister. Fleas can transmit diseases such as typhus.

Lice:

Lice are wingless insects that cause head, body or pubic lice infestations.

Mites:

Scabies is caused by infestation of the surface layer of the skin (epidermis) by *Sarcoptesscabei* that infests only humans. The insect most frequently burrows into the skin of the web spaces of the hands and around the wrists. Most, but not all, infected individuals become allergic to the presence of the mite and develop groups of itchy red lumps over time, involving web spaces of hands, on elbows, around the edges of the armpits, around the nipples, buttocks and genital area. The itchiness is frequently worse at night and may interrupt sleep.

Bedbugs:

These are bloodsucking insects that bite at night producing rows of red swollen lumps where they contact the skin.

Cause of reaction:

The venom injected into the body from the bite or sting of an insect will cause the immune system to respond. Often, body's immediate response will include redness and swelling at the site of the bite or sting. Minor delayed reactions include itching and soreness.If someoneis very sensitive to an insect's venom, bites and stings can cause a potentially fatal condition called anaphylactic shock, which can cause the throat to tighten and make breathing difficult.Some bites and stings may cause illnesses when venom contains infectious agents.

Methodology

1. Selection of area of survey. Selected Satara city as rural area and Pune city as an urban area.
2. The study is being carried out in the clinic of skin specialist Dr. Rohan Patil. (M.B.B.S. DVD.), Satara.
3. 20 patients of insect bite reaction are studied during the month of September- October-November 2017.
4. The history of patients were taken and case study was done.
5. Collection of photographs of insect bite reactions of patients.
6. Further study will carry out in the clinic of Dr. Kshitendra Krishna.(M.D. Skin), Pune.
7. After the collection of data, the statistical analysis will carry out.

Results :

Individuals vary widely in their response to the bite of a particular insect, but for the most bites of different species, there is a high degree of similarity. Accordingly, it is difficult to determine the responsible species on the basis of the appearance of the lesion. There are, however, important clues that a particular eruption is probably caused by an insect. The frequency of chief complains of itching, burning, and pain as per the questionnaire used in the study.

In Satara region which is rural area, there are 6 species of insect found abundantly which are causing insect bite dermatitis.

The species which are causing dermatit is :

1. Mosquitoes (Anopheles, culex)
2. Bed bugs (cimex lectularius Aedes)
3. Blister beetles (Mylabris Pustulata)
4. Fleas (Ctenocephalides felis)

5. Mites (Pyemotes Ventrisus)
6. Honeybees
7. Wasps

- **Mosquito Bite -**

Three patients with mosquito bite are seen. Mosquito is a common insect which cause little reaction on skin. The intensity of mosquito bite is large but it is not harmful to the body therefore the patients does not approach to the doctor. The reaction contains rash, redness of skin, itching.

- **Bedbug Bite -**

Bed bug bite is very common in rural areas. It is also not harmful to the body so patients prefer to home remedy and does not approach to doctor very quickly. Three patients are seen. The reaction causes rows of red swollen lumps.

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- **Beetle Bite -**

Blister beetle is common beetle in Satara which causes dermatitis. The intensity of reaction is high and can cause harm to body. The Beetle bite causes itching, redness of skin, blisters, lesions. If the treatment is not taken properly then there is a possibility of infection. Seven patients are seen.

- **Flea Bite -**

It is common problem in the humans. Two patients were seen. It causes itching, blisters, redness of skin.

- **Honeybee Bite -**

Honeybee can be hazardous for the people. Three patients were seen. Honeybee bite can cause anaphylaxis. It includes itchy rash, redness, swollen body, throat or tongue swelling, shortness of breath, vomiting, low blood pressure.

- **Wasp Bite:**

Two patients were seen. It causes itching, redness, swollen body. Also may lead to anaphylaxis. It is seen that from 20 patients, 7 patients are of beetle bite, 3 of mosquito bite, 3 of bed bug bite, 3 of honeybee bite, 2 of flea bite and 2 of wasp bite.

Table No. 1 Insects bite survey

Bite	Patient		Gender	Age	Occupation
1. Mosquito	3		1.Male	8	Student
			2. Male	11	Student
			3.Female	7	Student
2. Bedbug	3		1. Male	10	Student
			2.Female	27	Housewife
			3. Male	34	Worker
3.Beetle	7		1.Male	42	Gardner
			2.Male	24	Farmer
			3.Male	6	Student
			4.Female	49	Farmer
			5.Male	26	Worker
			6.Female	24	Student
			7.Male	8	Student
4. Flea	2		1.Male	7	Student
			2.Male	28	Farmer
5.Honeybee	3		1.Male	38	Farmer
			2.Female	12	Student
			3. Male	6	Student
6.Wasp	2		1.Female	23	Housewife
			2.Male	8	Student

(From table no. 1),It is seen that these insect species are more harmful for the age group of 0 to 12 i.e. for children. Out of 20 patients, 10 patients are of this group. Children plays outside of the house or on playground most of the times. They play in the grass, bushes etc. so the possibility of insect bite is more in the children.

Out of 20 patients, 6 patients are adult male and 4 are adult female. In study it is seen that the adult people do not get affected by the insect bite easily. Also they prefer to the home remedies.

It is seen that most of the people are working in crop fields. Their occupation is farming so they always comes in contact with the crops, bushes, grass, trees, etc. They do not take proper care while working in farms so the possibility of insect bite is high.

In the total study, 35% patients were of beetle bite, 15% are of mosquito bite, 15% are of bedbug bite, 15% are of honeybee bite, 10% are of flea bite and 10% are of wasp bite.

Conclusion

Collected data is conclude that the insect dermatitis can causes to anyone but the number of insect bite dermatitis is greater in children.

The occupation is also important factor for the study of insect bite dermatitis. Occupation can be a cause of insect bite reaction.

It is also seen that the species which is abundant for causing dermatitis is mosquito and bedbug, but patients do not approach to the doctor for the treatment. They prefer home remedies like applying ice, moisturizer, aloe vera, honey, baking soda, toothpaste, etc.

Proper care should be taken while going outside like wearing full clothes, applying insect repellent cream etc.Use of blanket and mosquito net is also helpful.

References

1. Bed bugs (*Cimexlectularis*) and clinical consequences of their bites. Jerome Goddard, Ph.D.; Richardde Shazo, M.D., JAMA,2009, 301(13):1358-1366.
2. Epidemiological study of insect allergy in children. Effect of accidental sting in allergic children. M.D. Kenneth C. Schuberth at. Al., The journal of pediatrics, 1983;102:361-365.
3. Further experiences with severe allergic reactions to insect stings. Harry Louise Muceller, M.D. N Engl J Med, 1959; 261:374-377.
4. Insect Bite Reaction, Sanjay Singh, Baldeepkumar Mann, IJDVL, 2013;79:151-164
5. Sensitivity to bites by the bedbug, *Cimexlectularis.* K. Reinthadt, D. Kempke, R.A. Naylor, M.T. Siva-Jothy, Medical and veterinary entomolgy (2009)23,163-166.
6. The value of immunotherapy with venom in children with allergy to insect sting. Martin D. Valentine at. Al., N Engl J Med 1990; 323:1601-1603