Journal of Nanoscience and Nanoengineering
Vol. 1, No. 4, 2015, pp. 233-240
http://www.aiscience.org/journal/jnn

Skin Disorders Inflicted Through Insect Invertebrates Along with Diagnosis and Treating of Cases

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Abstract

Skin disorders of humans can result from poor diet, nutritional deficiencies, toxins, bacteria or fungal infections, impurities in the blood, exposure to harsh chemicals, pollution, hard water, soap and detergents, and medications or too much sunshine. This set of recommendations is designed for pest control workers, aims to enhance their awareness of safety and health hazards, and advise them on precautionary measures so as to prevent any accidental poisoning or harm to health. Insects are arthropods of the class Insecta and comprise the most diverse and numerous class of the animal kingdom, and hence human contact with these is unavoidable. Exposure to biting or stinging insects or to their remains can range in severity from benign or barely noticeable to life threatening. Species of insects belonging to the orders of major medical importance are Hemiptera, Diptera, Siphonaptera and Hymenoptera, and the insect orders of minor medical importance are Coleoptera and Lepidoptera. Contacts with insects through their bites or stings can result in adverse reactions in humans that range from mild annoyance to anaphylactic shock and death in extreme cases. Mosquitoes, lice, fleas and bedbugs inject salivary secretions and venoms through specially adapted mouth parts for piercing and sucking blood, whereas bees, wasps and ants inject venoms through specialized structure the stinger, and symptoms of allergic reaction include pain, swelling of the throat, redness, itching or discoloration on skin at the site of bite or sting. All mosquitoes are regarded as annoying biting insects and many species are of public health concern, due to the ability to transfer a number of disease-causing microorganisms. General management measures include cooling the skin, application of calamine and antihistamine to reduce itching, antibiotics for secondary bacterial infection if anyone develops, and any specific treatment for disease transmitted as a result of the bites and stings by insects.

Keywords

Skin Lesion, Sting, Arthropod, Bite, Allergy, Irritation

Received: September 10, 2015 / Accepted: October 1, 2015 / Published online: November 11, 2015

1. Introduction

Some insect arthropods have mouthparts modified to puncture the skin by various mechanisms (siphoning tube or scissor-like blades) leading to skin damage. In this case, damage may be a small punctum, dual puncta (from fangs) and lacerations. Stingers are needle-like structures that may puncture and damage human skin as well. Some skin lesions are due to direct tissue damage from stings or bites of insects. Venom from certain insects may directly affect human skin causing tissue death (necrosis). Insect mouthparts can be generally divided into three broad categories: biting and chewing, sponging and piercing-sucking. Within these categories there are numerous adaptations or specializations among the various insect orders. Biting and chewing mouthpart types, such as those in food pest insects, and sponging mouthpart types found in the filth fly groups, are of little significance regarding human bites, but piercing-

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sucking mouthparts, and especially the bloodsucking types, are of considerable importance. Insect piercing sucking mouthparts vary in the number and arrangement of the stylets, which are needle-like blades, and the shape and position of the lower lip of insect mouthparts, the labium. Often, which is termed the proboscis of an insect with piercing-sucking mouthparts is an ensheathment of the labrum, stylets and labium. These mouthparts are arranged in such a way that they form two tubes. One tube is usually narrow, being a hollow pathway along the hypopharynx, and the other is wider, formed from the relative positions of the mandibles or maxillae. Upon biting, saliva enters the wound via the narrow tube, and blood returns through the wider tube by action of the cibarial or pharyngeal pump. In all stinging wasps, bees, and ants the stinger is a modified ovipositor, or egg-laying device, that may no longer function in egg laying. For the stinging configuration, the ovipositor is modified to enable a stinging function. The genital opening from which the eggs pass is anterior to the sting apparatus, which is flexed up out of the way during egg laying and also the accessory glands have been modified. The venom gland is connected to a venom reservoir or poison sac, which may contain up to 0.1 ml of venom in some of the larger hymenopterans. Direct injury due to skin puncture is characteristics punctum that is with or without edema and erythema, and mosquitoes, fleas, bed bugs and flies biting on sensitized individuals may develop large wheals and surrounding edema (Mullen and Durden, 2002).

Skin lesions resulting from arthropod exposure may arise via various pathologic pathways. There may be direct damage to human skin from mouthparts, fangs, stingers, etc., or indirect damage such as immune reactions to arthropod saliva or venom injected upon biting. Hypersensitivity may develop against venoms (stinging arthropods) or salivary proteins (biting arthropods). Infectious disease agents transmitted by arthropods may also be responsible for skin lesions. Rocky Mountain spotted fever, Lyme disease, and leishmaniasis are few notable examples of arthropod-borne diseases with skin manifestations. Finally, secondary infection may result from arthropod bites or stings (especially as a result of scratching), leading to impetiginous lesions, and this is especially likely if the bite or sting site is scratched extensively. Even in the absence of allergic reactions to venom or saliva, much human morbidity is due to direct effects (injury) of arthropod biting or stinging. Direct injury can occur from mouthparts or stingers piercing human skin (Goddard, 1994). Various cutaneous symptoms, including blistering and contact dermatitis, allergic reaction and secondary infection, are caused by arthropods. Pathogens transmitted by insects or other noxious animals may cause systemic symptoms. Infestation by arthropods or insects may result in cutaneous symptoms, and various pathogens carried by arthropods and other noxious animals can infect humans (Shimizu, 2006; Ring et al., 2104).

2. Skin Disorders Induced By Insects

Following is given the summary of insect orders containing members whose body parts or secretions are known to cause adverse reactions to human's skin (Denenholz and Crissey, 1989; Darmstadt and Lane, 1996).

2.1. Bed Bug *Cimex lectularius*, *C. hemipterus* (Hemiptera: Cimicidae)

Reddish-brown color, wingless, oval or elongated oval crawling insects, usually found in or around beds and furniture. It is an important blood feeding vector of public health concern, due to severe physical, mental, social and economic effects on affected peoples. These pierce the host's skin using their needle-like proboscis and draw out blood. Their bites are not felt and bed bugs rarely awaken a sleeping person, and during feeding the bedbug injects saliva containing an anticoagulant and an aesthetic. Bed bugs can cause a number of health effects, including skin rashes, psychological effects and allergic symptoms. The term for bed bug bites is 'cimicosis', which can manifest in varying levels of severity, from no visible symptoms, small red bumps or welts or prominent spreading blister-like swellings. Bedbug most often bites skin of the thigh, buttock, neck and arms, but may occasionally bite other parts of the body. In the individual not sensitized by previous exposure, there may be no symptoms at any stage and only a purpuric macule indicates the site of the bite. In sensitized person intensely irritating oval or oblong wheals often is as large as 3 cm, or papules surmounted by haemorrhagic puncta are the characteristic reaction. The bites are usually multiple and arranged in rows or clusters and in some cases where the reaction is severe, bullae predominate. Repeated bites tend to generate more severe reactions, and heavy infestations can cause anemia in children and the elderly. Secondary infections can occur due to the scratching of bites (Burnd, 1993).

2.2. Conenose Bug, Kissing Bug (Hemiptera: Reduviidae)

Triatoma and Rhodnius are common genera of these bugs, characterised by large, dark brown or black true bug with different patterns and markings varying with the species, distinct tan or red-and-black margin of abdomen visible beyond the wings, and small conical or elongated pointed head with four segmented antennae. Conenose bugs are

bloodsucking parasites that feed on a wide variety of domestic and wild animals, plus humans. They live outdoors in packrat or other rodent nests, but occasionally fly indoors and are attracted to lights. Once indoors, they actively seek out humans and other, though their bites themselves are mostly painless, intense itching and tenderness may be experienced at the bite site, which can become swollen and reddish to purple. The irritation may last one to two weeks, but sensitive individuals may experience more severe and prolonged reactions. A useful clue that might be helpful to identify the source of bites is that conenose bug bites usually occur in late spring to early summer, and not at other times. They are called 'kissing' bugs because of their habit of biting sleeping victims on the tender skin around the mouth (Krinsky, 2002).

2.3. Flea (Siphonaptera: Pulicidae)

Common fleas include the cat flea *Ctenocephalides felis*, dog flea and *Ctenocephalides canis* (that is why persons in contact with cat and dog are frequently bitten), the Oriental rat flea *Xenopsylla cheopis* and the human flea *Pulex irritans*. Fleas are mostly with shades of brown in color, laterally flattened bodies, and presence of 'combs' or groups of thickened hairs on the front of the head (genal comb) and on the back of the neck (pronotal comb) are often diagnostic of fleas in the genus Ctenocephalides. Other common fleas possess only one of these kinds of combs or none. These have strong hind legs modified for jumping that help them to disperse and find new hosts. Fleas insert their thin, tube-like mouthparts into their host's skin to draw out blood. When a flea bites for its blood meal, saliva (the allergen) is injected into the skin to prevent blood clotting. Flea bites appear as red and inflamed welts on the skin, accompanied by irritation and swelling. The bites usually provoke typical popular uriticaria often with a haemorrhagic punctum in a sensitized individual. Occasionally the reaction is more severe, bullae may occur and the lesions may be grouped in lines or irregular clusters. Lesions in relation to cat and dog fleas bites occur predominantly on the legs below the knees and are most profused around the ankles, but they can also occur on the forearm dependent on unprotected body parts. Due to the bites, patients complain of itching with multiple centrally excoriated papules (Arnold et al., 1990; Wirtz and Azad, 1991).

2.4. Human louse Pediculus Species (Siphunculata: Phthiraptera, Pediculidae)

These are important biting pest of public health concern, due to potential physical, mental, social and economic effects on affected peoples. Two Pediculus species can infest humans such as head louse *P. humanus capitis* and body louse *P. humanus corporis*, while a third kind of louse, the crab louse *Phthirus pubis* (family Phthiridae) can infest pubic hair. These are tiny gray or light brown colored, wingless insects, usually found on the scalp or among hair on the body, flattened body, stout legs with grasping claws at the tips. Most lice are scavengers, feeding on skin and other debris found on the host's body, but some species feed on sebaceous secretions and blood. Head lice feed by injecting small amounts of saliva and drawing out tiny amounts of blood from the scalp every few hours and the saliva may create an itchy irritation. A first case of head lice may not result in itching for four to six weeks and once sensitized, the subsequent infestations cause itching almost immediately. The most common symptoms are itching and sleeplessness, and scratching can lead to secondary bacterial skin infection. Infestations of lice are called pediculosis or lousiness, which is classed as a communicable disease. The head lice cases can result in extreme anxiety and embarrassment in persons harbouring them (Wirtz and Azad, 1991; Mullen and Durden, 2002).

2.5. Mosquito (Diptera: Culicidae)

Worldwide, mosquitoes are one of the most important insect pests that affect the health and well-being of humans and domestic animals. Most notable species include the yellow fever mosquito *Aedes aegypti*, Asian tiger mosquito *Aedes albopictus*, inland floodwater mosquito *Aedes vexans*, malaria mosquito *Anopheles freeborni*, house mosquito *Culex quinquefasciatus*, encephalitis mosquito *C. tarsalis* and dark rice field mosquito *Psorophora columbiae*. Insect has a slender body and legs, females have a needle-like proboscis (piercing and sucking mouthpart), one pair of visible delicate wings and need blood for development of the eggs in the ovaries. In the process of biting, mosquito injects saliva that contains coagulants and haemagglutinins into the dermis, and these acts as a sensitizer. Prominent immediate and delayed reactions occur commonly in the sites of mosquito bites, particularly in children, and more severe local and systemic reactions occur much less commonly. Bites from mosquito usually cause itching, red bumps, itchiness and a central raised dot in the swelling. In addition, mosquito bite is also characterized morphologically by the formation of erythematous papule that is often urticarial in nature. A vesicle at the site or even generalized urticaria may result, but more commonly a pruritic papule forms at the inoculation site. In severe infestations, vesicular papules, vesicles or bullae may occur and this allergic reaction might sometimes last for several weeks and leaves hyper pigmentation. The diagnosis of mosquito bites is based on the history of a disorder, the presence of purities and the morphology of the lesions, and in the differential diagnosis, vasculitis and irritant contact

dermatitis should be considered (Denenholz and Crissey, 1989; Sarwar, 2014 a; 2014 b; 2014 c; 2014 d).

2.6. Bees (Hymenoptera: Apidae, Bombidae)

Bees of two families of special significance are Apidae (the honey bee) and Bombidae (the bumble bee), and these creatures have lapping sucking mouth parts. These insects have venom glands and specialized ovipositor that more or less is well adapted for piercing the skin. When human is stung by a honey bee, the bee is unable to remove the stinger. The stinger and venom apparatus are evulsed from the bee's abdomen in its struggle, but the venom apparatus continues to function and pump in more venom as this bee possesses a barbed stinger. On the contrary, bumble bee possesses an unbarbed stinger and is therefore able to sting repeatedly. Bees insert the posteriorly located stinger into the victim's skin and may give rise to reactions varying from local discomfort to fatal anaphylaxis. Honey bee's venom contains polypeptide mellitin, phospholipase A2, histamine, hyaluronidase and apamin. Honey bee (*Apis mellifera*) sting, therefore, is dangerous essentially for individuals who are at risk. Systemic reactions from the sting may occur through multiple stings. Toxic reactions due to honey bee stings include vomiting, diarrhea, shock and renal failure. What usually occurs is a local reaction, paint at the site of the sting and may be a small amount of swelling and redness that subsides after a few days. On the other hand, peoples who are allergic to bee sting might develop itching, hives or wheals all over their body within minutes. When peoples have severe allergic reactions, they may be have swelling around the eyes, lips, tongue or hand, and may feel like it is difficult to breathe get air and also have a drop in blood pressure, feel faint, and even lose consciousness (Charpin et al., 1994).

2.7. Ants (Hymenoptera: Formicidae)

Ant species in the subfamily Formicinae produce formic acid (methanoic acid), which has the chemical formula HCO_2H, wherein this subfamily of ants uses formic acid, which they eject or spray from an acidopore located at the end of the abdomen, to attack other animals and for self-defense. Formic acid is the simplest carboxylic acid and one of the strongest acids known, with a pH between 2 and 3, which can produce painful injuries to human skin, causing skin burns and eye irritation of field workers. The ant species that produce formic acid are *Anoplolepis gracilipes*, *Paratrechina longicornis*, *Plagiolepis allaudi*, *Nylanderia vaga*, *Nylanderia bourbonica*, *Camponotus variegatus* and *Brachymyrmex obscurior*. The fire ants (*Solenopsis* species) look like ordinary house ants, however, they are aggressive and capable of inflicting a painful sting. The colony of imported fire ants lives in a mound sometimes 3 feet across. The velvet ants Mutillids belong to a large family, Mutillidae, and are wingless, antlike wasps. The females are solitary with an efficient, large stinger. Most species are parasitic on solitary bees and wasp species. Humans are usually stung by velvet ants when the female is accidentally stepped on with bare feet or trapped against the body in clothing or bedding. Since the velvet ant is solitary and roaming, control is difficult (Taber, 2000; Nelson and Taniguchi, 2012).

2.8. Wheel Bug *Arilus cristatus* (Hemiptera: Reduviidae)

The wheel bug is a predaceous bug with slim head and a prominent thoracic, semicircular crest that resembles a cogw heel or chicken's comb. They feed on insects; however, humans are bitten by accidental contact. The bug penetrates the skin with its beak and injects a salivary fluid used to kill its prey. The fluid causes an immediate intense pain that lasts three to six hours. The best way to prevent wheel bug bites is to avoid the insect contact. However, its bite can be more severe than a bee sting, and both nymphs and adults should be avoided or handled with caution (Mead, 2014).

2.9. Blister Beetles (Coleoptera)

The blister beetles are narrow beetles with a neck that is more slender than the head and wings. Adult beetles can release a fluid that causes blisters on human skin. The larvae of blister beetles are harmless to man and are predaceous on other insects. The adult beetles feed on foliage, and persons often come into contact when moving through infested vegetation. Blister beetles use a potent chemical defense to protect themselves and humans may be affected if they encounter these insects. Blister beetles are incapable of delivering an injurious bite, however internally produce a chemical cantharidin that can cause blisters or form welts resulting dermatitis on exposed skin when someone crushes a beetle walking on their skin. The only suitable control of blister beetles is avoidance of individual beetles or chemical application to crop plants. It is necessary to check recommendations for the crop to determine the chemical to be used (Verma and Agarwal, 2006).

2.10. Stinging Caterpillars (Lepidoptera)

Stinging caterpillars do not sting in the familiar manner of bees, yellow jackets, hornets and wasps which are equipped with venom glands and stingers, but among the lepidopterans, neither the adult nor the caterpillar possesses this type of sting apparatus. Instead, stinging caterpillars bear specialized nettling or urticaceous setae or spines. These structures are hollow and contain toxins from poison-gland cells to which they are joined. These are primarily defensive structures for protection of caterpillars from predators and

other enemies. Some of stinging caterpillars frequent are the puss caterpillar, saddleback caterpillar, io moth caterpillar slug caterpillars, stinging rose caterpillar, spiny oak slug and the hag moth caterpillar. The sting inflicted on humans is not from a deliberate attack by the caterpillar, but the result of contact. These caterpillars feed on vegetation and have spines that can break off in the skin. When the spines break, a toxin flows from the spines onto the skin, causing a burning sensation. In some other cases, when brushed against these setae or spines, they break away; releasing toxins to spread on the surface of the skin or broken setae may penetrate the skin. As a preventive measure, when working in an infested area is, always wear protective clothing (Mullen, 2002).

2.11. Wasps, Hornets, Yellow Jackets (Hymenoptera: Vespidae)

Importantly, Hornets, yellow jackets, paper wasps, mud daubers and cicada killers all are wasps. These are generally considered to be beneficial because they attack and destroy many harmful insects found around homes and gardens. Hornets and yellow jackets kill such pests as house flies, blow flies and various caterpillars. Paper wasps are predators of corn earworms, armyworms and many other garden pests. The wasps can usually be identified by their nests and their location, wherein hornets, paper wasps and mud daubers build nests above the ground. Hornets and paper wasps nest in trees, shrubbery and under eaves, while mud daubers nest under eaves, porch roofs, or similar sheltered areas. The yellow jackets usually build their nests in the ground, but sometimes build them above the ground. Underground yellow jacket nests can be very large and may be very well hidden, while cicada killers nest in the ground. If wasps build nests on houses or in bushes where children play or other activities are carried on, nest destruction or chemical control is necessary. Usually, hornets and yellow jackets build football-shaped and paper like nests, while paper wasps build paper like nests that resemble a honeycomb, mud daubers build clay or mud-cell nests, but cicada killers dig holes about ½ inch across and pile the excavated soil around the opening. Hornets, yellow jackets and paper wasps are social insects, and their adult females make up two castes, queens or fertile females that lay eggs, and workers, or sterile females that feed larvae and may lay eggs without mating if the queen dies during the season. Mud daubers are solitary wasps and there is no worker caste, each female constructs a clump of mud cells containing six to 20 cells, after completing the nest, it captures caterpillars or spiders, paralyzes each with its sting, preys are stored in the cell, lays an egg on one of the host, caps the cell with clay, larvae hatch from the eggs, feed on the paralyzed host and complete development takes place in the cell. The cicada killer is also a solitary wasp; its habits are similar to the mud dauber, except it constructs its cells in the soil and provibes the cells with cicadas. Though beneficial, wasps also attack to peoples, when disturbed, hornets, yellow jackets, and paper wasps will sting. Mud daubers and cicada killers usually are not as aggressive and cannot sting unless touched or accidentally caught in clothing. When a wasp stings, it injects a venomous fluid under the skin, the venom causes a painful swelling that may last several days and in some cases, a wasp sting may cause severe illness or even death (Landolt et al., 1999).

2.12. Myiasis (Diptera)

Myiasis is the invasion of the body tissue of man or animals with the larvae (maggots) of certain flies (Diptera) that consume flesh or body fluids for sustenance. Such invasions may be benign or even asymptomatic, or they may result in more destructive disturbances. Myiasis is often described in terms associated with the site of entry, and types of myiasis recognized in humans include urogenital, gastrointestinal, ocular, auricular and cutaneous which is the traumatic invasion of tissue and the most significant form of myiasis. Most instances of myiasis are accidental or opportunistic (facultative) rather than obligate. Although flesh eating dipteran larvae can be successfully used to debride necrotic tissue from wounds under controlled medical conditions, myiasis under operational conditions potentially can damage healthy tissue and produce severe psychological distress in victims. The more common types of myiasis include the enteric (both intestinal and gastric), urinary, nasal, auricular (ear), ophthalmic (eyes) and dermal or cutaneous. When wounds are involved it is referred to as traumatic. Accidental myiasis occurs due to ingestion of maggots by consuming infested food. This can also occur when the maggots invade an anal opening. Semi-obligate myiasis occurs when the maggots invade dead tissue and progress into live tissue that surrounds a wound. Obligate myiasis is when the maggots only infest living tissue. The flies most frequently associated with traumatic myiasis are the flesh flies and blow flies. Blow flies are often found in houses and have a characteristic green, copper or blue metallic coloration. The larvae feed on dead animals, excrement and occasionally living flesh (Hyche, 1998; Durden and Mullen, 2002).

2.13. Urtication (Lepidoptera)

Urtication is an itchy skin eruption characterized by weals with pale interiors and well-defined red margins; usually the result of an allergic response to insect bites. It is a physiological response to contact with toxins of certain invertebrate body parts, such as the setae or hairs of certain moth and butterflies larvae, and severity ranges from mild allergy to severe systemic reactions leading to anaphylactic shock. Urticating hairs have barbs which work their way into

the skin of a human and are therefore an effective defence against predation by mammals. One of the more well-known moth larvae that possess urticating hairs are those of the pine processionary moth (*Thaumetopoea pityocampa*), which is a major pest in pine forests or plantations and the caterpillars form silken nests within the tree. The caterpillars form characteristic processions with each caterpillar following the previous one (head to tail) from a tree to an area where they burrow underground and pupate. Urtication can cause a painful burning and itchy skin eruption or hives, at the point of contact. Although rarely fatal, urtication can be debilitating and may result in systemic shock in some individuals (Long, 1886).

3. Human Bites and Stings Diagnosis

The Physician may begin an evaluation generally with a series of questions that can include how the insect bite happened, when it occurred, what first aid procedures are performed, and any symptoms the patient is experiencing. The Physician may want to know if tetanus shots are up-to-date, so bring any records of immunizations the person may have. A list of the person's medical problems and medications can also help to expedite the medical care. Many patients confuse an insect bite with a sting and may use the terms interchangeably. A bite is usually from mouth parts and occurs when an insect is agitated to defend itself or when an insect seeks to feed. A stinging apparatus is usually a sharp organ of offense or defense, especially when connected with a venom gland, and adapted to inflict a wound by piercing, as the caudal sting of a scorpion. The stinger is typically located at the rear of the stinging insects including bees, wasps and hornets. The cause of a bite can often be readily diagnosed where an insect remains attached, as in ticks and with bloodsuckers that are highly visible e.g., mosquitoes, midges and black flies. Others may not be so easy to diagnose because they bite at night or when the patient is asleep e.g., some mosquitoes, bedbugs, triatomine bugs, or when it is inconspicuous and does not cause an immediately painful bite e.g., some fleas and biting flies. Bites typically result in single or grouped pruritic erythematous papules. Some may have a central punctum and others may be bullous. Bites from mosquitoes, fleas and bed bugs are more likely to cause itching than pain (Mughal et al., 2015; Khalid et al., 2015; Sarwar et al., 2014; 2015; Sarwar et al., 2015).

3.1. Physical Examination

Physical examination of pesticide operator involves looking in and around the wound to see what damage has occurred. With minor bites this is often just a quick look to see if the skin is broken or not, and with deeper bites the doctor may have to anesthetize the area to allow a thorough examination of the affected area. The tests of nerve and tendon function (how well a patient can feel things and move body parts) are usually part of the examination.

3.2. X-rays

In case of most bites, this is not required unless there is a broken bone, but X-rays are often obtained on closed fist injuries and other bites to rule out any foreign bodies and it may also be needed if the Physician believes a piece of any broken biting or stinging organ may be in the wound.

3.3. Blood Tests

Normally, blood tests are not performed in insect bites to human or even infected bites do not usually require a blood test to make the diagnosis. If a patient has to stay in the hospital, chances are likely some blood tests will be ordered. When there is a doubt about the concern of the transmission of HIV or other illness due to a bite, the Physician might order blood tests. Usually, these tests can include an HIV test to determine baseline status as well as tests to determine if the patient mayl be able to tolerate other possible medications.

3.4. Treatment of Patients with Sting

All patients with a history of systemic reaction should be immediately provided with a written emergency management plan, an adrenaline auto-injector and education in its use. Venom immunotherapy can is recommended for all patients with a severe systemic reaction after a sting that is currently available for patients with a history of systemic reaction to a hymenoptera insect sting. All patients should be advised of measures to reduce their risk of future stings. These include wear light-coloured clothing, avoid strong fragrances, perfumes and highly scented shampoos, wear shoes and a hat while outdoors, cover body with clothing, use gloves while gardening, wash hands after eating or handling sticky or sweet foods outdoors (especially children), keep uneaten foods covered especially when eating outdoors, wear full protective clothing while handling bees, and always contact professionals to remove bee or wasp nests. The majority of peoples will have a localized reaction to a sting. Patients should be given antihistamines. Those with large local reactions may need oral prednisolone. Those with infected bites or stings will need oral antbiotics, usually in addition to oral antihistamines (Phyllis, 1995; Mark and Robert, 2002).

4. Insect Control Procedures

Wasps and bees can be easily controlled by applying

insecticides to the nest. However, there is usually a certain amount of risk. Nest and hive should be treated at night to minimize the danger of being stung, or protective clothing should be worn. Whatever spray is used, it should have a quick knockdown agent such as synergized pyrethrum or pyrethroids mixed with it. For below-ground nests, locate the nest and mark the area so it is easy to find after dark. Use a flashlight covered with a red cellophane paper so wasps stay in their nest. At night, puff dusts into the nest entrance, and immediately throw a shovelful of moist soil over the entrance. Be careful not to step into the nest. For aerial nests, spray nests with pressurized containers with a pin-stream spray from a distance of 20 feet. Indoor wasp nests should be controlled as honey bee colonies (Sarwar, 2015 a; 2015 b; 2015 c; 2015 d; 2015 e). Recently many biopesticides agents have been found promising under field and laboratory conditions including the fungal spores, metabolites, proteins, toxins and enzymes that have shown significant efficacies against adults and developmental stages of insect vectors (Sarwar, 2015 f; 2015 g; 2015 h).

5. Conclusion

Physical pain on skin due to bites, piercings and sting is caused by a wide variety of invertebrates that can produce varying amounts of suffering among victims. Symptoms can range from mild annoyance to incapacitation. Although such physical trauma generally is not lethal, it may render a victim incapable of normal activity and can result in psychological disturbance among certain individuals. Allergic reactions occur primarily through contact with venom, saliva, or certain body parts of invertebrates such as setae or hairs. Reactions can be either localized (wheals, swelling) or systemic (anaphylactic shock) and the range of severity, including death in severe cases broad. Victims should provide an essential information on vector invasions to physicians, public health officials and pest control professionals to identify and diagnose insect problems, cover the basics of medical entomology relating to clinical medicine, and practical to carry medical treatments.

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