Causes and effective management of insect bites in the UK

Insects play an important role in maintaining the world’s ecosystem (Zhu and Stiller, 2002) but many of them feed on other animals. Humans are relatively hairless and provide an easy target, especially when partly clothed (Cohn, 2003). Biting insects common to the UK include midges, gnats, mosquitoes, flies, fleas, lice, mites, ticks, and bedbugs (Fig 1).

Although their bites rarely cause serious problems, the salivary gland excretions they deposit contain various antigenic substances that may provoke a reaction in susceptible people (Prodigy, 2003).

**Insect habits and habitats**

**Bedbugs** These are nocturnal blood-sucking parasites that feed at night. During the day they hide in mattresses and bed covers, and in cracks in walls, floors and furniture, where they can survive for more than a year without a suitable food source (Fletcher et al, 2002; Zhu and Stiller, 2002). Bedbug bites do not usually cause reactions.

**Fleas** These live on small rodents, bats, birds and pets, and move from them to feed on humans. Most flea bites are not associated with disease transmission though rat fleas can transmit plague (Zhu and Stiller, 2002).

**Body lice** These live on clothing and move to nearby body areas to feed. Pubic or crab lice live in the pubic or perianal areas – both are blood-feeding parasites.

**Mosquitoes** There are many species of mosquito. The females need a blood meal to produce eggs but males feed on plant nectar. Skin reactions are common at the site of bites and, worldwide, mosquitoes transmit diseases from one bitten host to the next. These include malaria, yellow fever, dengue fever (acute arbovirus infection), lymphatic filariasis (caused by the lymphatic filarial parasites), and encephalitis (Zhu and Stiller, 2002).

West Nile virus is the most likely mosquito-borne disease in the UK. It is uncommon because the population density of mosquitoes is relatively low (Prodigy, 2003). In most people the infection is asymptomatic or causes a mild influenza-like illness. It may cause encephalitis or aseptic meningitis, especially in people aged over 50 (Prodigy, 2003; Crook et al, 2002).

**Midges** Only female midges attack, often in swarms at sunrise or sunset and with a higher frequency in seasons with increased humidity (Cohn, 2003). Midges are rarely vectors of disease.

**Scabies** These mites are found either on animals or in stored goods. They mate on the skin and the female burrows into the epidermis, usually on the hands, wrists or elbows, leaving a small opening and a linear burrow. Scabies causes severe itching, especially at night, not only at the burrowing sites but also over much of the body. Secondary bacterial infection is a complication (Zhu and Stiller, 2002).

**Ticks** These are blood-sucking parasites that may embed in the human skin (Storer et al, 2003). They are found in woodland areas with plentiful wildlife (Cutler, 1997) and are especially prevalent in spring and early summer. Ticks often attach in obscure areas such as behind the ear (Storer et al, 2003) and once attached, may feed for many weeks in preparation for egg-laying (Howell, 2001).

Tick bites often cause local allergic reactions such as eczematous changes, urticaria, blistering, and temporary alopecia (hair loss). Susceptible people may have a delayed hypersensitivity reaction including symptoms of delayed hypersensitivity reaction including symptoms of

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fever, pruritus, and urticaria (Storer et al, 2003). Lyme disease is transmitted by one species of tick (Ixodes ricinus) and, though uncommon in the UK, its incidence is rising – currently there are approximately 200 cases a year (Prodigy, 2003; McGarry et al, 2001). Lyme disease that is caused by a spirochaete can result in arthritis, meningitis, neuropathies, carditis, and encephalopathy.

**Distribution and appearance of bites** Typical distribution of insect bites and their possible causes are listed in Box 1. Reactions to bites are varied. The first time a person is bitten there is usually no reaction unless the saliva contains a substance that is likely to cause direct injury, for example, parasites and bacteria.

After repeated bites, sensitivity occurs (Prodigy, 2003); an itchy papule develops about 24 hours after each bite and lasts for several days.

After further bites, an extremely itchy rash develops immediately and is followed by a firm, pruritic papule. Following continued and repeated exposure, no reaction occurs (Prodigy, 2003).

**Symptoms** Burns (1998) notes that irritation is an almost constant symptom. Rubbing and scratching may increase the inflammatory changes.

Papular urticaria is common in young children and those with a history of atopic dermatitis. It is caused by a sensitivity to the bites and consists of groups or lines of very itchy, indurated papules that persist for up to two weeks (Prodigy, 2003; Stibich et al, 2001).

Bullous reactions (fluid-filled blisters larger than 5mm in diameter) are common in the lower legs and may occur if there are numerous bites or the local reaction is severe (Prodigy, 2003). Anaphylactic reactions to insect bites are uncommon. Typical reactions are listed in Box 2.

Bite reactions can persist for months – for example, tick bites may result in persistent nodules or papules caused by retained mouthparts. However, most tick bites heal within three weeks (Wilson and King, 2003).

**Management of bites** Prodigy (2003) notes that there is a lack of good quality evidence regarding the management of insect bites.

**Midges, gnats, mosquitoes, flies, and ticks** Bites from these are generally ‘one-off’ incidents and treatment of symptoms is usually sufficient. Creams or lotions with soothing qualities are prescribed and may relieve itching.

Antihistamines are of little help in treating pruritus but a short course of sedative oral antihistamine at night may allow sleep and break the itch-scratch cycle (Prodigy, 2003). If local inflammation is present, a topical corticosteroid may help to relieve itching.

For urticarial reactions, a short course of oral antihistamine may be appropriate to help control itching, the appearance of wheals, and sleeplessness (Drug and Therapeutics Bulletin, 2002). People who suffer severe anaphylactic reactions to these insect bites need to carry adrenaline (Stringer et al, 2002).

Ticks must be removed as soon as possible after the bite to minimise complications. The literature has many suggestions as to how tick removal is best performed to achieve the optimum outcome.

The Prodigy guidelines (2003) suggest using fine-point tweezers to grasp the tick as close to the skin as possible and then pulling gently. It is important to avoid squeezing the body of the tick. The site of the bite should be cleaned with disinfectant.

Routine use of antimicrobial prophylaxis or serological tests for Lyme disease following a tick bite is not

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**BOX 2. TYPICAL REACTIONS TO BITES (ADAPTED FROM PRODIGY GUIDELINES, 2003)**

<table>
<thead>
<tr>
<th>BITING INSECT</th>
<th>PRESENTATION</th>
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<tbody>
<tr>
<td>Midge, mosquitoes, gnats</td>
<td>Usually small papules</td>
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<tr>
<td></td>
<td>Wheals (elevated area of cutaneous oedema) and bullae in sensitised individuals</td>
</tr>
<tr>
<td>Fleas — animal/human</td>
<td>Bites may be grouped in lines or irregular clusters</td>
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<tr>
<td></td>
<td>Usually cause popular urticaria in sensitised individuals</td>
</tr>
<tr>
<td></td>
<td>Occasionally bullae</td>
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<tr>
<td>Horseflies</td>
<td>Often very painful with cutaneous wheel which may be accompanied by urticaria,</td>
</tr>
<tr>
<td></td>
<td>dizziness, weakness, wheezing, or angio-oedema. Secondary infection is common</td>
</tr>
<tr>
<td>Bedbugs</td>
<td>Painless bites. May be no reaction if the individual has not been previously bitten.</td>
</tr>
<tr>
<td>The Blandford fly</td>
<td>Bites usually on the legs and are very painful. Various reactions range from small blister</td>
</tr>
<tr>
<td>(found in an arc running from</td>
<td>to large haemorrhagic indurated lesion. May be accompanied by fever or joint pains</td>
</tr>
<tr>
<td>into Dorset</td>
<td>East Anglia through Oxfordshire</td>
</tr>
<tr>
<td>Cheyletiella mites (often</td>
<td>Intensely itchy papules where mites have fed on skin. May be a tiny vesicle surmounting</td>
</tr>
<tr>
<td>harboured by dogs or cats)</td>
<td>the papule. Older lesions may show necrosis</td>
</tr>
<tr>
<td>Mites in stored products such as</td>
<td>Intensely itchy, minute, pruritic papules or papulovesicles (2–3mm red, excoriated,</td>
</tr>
<tr>
<td>crusted grain, flour, and cheese</td>
<td>papules in linear groupings) on exposed parts of the body</td>
</tr>
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**REFERENCES**


