Tick Allergy

ASCIA EDUCATION RESOURCES (AER) PATIENT INFORMATION

Like other arachnids (such as spiders, scorpions and house dust mites), ticks have eight legs. They pass through a number of life stages from egg, to larva, nymph and then finally, the adult. Health problems associated with tick bites include transmission of infectious disease, allergic reactions and occasionally tick paralysis.

Adult ticks cause the majority of health problems

Adult ticks (present mainly on the east coast of Australia from around August to February) cause the majority of the health problems in humans, although all stages of ticks are capable of provoking allergic reactions.

Adult ticks attach themselves to the tips of grass blades and vegetation, and transfer themselves to passing animals or humans. When humans are infested, the tick usually crawls up inside clothing. Adult ticks attach themselves strongly to their host by biting through the skin, and generally lodge in the skin of the head or neck of their host. The most common reaction is local irritation and swelling. Tick saliva can trigger allergic reactions, cause paralysis (due to toxic proteins) and transmit infections.

Tick allergy symptoms range from mild to severe

Minor local itching and swelling is common at the site of a tick bite. Serious allergic reactions (such as anaphylaxis) have also been described, in response to a number of species of ticks, including the so-called Australian paralysis tick, *Ixodes holocyclus*. Almost invariably the allergic reaction occurs when the tick is disturbed, typically after attempts to remove it or, for example, after inadvertently disturbing the tick by scratching. This has implications for what should be done when a tick is discovered (see below).

Diagnosis and management of tick allergy

At this time, there is no reliable skin or blood allergy test to confirm a diagnosis of tick allergy. Australian researchers have identified that the allergens causing problems are proteins in tick saliva. Diagnosis is therefore based on the history of the reaction. Management involves avoidance of ticks where possible, and knowing what to do if bitten again. There is currently no commercially available allergen extract to use for immunotherapy (desensitization) to switch off the allergy.
Ticks as a source of infectious disease

Ticks can transfer infection from animals to human hosts, such as tick typhus. Information on these disorders is beyond the scope of this article, but useful information can be found by contacting:

- TAGS (Tick Alert Group Support Inc., PO Box 95 Mona Vale, NSW 1660 (www.tickalert.org.au/)
- The Tick-Borne Diseases Research Unit, Royal North Shore Hospital, Pacific Highway, St Leonards NSW 2065.

Reducing the risk of tick bites

The following measures may reduce the risk of tick bite:

- Wear long-sleeved shirts and long trousers when walking in areas where ticks occur
- Tuck trouser legs into long socks
- Wear a “coolie” style hat
- Wear light clothes, which makes it easier to see ticks
- Brush clothing before coming inside to remove ticks
- Undress and check for ticks daily, checking carefully in the neck and scalp
- An insect repellent may help, particularly ones containing DEET (such as RID, Tropical RID or Tropical Aerogard or Bushmans)

What to do if you have had potentially dangerous allergic reactions to tick bites in the past

If you are allergic to ticks, you should carry emergency medication (an adrenaline autoinjector such as EpiPen or Anapen) and a means of summoning medical assistance (such as mobile telephone).

What to do when you are allergic to ticks and find one on your body

Disturbing the tick can result in the injection of allergen, and this can trigger an allergic reaction. The following steps are recommended:

- Do not forcibly remove the tick*
- Do not try to kill the tick using insecticide or chemicals (such as oil, turpentine, Kerosene, methylated spirits)*. This is because attempts to remove the tick or using these products can irritate the tick, thus increasing the risk that more allergen containing saliva may be injected. Indeed, most allergic reactions to ticks occur when an attempt is made to remove the tick, or when it is disturbed (such as scratching).
- Seek urgent medical attention in case additional treatment is required. The tick can then be removed under medical supervision where there are the facilities to treat an allergic reaction.
• Use an adrenaline autoinjector (EpiPen or Anapen) if potentially dangerous allergic symptoms occur.

Should one remove ticks or leave them alone?

Whether to kill or remove ticks in patients allergic to ticks commonly causes confusion. In part, this is because most of the literature is concerned with reducing the risk from tick paralysis, rather than preventing allergic reactions. It is commonly recommended that ticks are killed first before removal in order to reduce the risk that they inject more toxin and trigger paralysis. Ticks poisoned with insecticide or spirits, however, do not die immediately, and such chemicals can disturb them enough to cause them to inject more toxin. Other writers concerned with tick paralysis or tick-borne infection recommend that ticks be removed using physical means only (such as by using special forceps http://www.allergy.org.au/www.aafp.org/afp/20020815/643.html).

Additional information and options for treatment of those with tick allergy

The authors of this educational article currently recommend that the tick is killed first using a product called “Aerosta”, and that medical attention be sought immediately after doing so. Aerostart is a spray containing ether that freeze-dries the tick and kills it instantly. This allows the tick to fall out without being able to inject saliva containing allergen. Aerostart can be purchased from hardware stores and some service stations, and is commonly used by mechanics to clear carburettors. Since Aerostart is a highly flammable product, it is wise to use it away from naked flames and to not smoke around the area of use. (Rapid cooling of the surrounding skin may also occur and thus skin irritation). (More information on Aerostart can be obtained at crcind.com.au/catalogue.nsf/web_brands/Aerostart?openDocument)

It is important to note that:

• this advice is based on clinical experience of those treating patients with tick allergy
• this product is not “registered” for such use
• this product is highly flammable, and thus should not be used near naked flame or when smoking
• rapid cooling of the skin and thus skin irritation may occur
• since it is unlikely that formal studies in this area will occur in the near future, such advice is based on a consensus of “expert opinion” rather than derived from results of formal clinical studies.

Tick Bites and Red Meat Allergy

Australian allergic diseases physicians have recently described an association between tick bites and the development of red meat allergy (references 8, 10-12), which sparked interest from US researchers (reference 9). They have subsequently identified the part of the red meat allergen giving rise to the allergic reactions, galactose alpha-1,3-galactose. These allergic reactions to red meat typically occur in individuals who have had local allergic reactions to ticks. Within six months or so they develop anaphylaxis to red meat which almost invariably occurs several hours after the eating of the red meat. Rarely, these red meat allergic reactions, as with anaphylaxis in general, may be profound due to the co-existence of an increased number of mast cells (mastocytosis).
Additional Web links

NSW Department of Health 2004 article

Tick Alerts Support Group (TAGS, Australia)

Australian Venom Research Unit, Department of Pharmacology, University of Melbourne


University of Sydney Department of Medical Entomology
medent.usyd.edu.au/photos/tick_photos.htm
medent.usyd.edu.au/fact/ticks.htm

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References

12. van Nunen SA, Zaininger A, Clarke LR and Fernando SL. Systemic Mastocytosis and Severe Anaphylaxis provoked by an IgE-Mediated Reaction to a Food. 2009 XXVIII Congress EAACI abstract #1554b.

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