Summer eczema (SE), also known as equine insect bite hypersensitivity (IBH) or sweet itch, is a recurrent seasonal pruritic dermatitis of the horse caused by hypersensitivity reactions to bites of insects. Typically the mane and tail area and sometimes also the linea alba are affected. In severe cases, the head, the ears and the prepuce or udder are affected as well. The lesions are documented as crusting, alopecia and excoriations or in chronic cases rugae or folds. The major clinical lesions are caused by self-trauma (pruritus) although the insect can induce primary lesions consisting of small papules or wheals. Biopsies of these damaged skin areas reveal a perivascular eosinophilic and lymphocytic dermatitis. Sometimes there is also an eosinophilic vasculitis and in chronic cases fibrosis (Stannard 2000).

Various studies indicate that in most cases SE is an IgE-mediated reaction against bites of Culicoides spp. (midges) and sometimes Simulium spp. (black flies) or other insects:

- In horses with SE, positive skin reactions are often seen 30 min after intradermal tests with extracts from Culicoides spp. However, some horses also exhibit positive skin reactions after 4 hours and in some studies even 48 hours after intradermal injections (Quinn et al. 1983; Hallldorsdottir et al. 1989; Anderson et al. 1993).
- Biopsies taken after intradermal injection of Culicoides extracts showed an increase in eosinophils (Foster et al. 1995) and a mononuclear cell infiltrate in SE-affected but not in control horses.
- The dermis of lesional SE biopsies contains significantly more IgE positive cells and mast cells than the dermis of healthy horses (van der Haegen et al. 2001).
- Immunohistology on sections of fixed Culicoides demonstrated the presence of antibodies in horse sera which recognised Culicoides salivary glands. IgE antibodies could be detected in sera from horses with clinical signs of SE, but not in sera from healthy controls or in sera from horses with a history of SE and in remission at the time of sampling (Wilson et al. 2001).
- In vitro histamine or sulfidoleukotriene (sLT) release after incubation of peripheral blood leukocytes with Culicoides or Simulium whole body extracts also suggest that IgE-mediated reactions play an important role in the pathogenesis of SE (Kaul 1998; Marti et al. 1999). A recent study has demonstrated that in vitro sLT release with Culicoides extract is a useful tool for the diagnosis of SE: This test has a high specificity (97%) and good sensitivity (80%) for diagnosis of SE (Baselgia et al. 2003).

These studies indicate that IgE-mediated reactions are often involved in the pathogenesis of SE. Furthermore, an ongoing study using flow cytometry suggests that T cells from SE horses have a bias towards interleukin-4 synthesis as opposed to interferon-γ synthesis, i.e. a Th2-type biased immune response (Hamza et al. 2004).

At present, treatment of SE is mainly based on avoidance of the insects (stabling, summer eczema blankets, various lotions and repellents, e.g. permethrin) and on the use of corticosteroids. In two studies hyposensitisations were carried out with Culicoides whole body extracts: while Anderson et al. (1996) could demonstrate an improvement of the clinical signs in treated horses, a placebo controlled study showed no difference between horses treated with placebo and those treated with Culicoides whole body extract (Barbet et al. 1990). Furthermore, most horses included in the study from Anderson et al. (1996) developed large, painful swellings at the injection site (Anderson, personal communication). Hyposensitisations will probably only be successful with the use of pure, standardised allergens (Valenta et al. 1999). Recombinant technologies will lead to identification and production of the allergens causing SE as pure proteins. Expression libraries from salivary glands of C. nubeculosus and S. vittatum have been constructed. Screening of these libraries and expression of pure recombinant allergens should contribute to the opening of new perspectives for efficient diagnosis and treatment of SE.
References


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