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Comparison of the Immune Response against Culicoides and Simulium Extracts in Horses Living in Iceland and in Horses from Switzerland (28-Jun-2004)

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Summer eczema (SE) does not occur in horses born and living in Iceland because Culicoides spp. are not present there (Illies 1978) and thus, horses in Iceland are not sensitised against Culicoides spp. as demonstrated in a survey performed with intradermal testing with Culicoides extracts (Larsen et al. 1988). However, 50% of the Icelandic horses which are imported from Iceland to the continent (where Culicoides spp. are present) suffer from SE if more than 2 years have passed since import (Marti et al. 2003). Interestingly, biting Simulids are found in Iceland (Peterson 1977) and in a previous study we could demonstrate that these insects contain allergens to which SE-affected horses are sensitised: SE-affected horses from Switzerland have significantly more often a positive test result with an in vitro sulfidoleukotriene (sLT) release test with Icelandic Simulium vittatum extract than healthy control horses (Baselgia et al. 2003).

An understanding of the immunopathogenesis of SE in imported Icelandic horses is a prerequisite for the development of new treatments and prevention of SE in imported Icelandic horses.

Preliminary results from ongoing studies will be presented. The aim of these studies is:

1. To investigate whether horses living in Iceland are really not sensitised against Simulids (exposure to low), or if some of them are sensitised but show no clinical signs of SE because the time of exposure to the insects is too short.
2. To assess if after import to Switzerland, Icelandic horses developing SE produce an immune response against Culicoides/Simulium allergens that is different from the immune response in imported Icelandic horses who are also exposed to bites of Culicoides/Simulium but who do not develop the disease. For that purpose sequential studies are being performed in horses imported from Iceland just after their import in Switzerland and then at regular intervals (1x per year).

The immune response is monitored with an in vitro sLT release test with Culicoides and Simulium extracts. Serum IgE levels against these insect extracts has been determined in a subgroup of these horses and in a pilot study interleukin-4 and interferon-γ producing T-lymphocytes have been determined by intracellular staining, using flow cytometry.

In the first study, the in vitro sLT release assay has been performed in 170 horses living in Iceland and in 108 SE-affected and 140 healthy Icelandic horses living in Switzerland.

The second study (sequential study) presently includes 131 horses, imported between 2001 and 2003 from Iceland to Switzerland. Onset of disease is being monitored. Nine from 31 horses (=30%) imported from Iceland in 2001 are already suffering from SE and three additional horses are probably suffering from SE; diagnosis will be confirmed in summer 2004. Seven from 58 horses (12%) imported from Iceland in 2002 were affected with SE in autumn 2003 and in six additional horses imported in 2002 it was not clear whether they had first clinical signs of SE. All 42 horses imported from Iceland in 2003 had no clinical signs of SE in autumn 2003.

Preliminary results of the in vitro release assay, of serological tests and of cytokine determination will be presented.
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References


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