Evaluation of a serodiagnostic technique for detecting mouse mite infestation

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Mouse mites of three genera, *Myobia, Myocoptes* and *Radfordia* continue to plague facilities housing laboratory mice, even in the face of stringent biosecurity measures. Unfortunately these mites often propagate and spread prior to their detection, predominantly due to the difficulty in their detection. Current methodologies for detection, while 100% specific, have a low sensitivity, are time consuming and tedious. Creation of a sensitive serodiagnostic technique would facilitate detection and ease workload. We evaluated whether increases in total IgE could serve as a marker to detect mite infestations. Two groups of outbred female Swiss Webster (SW) mice (n=8 to 12) were introduced on day 0 to either a mixed infestation of *Myocoptes* and *Myobia* or *Myocoptes* alone. Controls included uninfected age matched female SW mice (n=8) and female SW mice used as health monitoring sentinels (n=45). Sentinels had been in the facility between two to twelve months and were mite free on skin scrapes. Blood, collected by submandibular venous puncture, was analyzed by a mouse specific IgE ELISA at four time points, days 0, 15, 30 and 45 for all animals except sentinels who were bled once at varying ages. By day 15, IgE levels in the *Myocoptes*/*Myobia* group increased significantly compared to day 0 of this group ($P=0.004$) and to day 15 of the control group ($P<0.0001$). By day 30, the IgE levels for the *Myocoptes* group increased significantly compared to day 0 of this group ($P=0.02$) and to day 30 of the control group ($P=0.0006$). Increases were frequently seen before adult mites were detected by skin scrape. There was no significant increase in IgE levels between sentinel and uninfested control mice. Although IgE is a non-specific indicator of disease, our data suggest that an increase in IgE levels warrants investigation, especially as mite infestations can rapidly elevate IgE levels. We propose including IgE levels in a standard mouse serologic panel will enhance biosecurity.