The impact of murine cytomegalovirus (MCMV) on enclosure populations of house mice (*Mus domesticus*)

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Abstract

Feral house mice are a significant agricultural pest in south-eastern Australia. Fertility control is favoured as a long-term control strategy, using murine cytomegalovirus (MCMV) as a viral delivery system for an immunocontraceptive. We examined the impact of one and two non-sterilising field strains of MCMV on populations of house mice housed under semi-natural conditions. MCMV had no effect on the proportion of females pregnant or lactating or on the number of placental scars per female. However, females in enclosures with two strains of MCMV produced fewer litters. No impact of MCMV was detected on adult survival, with high survival (>95%) detected in all enclosures. Similar numbers of the first cohort of young entered the trappable population of all enclosures. There was no significant impact of MCMV on survival of young mice, although there was a trend for reduced numbers of the second cohort of young and less successful recruitment in enclosures with two strains of MCMV. The two cohorts of young mice in enclosures with MCMV had poorer body condition. These impacts of infection on young mice imply that MCMV may have negative effects on survival only when the host immune system is not fully developed or the host is immunocompromised. Overall, there was no effect of MCMV on the rate of increase of the mouse populations. Therefore, the effects of MCMV were minor at a demographic level, confirming the suitability of an Australian field strain of MCMV as a vector for an immunocontraceptive of mice.

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