

A Systematic Review and Meta-analysis on the Global Molecular Epidemiology of Microsporidia Infection Among Rodents: A Serious Threat to Public Health

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Abstract:

Microsporidiosis as a zoonotic disease has caused serious health problems in high-risk groups, including immunosuppressed individuals. Among the potential animal reservoirs of microsporidia, rodents play a key role due to close-contact with humans and their dispersion in different environments. Therefore, this systematic review and meta-analysis aimed to assess the global status and genetic diversity of microsporidia infection in different rodents.

Methods: The standard protocol of preferred reporting items for systematic reviews and meta-analyses (PRISMA) guidelines were followed. Scopus, PubMed, Web of Science, and Google Scholar were searched from 1 January 2000 to 15 April 2021. All peer-reviewed original research articles describing the molecular prevalence of microsporidia infection in rodents were included. Inclusion and exclusion criteria were applied. The point estimates and 95% confidence intervals were calculated using a random-effects model. The variance between studies (heterogeneity) were quantified by I² index.

Results: Of 1695 retrieved studies, 22 articles (including 34 datasets) were included for final meta-analysis. The pooled global molecular prevalence (95% CI) of microsporidia infection in rodents was 14.2% (95% CI 10.9–18.3%). The highest prevalence of microsporidia was found in *Apodemus* spp. 27.3% (95% CI 15–44.5%). *Enterocytozoon bieneusi* was the most common pathogen (26/34; 76.47% studies) according to PCR-based methods, and the genotype D as the highest reported genotype (15 studies).

Conclusions: The findings of the study showed a relatively high prevalence of microsporidia infection in rodents as a potential animal reservoir for infecting human. Given the relatively high incidence of microsporidiosis, designing strategies for control, and prevention of microsporidia infection in rodents should be recommended.

Keywords: *Enterocytozoon bieneusi*; Meta-analysis; Microsporidia; Molecular prevalence; Rodents.