Global prevalence and subtype distribution of Blastocystis sp. in rodents, birds, and water supplies: A systematic review and meta-analysis

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Abstract

Animals such as rodents and birds may play a key role in the distribution of Blastocystis sp., either as introducers of the parasite into the water or as receptors of an infection already established in the water. Hence, we aimed to evaluate the prevalence and subtype distributions of Blastocystis sp. in rodents, birds, and water supplies at a global scale through a systematic review and meta-analysis approach. The standard protocol of preferred reporting items for systematic reviews and meta-analyses (PRISMA) statements were applied. Eligible prevalence studies on Blastocystis sp. in rodents, birds, and water supplies, published between 1 January 2000 and 20 January 2022 were collected using a systematic literature search in online databases (Scopus and Web of Science) and search engines (PubMed and Google Scholar). Inclusion and exclusion criteria were followed. The point estimates and 95% confidence intervals (CI) were calculated using a random-effects model. The variances between studies (heterogeneity) were computed by I2 index. In total, 20 articles (24 datasets) for birds, 18 articles (18 datasets) for rodents, and 10 articles (12 datasets) for water supply were included for the final meta-analysis. The pooled prevalence of Blastocystis sp. in birds, rodents, and water was estimated to be 29% (95% CI 12-47%), 18% (95% CI 12-23%), and 10% (95% CI 6%-15%), respectively. Considering the subtypes, Blastocystis sp. with subtypes ST7 in birds, ST4 in rodents, and ST1 in water supplies were the highest reported subtypes. The present results highlight the role of birds, rodents, and water as a reservoir for human-infected Blastocystis sp. Therefore, this global estimate could be beneficial for preventive and control measures.

Keywords: Birds; Blastocystis sp.; Meta-analysis; Rodents; Water.