

Subtype distribution of *Blastocystis* sp. isolated from humans in Iran: a systematic review and meta-analysis

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ABSTRACT

Aim: This systematic review and meta-analysis evaluated the subtyped *Blastocystis* sp. isolated from humans in Iran.

Background: *Blastocystis* sp. is an anaerobic intestinal protozoan that infects humans as well as domestic and wild animals, i.e. mammals, amphibians, reptiles, and arthropods.

Methods: A comprehensive search for papers published before April 2022 was undertaken utilizing English and Persian databases. The following MeSH keywords were used in the electronic search: (*Blastocystis* sp.) AND (molecular OR subtype) AND (prevalence OR epidemiology) AND Iran. The quality of the included studies was evaluated. Thereafter, a random-effects meta-analysis was conducted to estimate the pooled prevalence and odds ratios regarding the included studies.

Results: A total of 32 studies comprised of five case-control studies and 27 cross-sectional studies met the eligibility criteria. The overall pooled prevalence of subtyped *Blastocystis* sp. in Iran was estimated to be 10% (95% confidence interval: 6 to 15%). Eight subtypes of *Blastocystis* sp. (ST1- ST7 and ST9) were identified in our study, of which ST3 was the most common subtype (0.04; 0.02-0.07). The difference in subtypes between two case and control groups in reported studies was not significant, but the odds ratio of infection by ST3 (0.98; 95% CI, 0.30 to 3.20) was higher in cases.

Conclusion: The current systematic review showed that with the exception of ST8 and ST12, all human *Blastocystis* sp. subtypes reported in the world are found in different parts of Iran.

Keywords: *Blastocystis*, Subtype, Meta-analysis, Iran.

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Introduction

Blastocystis sp. is an anaerobic intestinal protozoan that infects humans as well as domestic and wild animals, such as mammals, amphibians, reptiles, and

arthropods. People become infected via the fecal-oral route through direct or indirect ingestion of infectious cysts (1, 2).

Based on molecular epidemiological data, the prevalence of this parasite is still unknown in many parts of the world. Geographic variations in some parts of the world affect the prevalence of subtypes; moreover, some reports have pointed to associations between specific subtypes and disease (3). Based on the findings of a systematic review and meta-analysis study by Javanmard et al., low levels of socioeconomic status

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