

# Cryptosporidiosis in HIV/AIDS patients in Belgrade, Serbia: a single center study

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**Introduction:** *Cryptosporidium* species can cause chronic diarrhoea in people living with HIV (PLWH) and be associated with advanced immune deficiency. The prevalence of cryptosporidiosis among PLWH is decreasing in the era of antiretroviral treatment (ART), with estimated global prevalence of 11.2%\*.

**Objective:** Determining the prevalence and risk factors for cryptosporidiosis among PLWH in Belgrade, Serbia.

**Methodology:** Our cross-sectional study included all cases of cryptosporidiosis among PLWH in our center between January 2011 and April 2024 (Figure 1).

**Diagnostics:** Cryptosporidiosis was diagnosed by microscopically identifying cryptosporidial oocysts in faecal smears stained with a modified Ziehl-Neelsen stain. Depending on availability, stool samples were also tested with a rapid diagnostic test (RDT) for the qualitative detection of *Cryptosporidium*-specific antigens (RIDA®QUICK or CerTest). Molecular detection of *Cryptosporidium* genus-specific nucleic acid using rapid multiplexed nested RT-PCR via the BioFire® Gastrointestinal Panel was additionally recently introduced.

**Results:** Multiple faecal samples from 511 PLWH with a compatible clinical syndrome were microscopically examined: Cryptosporidial oocysts were found in 18 cases (3.5%); The RDT test was performed in 11 cases, 4 of which were negative. Multiplex PCR was used in 4 cases, and the results were consistent with microscopy.

Demographic, epidemiological and clinical characteristics of patients with cryptosporidiosis are presented in Table 1.

**Outcome:** Two patients with newly discovered HIV infections died from a septic condition, while the others fully recovered after receiving symptomatic treatment and initiating ART.

**Conclusion:** To our knowledge, this is the first study to estimate the prevalence of cryptosporidiosis among Serbian PLWH. Our results show a relatively high prevalence of cryptosporidiosis, given the high proportion of late presenters among newly diagnosed PLWH (50-60%).

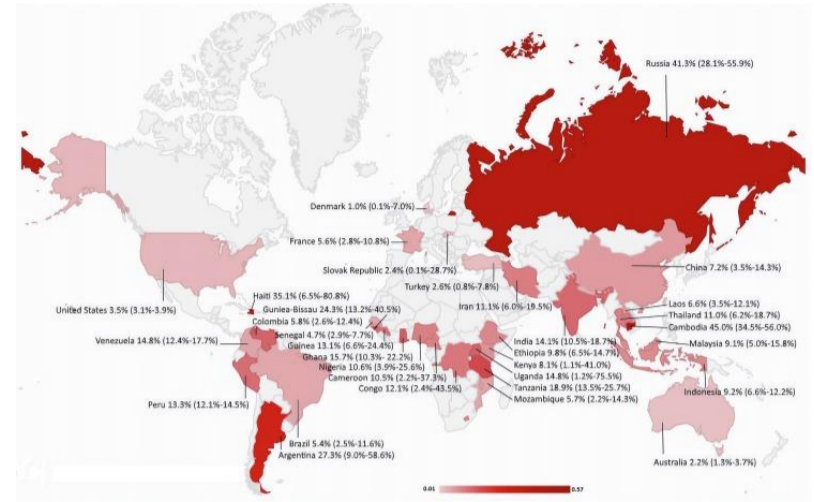


Figure 1

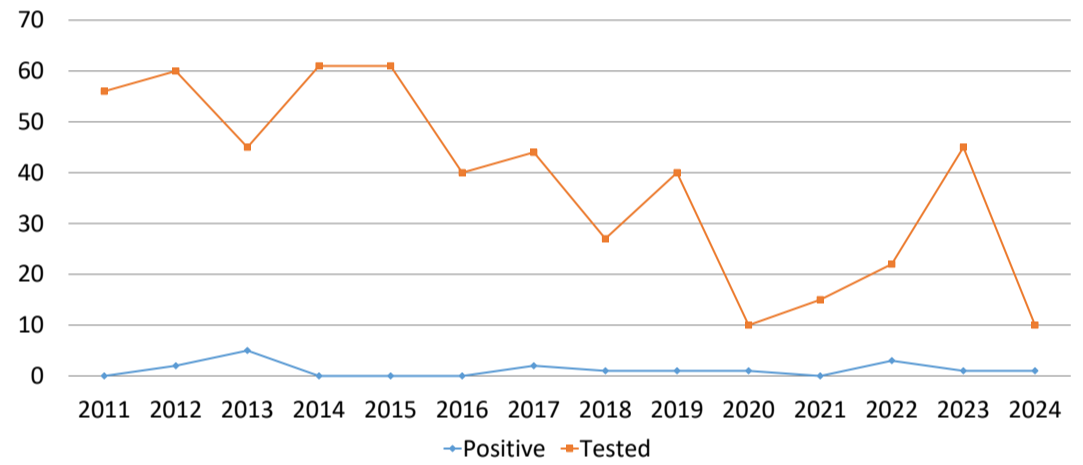


Table 1. Demographic, epidemiological and clinical characteristics of patients with cryptosporidiosis (n = 18)				
	All	Newly diagnosed HIV	Known HIV diagnose	p-value
Patients, n	18	9	9	
Median age, years (range)	43 (26-76)	40 (30-55)	45 (26-76)	0.387
Males, n (%)	14 (77.8%)	8 (88.8%)	6 (66.6%)	0.257
Risk factor for HIV infection, n (%)				
Intravenous drug use	1 (5.5%)	∅	1 (11.2%)	
Unsafe homosexual intercourse	5 (27.8%)	2 (22.2%)	3 (33.3%)	
Unsafe heterosexual intercourse	1 (5.5%)	∅	1 (11.2%)	
Unknown	11 (61.2%)	7 (77.8%)	4 (44.4%)	
Median of HIV positivity (months, range)	53 (0-216)	∅	106 (2-216)	
Patients with CDC-C class, n (%)	15 (83.3%)	9 (100%)	6 (66.7%)	0.058
Mean CD4+ T-cell count nadir cells/ml ± SD	170±239	67±62	272±307	0.083
Not under ART during cryptosporidiosis	14 (77.8%)	9 (100%)	5 (55.5%)	0.023
Median period of symptoms for cryptosporidiosis (months, range)	3.4 (0.1-12)	4.4 (1-12)	2.4 (0.1-12)	0.039
Clinical characteristics, n (%)				
Diarrhoea	17 (94.4%)	8 (88.9%)	9 (100%)	0.303
Vomiting	3 (16.7%)	2 (22.3%)	1 (11.2%)	0.527
Abdominal pain	5 (27.8%)	3 (33.4%)	2 (22.3%)	0.599
Fever	8 (44.4%)	4 (44.5%)	4 (44.5%)	1.0
Weight loss	15 (83.3%)	8 (88.9%)	7 (77.8%)	0.527

Reference: \*Ahmadpour, E., Safarpour, H., Xiao, L., Zarean, M., Hatam-Nahavandi, K., Barac, A., Picot, S., Rahimi, M. T., Rubino, S., Mahami-Oskouei, M., Spotin, A., Nami, S., & Baghi, H. B. (2020). Cryptosporidiosis in HIV-positive patients and related risk factors: A systematic review and meta-analysis. *Parasite (Paris, France)*, 27, 27. <https://doi.org/10.1051/parasite/2020025>