Cryptosporidiosis is a water- and food-borne enteric disease caused by a protozoan parasite belonging to the genus *Cryptosporidium*. The severity of the clinical signs depends on the age and immunity of the infected person. The Department of Health and National Notifiable Diseases Surveillance System (NNDSS) of the Australian Government reported a rise in the prevalence of cryptosporidiosis in Australia. In the past 12 months (13 May 2023-12 May 2024), 12,933 cases of cryptosporidiosis have been reported to the NNDSS, which is 5.7 times higher than the historical five-year mean (n=2,281).

During three months (13 February-12 May 2024), 8,144 cases of cryptosporidiosis were reported to the NNDSS, which is 10.8 times higher than the historical five-year mean for this period (n=754).

More than 40 morphologically and molecular-biologically different *Cryptosporidium* species infect mammals, amphibians, birds, and reptiles. However, *C. hominis* and *C. parvum* are the two main species that cause infections in humans and animals. The disease can be transmitted *via* the respiratory route, but, the most important way of transmission for these parasites is the fecal-oral route. The thick-walled oocysts are invasive forms for all hosts, including humans, and domestic and wild animals. They can be found in water supplies, fruits, and vegetables, or soil contaminated with feces. The oocysts can survive outside the host for several months and retain infectivity, despite adverse environmental conditions such as salinity and the presence of chemicals.



After the thick-walled oocyst ingestion with food or water, numerous signaling molecules expressed on the sporozoite surface mediate their attachment and invasion of the host cells. After the attachment and invasion of *Cryptosporidium*, the host-parasite interactions play an important role in the pathogenesis. Histologically, *lamina propria* is infiltrated by neutrophil granulocytes and large mononuclear cells. A degeneration of epithelial cells, metaplasia of villus epithelial cells, hyperplastic crypt epithelium, and microvilli displacement in the area

of the parasite attachment zone were also seen. These pathological alterations result in the reduction of the intestinal absorption surface, which leads to malabsorption. As a result, osmotically active particles remain in the intestinal lumen, osmotic diarrhea develops, and water resorption is impeded.

In an immunocompetent host, the incubation period is between 5 and 21 days, and acute self-limiting gastroenteritis is characterized by medium to profuse watery to catarrhal diarrhea, abdominal pain, nausea, vomiting, flatulence, fatigue, and anorexia for 3 to 12 days. The infection can persist with chronic diarrhea for more than 4–6 weeks. Respiratory symptoms such as cough, sneezing, and expectoration can occur after inhalation of oocysts from contaminated air. Asymptomatic infection can occur as well. Children under five years old are the most affected group in developing countries, especially neonates, who are highly susceptible to infection due to their immature immune systems. It is noteworthy that *Cryptosporidium* infection at a young age has been associated with stunted growth and long-term cognitive problems, especially in children from developing countries.

In immunocompromised individuals suffering from various types of immunodeficiency, particularly those with a significant reduction in the number of CD4+ lymphocytes such as individuals with human immunodeficiency virus (HIV)/ acquired immunodeficiency syndrome (AIDS), or those undergoing immunosuppressive therapy following organ transplantation, the infection can develop into a chronic and potentially fatal diarrheal disease. In HIV/AIDS patients, *Cryptosporidium* is one of the major causes of diarrhea, and it may cause fatal complications. *Cryptosporidium* has been isolated from the gallbladder and respiratory tract of HIV/AIDS patients. Several mechanisms have been proposed to explain the susceptibility of AIDS patients to cryptosporidiosis. CD4+ cells play an important role in the immune response to gastrointestinal pathogens. Low CD4+ cell counts are associated with an increased risk of enteric parasite infection and chronic diarrhea. Currently, there is no effective treatment of cryptosporidiosis. (Helmy YA, Hafez HM. Cryptosporidiosis: From Prevention to Treatment, a Narrative Review. *Microorganisms* 2022, *10*(12), 2456) https://doi.org/10.3390/microorganisms10122456

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