Coccidian enteric parasites

Cryptosporidium
Cyclospora

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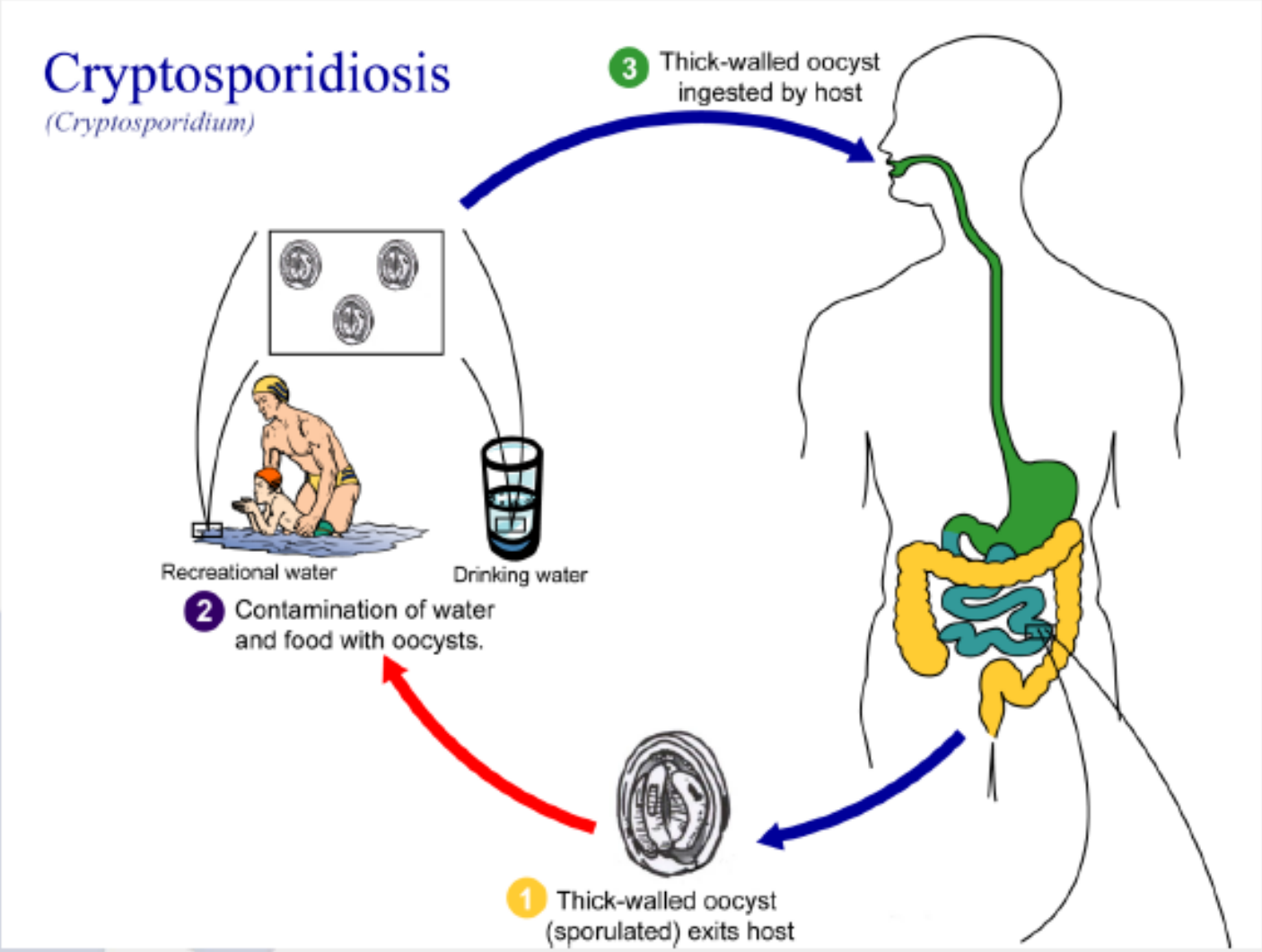
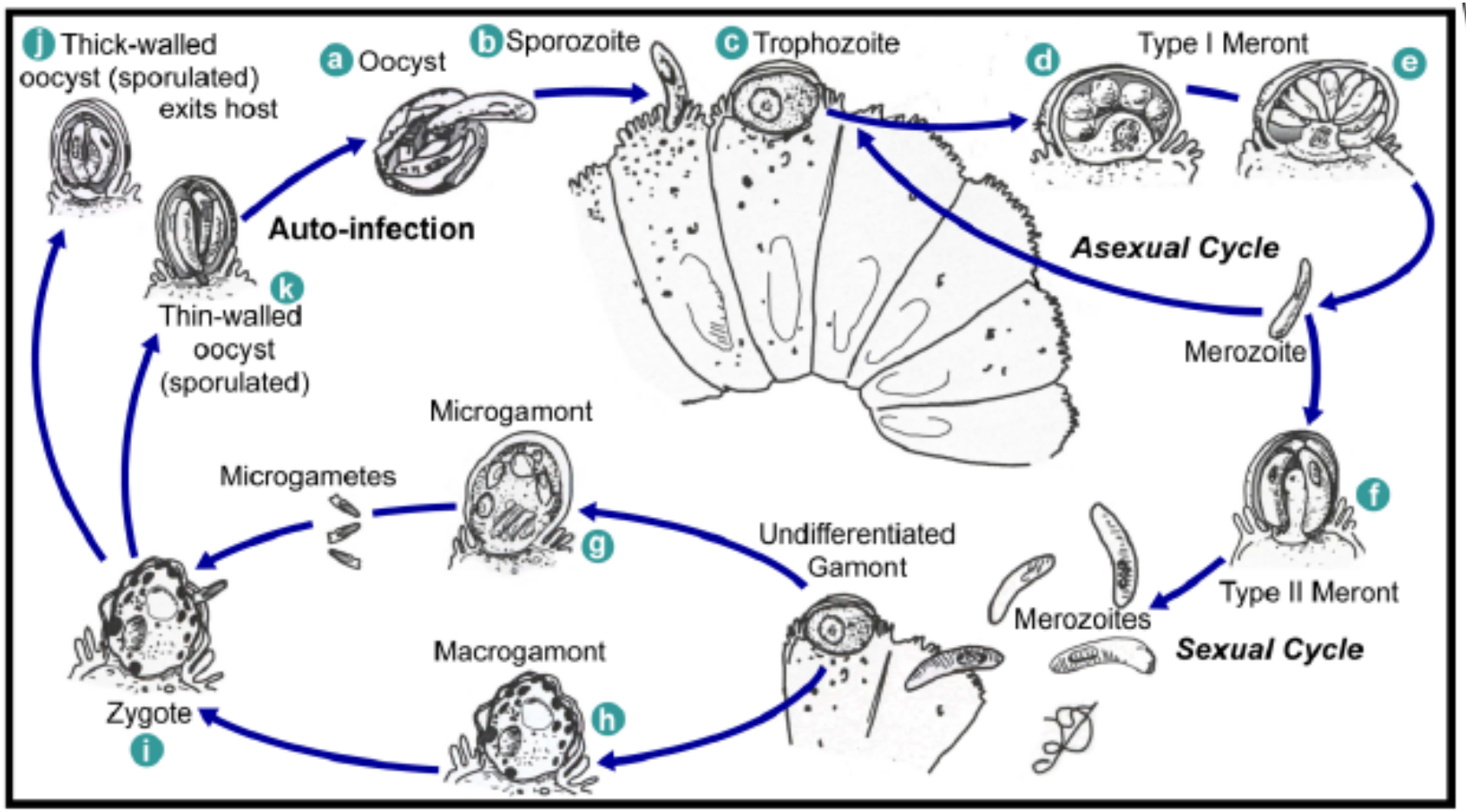
Pathogen - *Cryptosporidium*

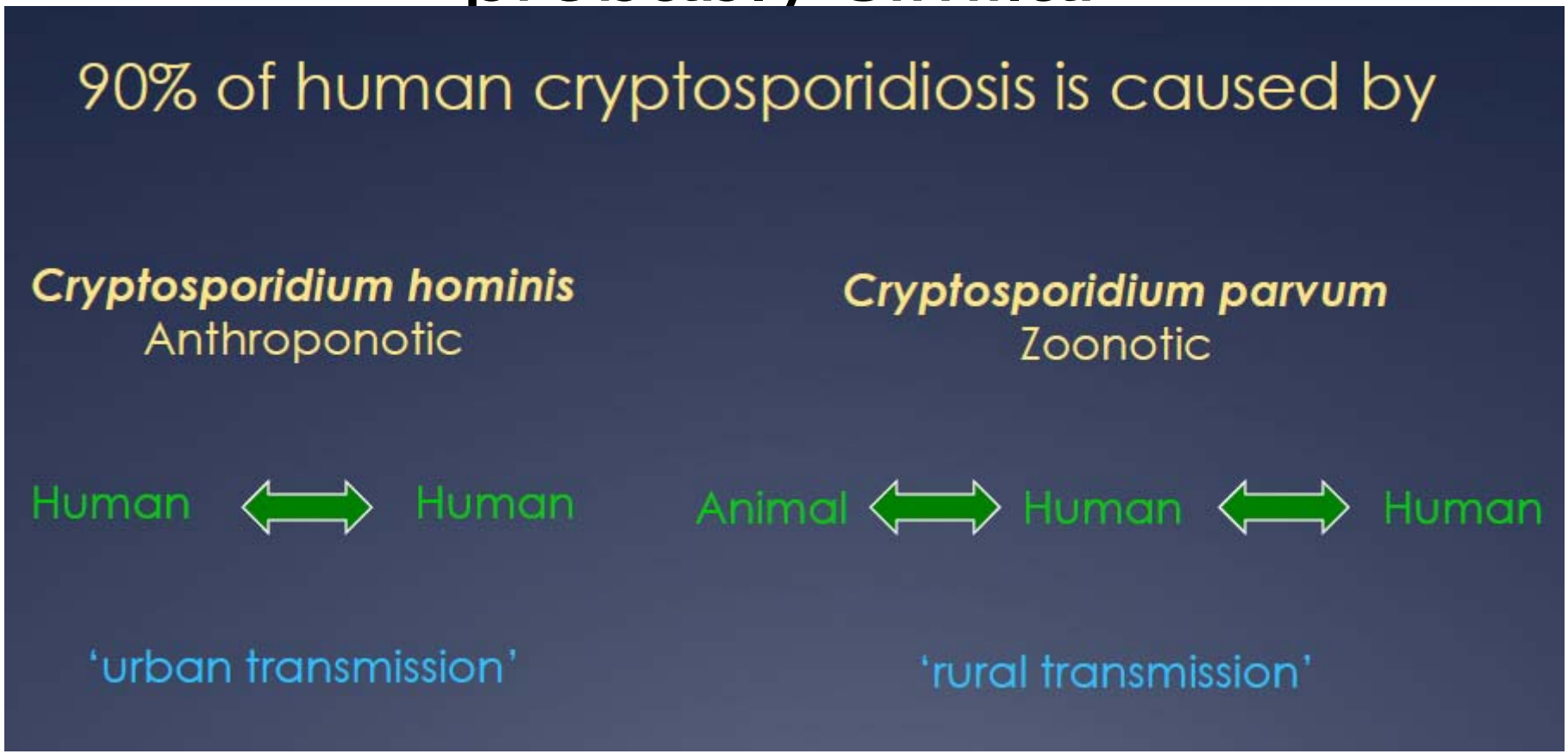
- Protozoan Parasite
- 21 Species
- Human Species
  - *C. Parvum*
  - *C. Hominus*

Life cycle


Cryptosporidiosis
(Cryptosporidium)
3 Thick-walled oocyst ingested by host
Recreational water
Drinking water
2 Contamination of water and food with oocysts.
1 Thick-walled oocyst (sporulated) exits host


j Thick-walled oocyst (sporulated) exits host
a Oocyst
b Sporozoite
c Trophozoite
d
Type I Meront
e
Auto-infection
k
Thin-walled oocyst (sporulated)
Asexual Cycle
Merozoite
Microgamont
Microgametes
g
Undifferentiated Gamont
f
Type II Meront
Merozoites
Sexual Cycle
Macrogamont
h
Zygote
i

Australian perspective: Nepal probably similar

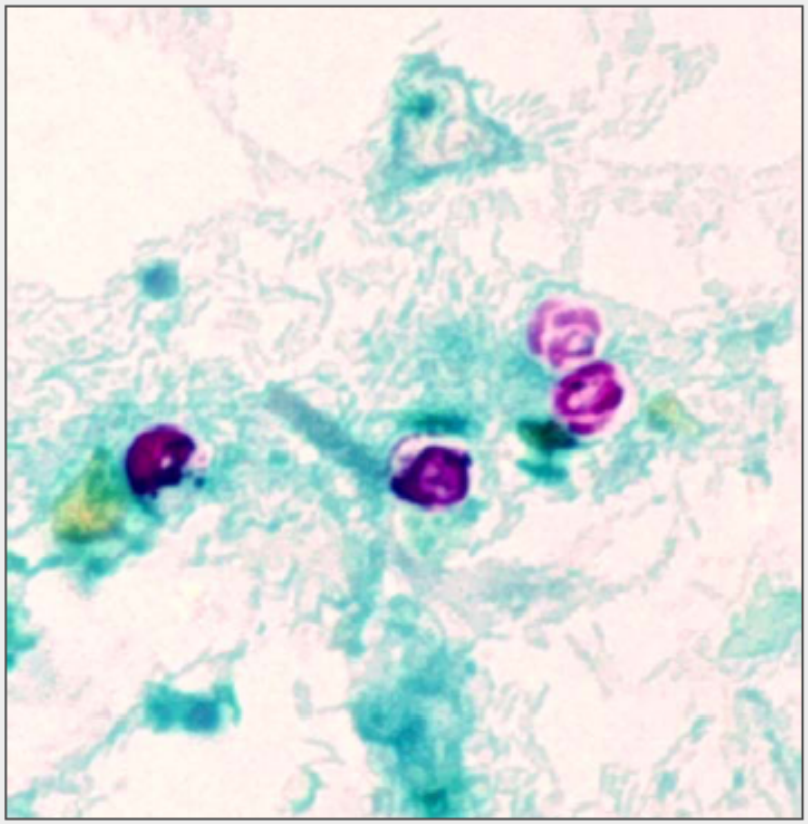


Clinical Features

- Incubation period
  - 1 – 12 days, average 7 days
- Symptoms
  - Diarrhoea
  - Stomach cramps
- Duration of Symptoms
  - Usually short lived, 1 – 2 weeks
  - Immunocompromised – can be chronic

Diagnosis

- Stool specimen
- Detect *Cryptosporidium* Oocysts
  - Acid fast or auramine staining and microscopy
- Antigen detection



Treatment: Cryptosporidiosis

- Immune –competent: self-limited illness
- HIV- prolonged, severe disease; response to antiretroviral therapy and restoration of immunity
- Nitazoxanide (child 1-3yrs) 100mg, 4-11yrs 200mg orally 12 hrly for 3 days may also be effective

In Nepal…

J Clin Microbiol. 1995 Nov;33(11):3058-60.

Prevalence of Cyclospora species and other enteric pathogens among children less than 5 years of age in Nepal.

Hoge CW, Echeverria P, Rajah R, Jacobs J, Malthouse S, Chapman E, Jimenez LM, Shlim DR.

Stools from 124 Nepalese children aged 6 to 60 months with diarrhea were examined for organisms of the coccidian genus Cyclospora and for other enteric pathogens.

Enterotoxigenic Escherichia coli, Giardia Lamblia, Campylobacter species, **Cyclospora species, and Cryptosporidium species** were the most common pathogens identified.

Cyclospora species were detected in none of 74 children < 18 months of age compared with 6 (12%) of 50 children > or = 18 months of age (P = 0.004).

Trop Doct. 2011 Jan;41(1):36-7. Epub 2010 Nov 25.
Prevalence of cryptosporidium species in paediatric patients in Eastern Nepal.
Amatya R, Poudyal N, Gurung R, Khanal B.
Department of Microbiology, BP Koirala Institute of Health Sciences, Dharan, Koshi, Nepal.

We determined the prevalence of cryptosporidiosis in HIV seronegative children 15 years of age and below presenting with diarrhoea in the BP Koirala Institute of Health Sciences, Nepal. Faeces were collected over a 12-month period. Coccidian oocysts were detected using modified acid-fast staining.

Intestinal parasites were found in 9.15% of diarrhoeal stool. Coccidian parasites were observed in 4.4% (with 4.1% cryptosporidium and two cyclospora). Coccidia were the most recurrent parasite found in this study. The detection was throughout the year with clustering during the rainy season.

Southeast Asian J Trop Med Public Health. 2007 Jan;38(1):13-9.

Intestinal protozoal infestation profile in persistent diarrhoea in children below age 5 years in western Nepal.

Mukhopadhyay C, et al epartment of Microbiology,
Manipal College of Medical Sciences, Pokhara, Nepal.

Unlike acute diarrhea, the role of pathogens in persistent diarrhea in children in Nepal is unclear. Protozoal parasites are suspected to be a major cause. The study was carried out to find the association between protozoal agents and persistent diarrhea in children below age 5 years from western Nepal. Stool samples were collected from 253 children with persistent diarrhea, from 155 children with acute diarrhea (disease controls) and from 100 healthy children from the community (normal controls). Of 253 children with persistent diarrhea, 90 (35.5%) had protozoal infections, 63 (24.9%) helminthic infections, 32 (12.6%) had bacterial infections and 16 had mixed infections. Giardia lamblia was the most prevalent (67.7%), followed by Entamaeba histolytica (27.7%). **HIV infection and severe malnutrition were associated with Cyclospora cayetanensis and Cryptosporidium spp causing persistent diarrhea.** We conclude that stool microscopy should be routinely performed in children with persistent diarrhea since protozoal infections can be cured with effective treatment and control can be achieved by proper health education.

Nepal Med Coll J. 2005 Dec;7(2):134-7.

Emerging opportunistic protozoa and intestinal pathogenic protozoal infestation profile in children of western Nepal.

Easow JM, Mukhopadhyay C, Wilson G, Guha S, Jalan BY, Shivananda PG.
Department of Microbiology, Manipal College of Medical Sciences, Pokhara, Nepal.

Intestinal parasitic infestation continues to be of public health importance in many tropical and subtropical countries for their high prevalence and effects on the morbidity in the population. This 5-year hospital-based retrospective analysis was aimed to find out the intestinal protozoal parasitic profile in 1790 pre-school and school-going children visiting the hospital with gastrointestinal illness.

Giardia lamblia was the most prevalent pathogenic protozoan intestinal parasite (73.4%), followed by Entamoeba histolytica (24.4%).

O**pportunistic pathogens like Cyclospora cayetanensis (1.0%) and Cryptosporidium sp. (1.0%) were detected from immunocompromised children below 2 years of age** .

Southeast Asian J Trop Med Public Health. 1999 Mar;30(1):58-63.

Study of Cyclospora cayetanensis in health care facilities, sewage water and green leafy vegetables in Nepal.

Sherchand JB, Cross JH, Jimba M, Sherchand S, Shrestha MP.
Tribhuvan University Institute of Medicine, Public Health Research Laboratory, Kathmandu Nepal.

Cyclospora cayetanensis, a newly emerging parasite, is endemic in Nepal. A total of 2,123 stool specimens were collected from 3 health care facilities based on clinical symptoms during the period between 1995 to October, 1998. Out of these specimens, cayetanensis oocysts were found in 632 (29.8%). To identify possible sources for Cyclospora infection, drinking water, sewage water, green-leafy vegetables including fecal samples of various animals were collected and examined. The vegetable leaves were washed in distilled water then the washings, sewage water and drinking water were centrifuged and the sediment were examined microscopically. As a result, oocyst of Cyclospora were identified in sewage water and vegetable washings on four different occasions in June, August, October and November. The positive results were also confirmed as C. cayetanensis by development of 2 sporocysts after 2 week incubation period in potassium dichromate. A survey of 196 domestic animals from the same areas demonstrated that two chickens were positive for Cyclospora-like organism and others were negative. Although further studies are needed to clarify the direct link between Cyclospora infection and these sources, the results suggest that sewage water, green leafy vegetables are possible sources of infection and chickens could be possible reservoir host of Cyclospora in Nepal.

Lancet. 1995 Mar 18;345(8951):691-3.

Placebo-controlled trial of co-trimoxazole for Cyclospora infections among travellers and foreign residents in Nepal.

7 days treatment sufficient in immune-competent; 10-14 days in IC