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LABORATORY CENTRE FOR DISEASE CONTROL

MATERIAL SAFETY DATA SHEET - INFECTIOUS SUBSTANCES

SECTION I - INFECTIOUS AGENT

NAME: *Cryptosporidium parvum*

SYNONYM OR CROSS REFERENCE: Cryptosporidiosis

CHARACTERISTICS: Coccidian protozoa; sporozoa; sexual and asexual cycles in a single host; sporozoites, trophozoites and merozoites all attach to epithelial cells (generally intestinal cells); mature oocyst contains 4 thin, flat motile sporozoites (2-4 by 6-8 µm)

SECTION II - HEALTH HAZARD

PATHOGENICITY: Characterized by profuse, watery diarrhea, cramping, abdominal pains, weight loss, anorexia, flatulence and malaise; nausea, vomiting, fever and myalgias may also be present; symptoms are self-limiting in healthy individuals; immunocompromised patients including AIDS patients may experience prolonged symptoms with increasing severity

EPIDEMIOLOGY: Worldwide; rate of infection ranges from 1 to 4.5% in developed countries and from 3 to 20% in developing countries; higher infection rates reported in AIDS patients (3-20% in US, 50-60% in Africa and Haiti); frequent outbreaks in daycare centres

HOST RANGE: Vertebrates including humans, poultry, fish, reptile, small and large mammals

INFECTIOUS DOSE: ID₅₀=132 organisms (N Engl J Med 1995; 332:855-9)

MODE OF TRANSMISSION: Fecal-oral route (person to person, animal to person, food and waterborne transmission)

INCUBATION PERIOD: 1 to 12 days; average is 7 days

COMMUNICABILITY: Oocysts, the infectious stage, excreted in stools from onset of symptoms to several weeks after symptoms resolve

SECTION III - DISSEMINATION

RESERVOIR: Humans, cattle and other domestic animals

ZOONOSIS: Yes - acquired through contact with contaminated animal fecal matter, particularly diarrhea

VECTORS: None

SECTION IV - VIABILITY

DRUG SUSCEPTIBILITY: No effective therapeutic agent available; cyclosporine inhibits *Cryptosporidium* growth *in vitro*

SUSCEPTIBILITY TO DISINFECTANTS: Resistant to most disinfectants including 3% hypochlorite, iodophors, 5% formaldehyde; prolonged treatment (18 hours) using 1% sodium hypochlorite with 10% formalin or 5% ammonia reduces infectivity

PHYSICAL INACTIVATION: Heating at 65°C for 30 min reduces infectivity

SURVIVAL OUTSIDE HOST: Oocysts may survive for 2 to 6 months in a moist environment

SECTION V - MEDICAL

SURVEILLANCE: Monitor for symptoms; confirm by microscopic examination of specimens, identification of oocysts in fecal smears

FIRST AID/TREATMENT: Administer supportive therapy and rehydration in normal individuals; spiramycin may decrease diarrheal symptoms in early infections; paromomycin has been effective in AIDS patients

IMMUNIZATION: None available

PROPHYLAXIS: None available

SECTION VI - LABORATORY HAZARDS

LABORATORY-ACQUIRED INFECTIONS: One case was reported in 1983 due to accidental inoculation; although not documented, infections are thought to occur regularly in all laboratories working with this organism (BMBL, 4th ed., 1999)

SOURCES/SPECIMENS: Feces, intestinal biopsy sections

PRIMARY HAZARDS: Ingestion; accidental parenteral inoculation; airborne transmission is also possible

SPECIAL HAZARDS: Naturally and experimentally infected animals pose a risk to laboratory and animal care personnel

SECTION VII - RECOMMENDED PRECAUTIONS

CONTAINMENT REQUIREMENTS: Biosafety level 2 practices, containment equipment and facilities for all activities involving known or potentially infectious materials

PROTECTIVE CLOTHING: Laboratory coat; gloves when skin contact with infectious materials is unavoidable and when working with animals

OTHER PRECAUTIONS: Maintain good personal hygiene and frequent handwashing

SECTION VIII - HANDLING INFORMATION

SPILLS: Allow aerosols to settle; wearing protective clothing, gently cover spill with absorbent paper towel and apply 1% sodium hypochlorite mixed with 10% formalin, starting at the perimeter and working towards the centre; allow sufficient time (approximately 20 hours) before clean up

DISPOSAL: Decontaminate all wastes before disposal; steam sterilization, chemical disinfection, incineration

STORAGE: In sealed container that are appropriately labelled

SECTION IX - MISCELLANEOUS INFORMATION

Date prepared: February 2000

Prepared by: Office of Biosafety, LCDC

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