

SHIGELLOSIS

[Bacillary dysentery.]

SPECIES: nonhuman primates are the primary risk in the laboratory

ETIOLOGY: The type species is *Shigella dysenteriae*, other agents are *S. flexneri*, *S. boydii*, and *S. sonnei*. The first three species are subdivided into serotypes.

GEOGRAPHIC DISTRIBUTION: Worldwide.

THE DISEASE IN MAN: It is seen most often in preschool-age children. A new serotype introduced into tropical areas where the population is undernourished provokes disease in all age groups, particularly children, the elderly, and debilitated individuals. Generally, the incubation period is less than 4 days. The disease begins with fever and abdominal pains, followed by diarrhea and dehydration for 1 to 3 days. A second phase of the symptomatology can last for several weeks. The main symptom is tenesmus; in serious cases, stools contain blood, mucus, and pus. The symptomatology is usually variable. In many countries, strains of *Shigella* resistant to sulfonamides and to several antibiotics have been observed.

THE DISEASE IN ANIMALS: A clinical picture similar to that in man occurs in monkeys.

SOURCE OF INFECTION AND MODE OF TRANSMISSION: The principal reservoir of the infection for man is other humans that are sick or carriers. The sources of the infection are feces and contaminated objects. The **most common mode of transmission is the fecal-oral route**. Outbreaks comprising numerous cases have had their origin in a common source of infection, such as foods contaminated by hands or feces of carrier individuals. Insects, particularly flies, can also play a role as mechanical vectors. Bacillary dysentery is a serious disease with high mortality in nonhuman primates in captivity, but there is doubt that monkeys can harbor the etiologic agent in their natural habitat. **Monkeys probably contract the infection by contact with infected humans**. The infection spreads rapidly in nonhuman primate colonies because the monkeys defecate on the cage floor and also often throw their food there.

ROLE OF ANIMALS IN THE EPIDEMIOLOGY OF THE DISEASE: Of little significance. Cases of human bacillary dysentery contracted from nonhuman primates are known. The victims are mainly children. In highly endemic areas, dogs may shed *Shigella* temporarily. The etiologic agent has also been isolated from horses, bats, and rattlesnakes. Nevertheless, animals other than nonhuman primates play an insignificant role.

DIAGNOSIS: Definitive diagnosis depends on isolation of the etiologic agent by culture of fecal material on selective media. Serologic identification and typing are important from the epidemiologic viewpoint.

TREATMENT: In humans, treatment of dehydration and hypotension is lifesaving in severe cases. The current antimicrobial treatment of choice is trimethoprim-sulfamethoxazole (one double-strength tablet twice a day), or ciprofloxacin (750 mg twice a day; contraindicated in children and pregnant women). Parental hydration and correction of acidosis and electrolyte disturbances are of primary importance. Antispasmodics (e.g., tincture of belladonna) are helpful when cramps are severe. Drugs that inhibit intestinal peristalsis (paregoric, diphenoxylate with atropine) may ameliorate symptoms but prolong fever, diarrhea, and excretion of *Shigella* in feces. Appropriate precautions should be taken both in the hospital and in the home to limit spread of infection.

CONTROL: In man, control methods include a) environmental hygiene, especially disposal of human waste and provision for potable water; b) personal hygiene; c) education of the public and of food handlers about the sources of infection and methods of transmission; d) sanitary supervision of the production, preparation, and preservation of foods; e) control of flies; f) reporting and isolation of cases and sanitary disposal of feces; and g) search for contacts and the source of infection. A live, streptomycin-dependent vaccine, administered orally in three or four doses has given good protection against the clinical disease for 6 to 12 months. Its use is indicated in institutions where shigellosis is endemic. Indiscriminate use of antibiotics must be avoided in order to prevent the emergence of multiresistant strains and to ensure that these medications remain available for use in severe cases. In animals, control consists of a) isolation and treatment of sick or carrier monkeys; b) careful cleaning and sterilization of cages; c) prevention of crowding in cages; and d) prompt disposal of wastes and control of insects.

BIOSAFETY LEVEL: BL-2

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