**Shigellosis**

Shigellosis is caused by the species of genus Shigella that is characterized to be gram-negative, nonmotile, non-spore forming, facultative anaerobic and rod shaped bacteria which are found to be genetically closely related to ***Escherichia coli* (K12 strain MG1655)**. The genus was first discovered in **1897 by Kiyoshi Shiga**. The causative agent is responsible for the occurrence of acute inflammatory response of the intestinal tract which typically leads to dysentery. Reports indicate about 25,000 to 30,000 cases per annum solely in the United States, and the estimated number of deaths range between 74,000 and 600,000 on a global scale which makes the genus as one of the most potent bacteria causing moderate to severe diarrhea worldwide.

**Causative agent**: The four species of the genus Shigella (***S. dysenteriae, S. flexneri, S. boydii, S.sonnei***) are mainly responsible for causing the disease which is observed to be particularly restricted to human hosts. ***S. sonnei*** is the usual pathogen in the United States and Britain, but ***S. flexneri*** is also fairly common. The disease is most prevalent among children (especially 1- to 4year) where the **infectious dose of 10-100 bacteria** are sufficient to cause infection.

**Transmission**: The disease is transmitted by the **fecal-oral route** - primarily by food, fingers, feces, and flies (the four “F’s”) and the chances of spread increases in crowded places. The shigellae are facultative intracellular parasites that generally invade the **epithelial lining of the colon** and multiply within the cells of the colon epithelium thereby causing severe inflammation and death of the cells lining the colon. After invasion, the organism multiplies intracellularly and spread to the adjacent cells leading to destruction of tissues. The bacteria induce the mucosal cell to phagocytose them and then disrupt the phagosome membrane. The organism produces various toxins (endotoxins and exotoxins) that mainly contribute to disease by reproducing in the colon epithelium. For example: ***S. flexneri*** strains produce **ShET1 and ShET2** toxins and ***S. dysenteriae*** strains produce an enterotoxin, **Shiga toxin**. The toxic effector proteins synthesized inside the organism are translocated to the target human cells thereby disrupting the vacuolar membranes. The proteins helpful for the motility of organism are also synthesized inside the host cell for easy spread.

**Symptoms**: The watery stools often contain blood, mucus, and pus thereby causing dysentery. However, the disease is mainly detected by diarrhea, fever, nausea, vomiting combined with painful bowel movements. Symptoms usually begin to appear two to four days after ingestion while the organisms are shed over a period of 1 to 2 weeks. Various biochemical and serological tests are used to identify the isolates. The disease normally lasts an average of 4 to 7 days; in infants and young children it may prove to be fatal and sometimes even lead to seizures. Sometimes, particularly in malnourished infants and children, neurological complications and kidney failure result.

**Treatment**: 1. Good personal hygiene and clean surroundings. 2. The usage of antibiotics is recommended which may shorten the adverse effects of disease symptoms. 3. The intake of electrolytes. 4. Trimethoprim-sulfamethoxazole or fluoroquinolones serves the purpose.