I-INTRODUCTION

Hemorrhagic diarrhea : Bloody colitis (inflammation of the bowel) . The diarrhea is severe with painful abdominal cramps, gross blood in the stool, caused mostly by Escherichia coli, usually by the strain *E. coli* O157:H7. and *Shigella* . ***(William and Melissa 2008)***

Most of the *E. coli* are normal inhabitants of the small intestine and colon (non-pathogenic). Nevertheless, these non-pathogenic *E. coli* can cause disease if they spread outside of the intestines, for example, into the urinary tract , or into the blood stream (sepsis). Other *E. coli* strains (enterovirulent *E. coli* strains or EEC) cause "poisoning" or diarrhea even though they usually remain within the intestine by producing toxins or intestinal inflammation. ***(Hudault, et al., 2001)***

There are four to six groups of *E. coli* strains enterohemorrhagic *E. coli* (EHEC) , enterotoxigenic *E. coli* (ETEC) , enteropathogenic *E. coli* (EPEC) , enteroinvasive *E. Coli* (EIEC) , enteroadherent *E. coli* (EAEC), enteroaggregative *E. coli* (EAggEC) ***(Todar, 2005)***

E. coli O157:H7 can cause a bloody diarrhea due to toxins it secretes when it infects human intestinal tracts. ***(Rendón, et al., 2007).***

E. coli O157:H7 can cause additional complications in children and the elderly; renal failure, anemia, and dehydration especially for children termed Hemolytic-uremic syndrome (HUS) and spontaneous bleeding, organ failures, and mental changes in the elderly . Some of these patients develop disabilities or die. ***(Karamali, et al. 1989)***

Diagnosis is definitively made when *E. coli* O157:H7 is isolated, usually from the patient's stool, and identified as serotype O157 by immunologic tests***. (Chart, et al., 1991)***

Shigella is abacteria closely related to *E. coli* and Salmonella. During infection, it typically causes dysentery. Phylogenetic studies indicate that *Shigella* is more appropriately treated as subgenus of Escherichia, and that moreover certain strains generally considered *E. coli*– such as EHEC O157:H7– are better placed in *Shigella* ***(Hale and Keusch, 1996) .***

Shigella infection is typically via ingestion (fecal–oral contamination); depending on age and condition of the host, as few as 100 bacterial cells can be enough to cause an infection . *Shigella* causes

dysentery that results in the destruction of the epithelial cells of the intestinal mucosa in the cecum and rectum . ***(Levinson, 2006)***

Verotoxin (VT) or shiga like toxin , is a toxin generated by some strains of *E. coli* It is named for its similarity to the AB5-type Shiga toxin produced by the bacteria *Shigella dysenteriae*. ***(Beutin, et al., 1993)*** There are two types of verotoxin , known as (VT1) and (VT2) ***(O'Brien and Holmes, 1987)***

Some strains of *Shigella* produce enterotoxin and shiga toxin, similar to the verotoxin of *E. coli* O157:H7 and other verotoxin - producing *E. coli*. Both shiga toxin and verotoxin are associated with causing HUS. ***(Hale and Keusch 1996).***

The toxin acts on the vascular endothelium. The B subunits of the toxin bind to a component of the cell membrane known as Gb3. Binding of the subunit B to Gb3 causes induction of narrow tubular membrane invaginations, which drives formation of inward membrane tubules for the bacterial uptake into the cell. When the protein is inside the cell, the A subunit interacts with the ribosome's to inactivate them. The A subunit of Shiga toxin is an N-glycosidase that modifies the RNA component of the ribosome to inactivate it and so bring a halt to protein synthesis leading to the death of the cell. The vascular endothelium has to continually renew itself, so this killing of cells leads to a breakdown of the lining and to hemorrhage. The first response is commonly a bloody diarrhea. This is because Shiga toxin is usually taken in with contaminated food or water**.** ***(Römer, et al., 2007) .***