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A Review on Ecoli 0157: H7 (EHEC)

S.Meghana*, P.swetha, K.kalyani

Siddhartha Women's Degree College Kukatpally, Hyderabad
Corresponding Author: Meghana.s, Siddhartha women's degree college Kukatpally, Hyderabad

Abstract:-
Escherichia coli O157:H7 is an important food borne and water borne pathogen is first isolated in 1982, shiga toxin. producing Ecoli O157:H7 which causes diarrhea, hemorrhagic colitis and haemolytic uremic Syndrome in humans. Haemolytic uremic. Syndrome (Hus) is a Serious condition and upto 50% of Hus patients can develop renal acute dysfunction or bloodpressure.

Ecoli 0157:H7 infects the alimentary tract and induces abdominal cramps with hemorrhagic diarrhea and it can be transmitted by person to person through fecal shedding and11%. of infection are estimated.

Enterotoxigenic Escherichia coli (ETEC) strain are the main cause of the diarrheal disease problems. ETEC strains are the bacteria which cause the acute watery diarrhea in chinldren. Diarrheagenic Ecoli infection are more common in Africa countries. The occurance of antimicrobial resistance depends upon the type of antimicrobialagent, bacterial strain, dose, timeand mode of ministration. some of Ecoli 0517:H7 occurs after taking the undercooked meat or deficiency pasteurized dairy products. And some of Ecoli 0157:H7 occurs due ro exposal to contaminated water from potable drinking sources, pools and lakes and foods such as inappropriate washed leafy green vegetables and fruits, apple juice and direct contact with contaminated animals. Ecoli 0157:H7 shiga toxin causes leukocyte aggregation, platelet aggregation, microthrombin formation, apoptosis of affected cells ,renal dysfunction. shiga toxin not only effect kidney but it can also effect in diffuse vasculitic injuries which cause the effect on multiple organ system and organ failure.

Introduction:-
Escheriachia coli (Ecoli) is a Gram bacteria, facultative anearobic bacterium. This microorganisim first discovered by theodor Escherichia in 1885. Ecoli contain a different group of strains Ecoli Can be classified based on serogroups, pathogenicity clinical Symptoms (or) Virulence factor Among them enterohemorrhagic Ecoli is one of most pathogenic Ecoli which produces shiga toxins (stxs). Several serotypes in EHEC are frequently associated with humandiseases such as 026 H11, 091;11 ,0111;48 ,0157; NM and 0157;H7

Ecoli 0157 is the most isolated sterotype of EHEC. EHEC Serotype 0157:H7 was first recognised in 1982 as a human pathogen associated with bloody diarrhea in oregon & michigan, USA. Also linked with sporadic Cases of Hus in 1983 and there is a recent outbreak of Ecoli 0157 in lehi Utah 2023 Aug 14 on detection of Sample collected from pressurised irrigation.

The centres for Disease Control and prevention (CDC) estimated Ecoli 0157:47 infection caused nearly 73000 illness 2200 Hospitalitizations & 60 deaths annually.

The first outbreak of ecoli O157:H7 happened in 1982 and caused due to Contaminated hamburger meat. later on most of the outbreaks during 1980s were food bone with main food products being beef products which is unpasteurizad milk. Infection occured due to white radish Sprouts (michino et al, 1999) fresh Spinach (Brandl 2008) and lettuce (Hilborn et al 1999) Tomatoes and apple Juice frequently involved in McDowell and sheridan 2001). And water borne outbreak have happened in Swerdlow et al 1992; oslen et al, 2002, Bopp et al., 2003) The microorganims are capable of Survival for large period of time in water particular ly at lower temperatures and Some may Survive for more than eight months in a form of water gutter and contaminated water results to an infection. And At nursing homes and day care centers the cases

also reported. on person to person transmission (panaro et al 1990, Reida et al 1994) The infection for which Spreaded from one person to another indicates low infectiousdose The estimatted infectious dose from data is 10-100 CFU (asiffin et al 1994)

Ecoli O157:H7 infection has the ability to produce one or more shiga toxins only toxin production is not sufficient to infect a disease. Two other factors also contribute to virulence ofecoli 0157:H7 The first factor are harboring a 60MD a virulence plasmid (pO157) which encodes hemolysin. The other factor is locus of enterocyte Effectent (LEE).

The LEE contains all the genes necessary for inducing the ALE lesions. They attaches to the gut mucosa.

pO157 plasmid contains hly operon encode, enterohamolysin they may allow bacterium to utilize blood release into intestine as Iron

Shiga toxins produce shigella dysenteriae typel And some of other toxins such as stx1 and stx2are produced by EHEC They share 84-99% of amino acid sequence in stx2 . The binding moietyof these toxins, they bind to humans and animal cells. consists of five subunit . Ecoli 0157 : H7 exxpreses somatic (o)antigen 157 and flagella (H)antigen 7

Eneter hemorrhagic diarrhea-associated Hus these patients have the potential for persistent long term renal dysfunction and extrarenal complications. including seizures, diabetes, chronic wit's& hypertension. The most frequent Severe complication is HUS which occurs most commonlyin children especially in younger children less than 5 years old and in elderly HUS manifests for 5-10 days following the onset of hemorrhagic diarrhea which also present with triad: hemolytic anemia, acute kidney failure and thrombocytopenia.

If patients develop HUS up to 50% consult to a Nephrology as they they require haemodialysisif acute renal impairment Occurs Gastroenterology or infectious disease consultations, may also provide expert quidance

The infection Caused by 0157:H7 can be asymptomatic and they cause bloody diashea, hemorrhagic colitis, hemolytic vremic Syndrome, thrombocytopenia purpura.

Hemorrhagic colitis is a infection with Ecoli 0157:H7 is a symptomatic and incubated for 3-4days it Starts with severe abdominal Cramps. Hemolytic uremic Syndrome mainly occurs in children between 1-5 years of age and also in other age group of around boyos

HUS can result both acute and lifelong illness.Ecoli 0157:H7 has a characteristics those foundin ecoli stain. Ecoli expose to contaminated water, swimming pools and lakes , this contaminated food washed leafy green and fruits .

It linked to other bacteria .In enterohemorrhagic bacteria strain Ecoli 0157:H7 it infects the alimentary tract with hemorrhagic diarrhea.In Globally 2.8 millions causes in a year. In both children and adults illness of diarrhea ecoli 0157 : H7 Sporadically expose of contaminated food sources. Ecoli diseases is low and this bacteria help in maintain the body balance normal intestinal flora against the harmful bacteria . ecoli can causes severe intestainal infections .

In united state Ecoli 0157 :H7 that causes estimated 63000 hemorrhagic.

Generally a Study of 29 children with Hus was confirmed to be caused by Ecoli 0157 : H7 Infected children caused with acute bloody diarrhea.

An Ecoli infection makes a person ill Symptoms of Ecoli begin from two to five days after eating contaminated food or liquids. The most common Symptoms associated with Ecoli 0157:H2 each person have different experience such as Abdominal cramps, Severe bloody diarrhea, little to no little to no fever, fatigue, Nausea etc. This infection is most prone childrenand elder persons.

Ecoli O157:H7 can be detected by using Special stool culture. Generally the stool samples is taken from an individual and it being tested and it gives an outbreak due to which it is Caused.

For, Ecoli O157:H7 Can't be treated they Can't use Antibiotics or other medications such as loperamide. If a person develops Hus they must be hospitalized. According to CDC 3-5% of person who have HUS may due

to complications.

The treatment for E. coli O157:H7 infection, a strain of Escherichia coli bacteria, primarily involves supportive care and close monitoring. This bacterium is notorious for causing foodborne illnesses, often associated with contaminated food or water sources. When infectedwith E. coli O157:H7, patients typically experience symptoms such as diarrhea, abdominal cramps, and sometimes bloody stools.

In most cases, antibiotics are not recommended for E. coli O157:H7 infections because they can potentially worsen the condition by increasing the release of toxins. Instead, treatment focuses on managing symptoms and preventing complications. The primary goal is to keep thepatient well-hydrated, as diarrhea can lead to dehydration. Doctors often advise drinking plentyof fluids, including water, oral rehydration solutions, and clear broths, to maintain proper hydration levels. In severe cases, especially when dehydration is a concern, hospitalization maybe necessary to administer intravenous fluids.

During the illness, it is crucial to avoid anti-diarrheal medications, as they can prolong the presence of the bacteria in the gut. Patients should also refrain from consuming dairy products,caffeine, and alcohol, as they can exacerbate symptoms.

In addition to hydration, rest is essential to help the body recover from the infection. Most cases of E. coli O157:H7 resolve within a week or so without complications, but close monitoring bya healthcare provider is crucial, especially for individuals at higher risk of developing severe symptoms, such as young children, the elderly, and those with weakened immune systems.

Prevention is key in managing E. coli O157:H7 infections. Proper food handling, including thorough cooking of ground beef and avoidance of unpasteurized dairy products and contaminated water sources, can significantly reduce the risk of infection. Frequent handwashing, especially after using the restroom and before handling food, is also essential inpreventing the spread of this potentially harmful bacterium.

Conclusions-

The children with oligoanuric failure presented to medical attention and were evaluated laboratory testing. The length of stay in hospital after. diagnosis of Hus was 12 days and for oligoanuric group and non-oligoanuric group 6days.

Escherichia coli O157:H7 infection Causes bloody diarrhea it is Common Symptom most of patients have several abdominal cramps, fever is less than half. Patients have extreme ages increasing disk for Ecoli 0157:H7 associated diarrhea Antimicrobial to modify. Gents have notbeen shown.

Early recognition of and parenteral volume during Ecoli O157:H7 infections children who areinfected with Ecoli O157:H7 are given intravenous volume expansion need careful monitoring. Ecoli 0157:H7 requires specific stoll culture techniques Treatment of STEC antibiotics and toxin- binders did not prevent HUS. In one SR, washing hands reduce the infection of diarrhea,by 39% Probioties reduced fecal E.Coli 0157 did not improve farm hygjene. Leukocyte often suggest a noninfectious Cause. In Nephrology Consultation if patients develop HUS, require hemodialysis impairment.

In summary, treatment for E. coli O157:H7 primarily revolves around supportive care, focusingon hydration and rest, while avoiding certain medications and foods that can exacerbate the condition. Prevention through safe food handling practices and hand hygiene remains crucial in minimizing the risk of infection.

If you suspect an E. coli O157:H7 infection or exhibit severe symptoms, it is vital to seek medical attention promptly for appropriate evaluation and care.

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