Verotoxigenic E. Coli resulting in Haemolytic Uraemic Syndrome: A Case Report

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Introduction

Verotoxigenic E. Coli (VTEC) are a specific group of the bacterium *Escherichia coli*. In Ireland, the commonest member of this group is *E. coli* O157:H7.[1] Infection with this bacterium can present with a variety of symptoms including bloody diarrhoea and abdominal cramps.

It is spread via consumption of undercooked, infected meat and meat products and via faeces-contaminated water. It can also be spread via contaminated vegetables and other ready to eat foods or via contact with contaminated soil. It can also be spread via direct or indirect contact with infected animals.[2]

This infection is linked with haemolytic uraemic syndrome (HUS) in approximately 10% of cases. HUS is a clinical syndrome characterized by the triad of thrombotic microangiopathic haemolytic anaemia, thrombocytopenia, and acute kidney injury.[3] This complication is most seen in young children and the elderly population, remaining the principal cause of acute kidney failure in children.[1]

Supportive therapy remains the mainstay of treatment VTEC and antibiotic therapy should be avoided.

Case Details

A 20-year-old female, RK, presented to the emergency department with a three-day history of bloody diarrhoea, abdominal cramps and vomiting. The cramps were worse on passing stool and were a 7/10 in pain. She was apyrexial on admission and reported no subjective fevers.

RK was a college student, working as a waitress in a hotel over the summer. She had no history of recent travel or sick contacts. She had no significant medical or family history and was on no regular medications.

On admission, her bloods were grossly normal with only a mildly elevated CRP of 31.5. Differential diagnoses at the time of presentation included, infective gastroenteritis and a new diagnosis of inflammatory bowel disease. The patient was commenced on IV fluids and VTE prophylaxis.

A stool sample was sent for further evaluation including culture and sensitivities as well as faecal calprotectin. It was also decided to perform a sigmoidoscopy rather than a colonoscopy. Sigmoidoscopy showed significant inflammation with erythema, loss of vascular pattern and friability to point of insertion. However, there was relative rectal sparing with some patchiness of inflammation in recto-sigmoid junction and distal sigmoid.

The stool sample was positive for Verotoxigenic E.coli 0157. As this is a notifiable disease, the public health department were informed. The patient was isolated and treated conservatively with IV fluids and antibiotics were avoided. She remained stable and was discharged two days later with verbal advice.

Unfortunately, six days after discharge, RK was readmitted with persistent nausea and vomiting, epigastric pain and two episodes of haematemesis. Her diarrhoea had resolved, and she was passing stool and urine normally. Her abdomen was soft with guarding in the epigastric area but no signs of peritonism. On this admission, her bloods were notably abnormal. She was anaemic (Hb=5.6), thrombocytopaenic (platelets=115) and had a severe AKI (Urea=25.7 and Creatinine=165). She was diagnosed with HUS and taken over care by the renal team with input from haematology. She was transfused two units of red cells and managed conservatively. Over the course of her inpatient stay, her platelets normalised and her kidney function improved without need for platelet transfusion or dialysis.

Haematology & Biochemistry

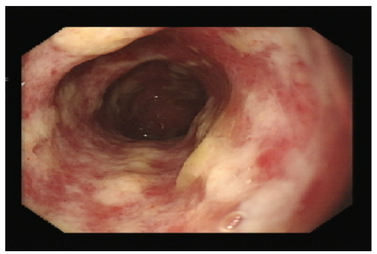
	First Admission 21/09	Second Admission 06/10
Hb	15.4	5.6
WCC	12.6	13.3
Plts	230	115
Urea	3.6	25.7
Creatinine	63	165
CRP	23.3	2.0

Histology

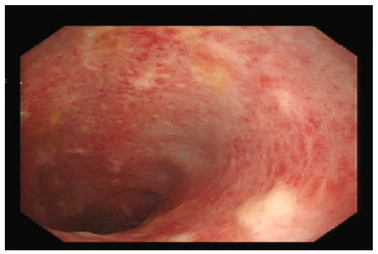
Left Colon Bx	Focal active colitis with focal ulceration attached ulcer slough. No architectural features of chronicity are identified. No granulomas or viral inclusions.
Rectum Bx	Normal colorectal mucosa

Stool Culture & Sensitivity

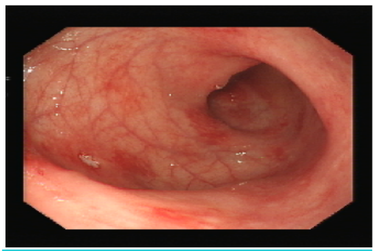
C.Diff negative	Salmonella negative
Shigella negative	Campylobacter negative
Verotoxigenic E.coli positive	



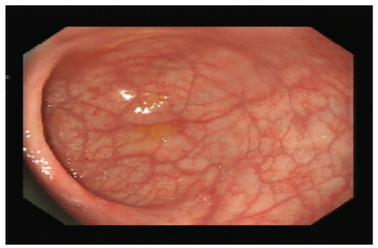
Proximal Descending Colon



Distal Descending Colon



Sigmoid Colon



Rectum

Discussion

This case is particularly topical as there has been an increasing number of outbreaks in Ireland in recent years. In 2017, Ireland had the highest incidence rate for VTEC among EU Member States, reporting ten times the European average that year.

Due to the nature of this diagnosis, a confirmed VTEC infection is a notifiable disease. It is extremely important to involve the local Department of Public Health. This will aid in preventing further spread of infection. Risk factors should be explored including contact with livestock or uncooked meat products.

This case also highlights how it can be difficult to avoid the development of HUS after a VTEC infection. Even though antibiotics were avoided, and the patient was stable on discharge, she still developed this complication. The mainstay of treatment remain supportive therapy with IV fluids and electrolyte replacement. If HUS develops, blood transfusion may be necessary as well as dialysis in more extreme cases.

The mean interval between onset of VTEC diarrhoea and HUS is seven days (range 2-14 days). This well recognised complication most commonly affects those who are under the age of five. HUS is the leading cause of acute renal failure in children. However, children with HUS tend to be less ill than adults, particularly the elderly or immunosuppressed.

Due to the seriousness of HUS, patient education is vital once a VTEC infection has been diagnosed. Patients and their families should be made aware of possible symptoms, including but not limited to, weakness, lethargy, irritability in children and sometimes a purpuric rash.

References

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2. Su C, Brandt LJ. Escherichia coli O157: H7 infection in humans. Ann Intern Med. 1995;123:698–707. https://doi.org/10.7326/0003-4819-123-9-199511010-00009.
3. Canpolat, N. (2015). Hemolytic uremic syndrome. Türk Pediatri Arşivi, 50(2), pp.73-81.