

Escherichia coli O157:H7 in Malta for the first time

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ABSTRACT: The emergence of E coli O157:H7 in Malta is a sign of the times. It represents one of the newly emerging infections associated with food. The first two documented cases of E coli O157:H7 infection in Malta occurred in July and August, 1996. Food types classically incriminated were surveyed by the Department of Public Health. Epidemiological investigation aimed to trace the environmental sources of infection. Microbiology was performed jointly by diagnostic and public health laboratories. Facts about infection and control of the disease are highlighted with a view to alerting local practitioners to the condition.

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E coli O157:H7 infection occupies a low profile amongst Maltese health professionals. With the emergence of the local disease, clinicians should now be alerted to the possibility of this condition in their patients. Hence the scope of this paper.

As fever is commonly not marked in patients with E coli O157:H7 colitis, non-infectious conditions are important in differential diagnosis (Table 1). Abdominal pain and tenderness are known features of the disease and patients may come to exploratory laparotomy ¹, as in Case 2 below. Meanwhile, microbiological laboratory diagnosis is simple, inexpensive, and invaluable for patient management, outbreak investigation and contact screening.

Table 1 - Differential diagnosis of E coli O157:H7 colitis

Infectious	Non-infectious
<i>Shigella</i> , <i>Salmonella</i> , <i>Campylobacter</i> , <i>Yersinia enterocolitica</i> , <i>Clostridium difficile</i> , <i>Entamoeba histolytica</i>	Ulcerative colitis, Crohn's disease, Intussusception, Ischaemic colitis, Diverticulosis, Appendicitis

Apart from their curative role, health care workers are in a strategic position to help limit infection through personal hygiene and patient education (Table 2). A raised index of suspicion coupled with reasoned timely action (treating patient and notifying disease) can avoid

much of the harm classically associated with complicated E coli O157:H7 disease.

The first two documented cases of E coli O157:H7 infection in Malta were recorded in the summer of 1996.

Table 2 - The take-home messages

- All cases of suspected food-borne disease are to be notified to the Department of Public Health for further follow-up. The legal obligation on doctors to notify is intended to limit preventable transmission of infection
- E coli O157:H7 has to be excluded in episodes of bloody diarrhoea
- Haemolysis and renal insufficiency in connection with gastroenteritis should be considered a likely case of E coli O157:H7, more so in paediatric patients. Close monitoring and timely expert opinion are crucial
- Most cases of gastroenteritis can be managed without antimicrobials, which at times may actually be harmful. There is evidence that patients with E coli O157:H7 given antibiotics have similar or increased risk for HUS compared to those not receiving antimicrobials ^{2,3}.
- Adequate cooking of food lowers the likelihood of food-borne illness. Cross contamination of ready to eat food with uncooked meat has been implicated in a recent outbreak of E coli O157:H7 in the US ⁴.
- Consumption of known risky food items like rarely cooked meats, raw milk products, unwashed vegetables and untreated surface water should be avoided.
- For health care workers and child minders, proper hand hygiene is emphasised particularly after physical handling of symptomatic persons or body substances

Case 1

On 10 July 1996, at the St Luke's Hospital (SLH) Bacteriology Laboratory, E coli O157 was isolated from the stools of a foreign patient seen at a Health Centre on 7 July with a 2 day history of gastroenteritis. The strain was further characterised by Evans Public Health Laboratories as E coli O157:H7; phagetype 32; VT2. As the laboratory request form was incompletely filled, the patient - known to be a 28-year old female foreigner - could not be located despite diverse attempts by the Department of Public Health. Hence the patient remained ignorant to the diagnosis, and epidemiological research was defeated.

Case 2

Case 2 was a 47 year old male tourist from the UK who arrived in Malta on August 10, 1996 with his wife and 13-year old daughter. He worked in the UK as a social security inspector, was previously well and had no significant medical, social, family or drug history.

On 15 August, the patient developed profuse watery diarrhoea. This was preceded by constipation for 3 days. On 18 August he developed nausea and vomiting, and the colicky-type abdominal pain shifted to the right side of the abdomen. Examination revealed mild fever, dehydration and tenderness in the right iliac fossa with muscle guarding. He was hospitalised for further assessment. Routine blood investigations showed mild polymorphonuclear leucocytosis and save for pyuria normal renal function. Renal insufficiency did not occur at any stage.

He underwent exploratory laparotomy on the day of admission. Marked mesenteric lymphadenitis and serous peritonitis were noted at operation. Appendicectomy was performed. Twelve hours post-operatively he had an episode of fresh bleeding per rectum (about 150cc) which was managed conservatively. He was given co-amoxyclav tid intravenously (later orally) and gentamicin intramuscularly was added for one week. Antimicrobials were continued till the 26 August. Following the preliminary stool findings, the patient was barrier nursed from 22 August. He made an otherwise uneventful recovery and was discharged on 28 August.

Table 3 - Blood & Urine Findings (Case 2)

Date Aug'96	Parameter	Value	Reference Ranges
18	WBC	12.1 X 103/uL	4.5-10.5 X 103/uL
	Lymphocytes	10.0%	20.0-50.0%
	Granuloytes	81.8%	30.0-70.0%
19	Urine deposit	RBC + WBC ++ Epithelial cells +	

Differential diagnosis

The differential diagnosis for cases of E coli O157:H7 infection include other infectious causes of enteritis with blood, like Shigella, Salmonella, Yersinia, Clostridium difficile and Entamoeba histolitica. Non-infectious

causes leading to a similar clinical picture include inflammatory bowel disease, intussusception, ischaemic colitis, diverticulosis and appendicitis.

In both the cases mentioned, isolation of the causative organism clinched the diagnosis. It is well established that surgical exploration may be indicated (as in case 2) as an emergency to exclude acute surgical conditions.

Epidemiological investigation

Case 2 is known to have arrived in Malta 5 days before starting to feel unwell. Given a known incubation period of 1-8 days, infection may well have been imported. Both his wife and child were asymptomatic and screened by stool culture. They tested negative. An extensive food history was taken from the index case, and four possible source food outlets identified. These included the hotel, a pleasure cruise boat, a restaurant and a supermarket. Sample food items were taken from all these outlets as well as their suppliers and tested at the Public Health Laboratories in Valletta. Items included ground beef products, ham, cheese, cheeselets, poultry, eggs, vegetable and swimming pool water. Hand swabs from food handlers and working tops were also taken. There were no relevant findings.

Since September 1994, all stool samples submitted to the SLH Bacteriology Laboratory for culture (over 4000 so far) have been screened for E coli O157 using standard isolation techniques. Up to the time of writing (October 1996), only the two cases mentioned were confirmed as toxigenic E coli O157:H7. Phagotyping and toxigenicity tests were done at the Evans Public Health Laboratory (PHL), Valletta.

From July 1995, a variety of meat-based food items have been analysed for E coli O157:H7 at PHL. Typical items sampled included beef, chicken and ham burgers, minced meats and imported and local sausage. A total of 595 samples were tested up to 20 September 1996, sourced from various suppliers and retailers throughout the country. E coli O157 was cultured once from a raw beef burger (September 1996): the isolate, however, was non-toxicogenic and did not react with phages.

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References

1. Ostroff SM, Griffin PM, Tauxe RV et al. A state-wide outbreak of E coli O157:H7 infections in Washington State. Am J of Epidem 1990; 132:239-247.
2. Pavia AT, Nichols CR, Green DP et al. Haemolytic uraemic syndrome during an outbreak of E coli O157:H7 infections in institutions for mentally retarded persons. Clinical and epidemiological observations. Journal of Ped 1990; 116:544-551.
3. Ostroff SM, Kobayashi JM, Lewis JH. Infections with E coli O157:H7 in Washington State: the first year of state-wide disease surveillance. JAMA 1989; 262:355-359
4. Cannon M, Thomas H, Sellers W et al. Outbreak of E coli O157:H7 Infection - Georgia and Tennessee, June 1995. MMWR1996; 45(12):250-51.

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