Lemierre's syndrome secondary to *Fusobacterium necrophorum* infection, a rare cause of hepatic abscess

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Abstract

An 18 year old male was admitted to the Accident & Emergency department with complaints of abdominal pain, vomiting and diarrhoea. He was clinically jaundiced and further CT scan suggested liver abscess. Later on blood cultures showed gram-negative bacilli and a further liver aspirate culture confirmed the presence of the rare *Fusobacterium necrophorum*. A diagnosis of hepatic abscess secondary to Lemierre's syndrome was made and patient was treated with appropriate antibiotics. Lemierre's syndrome, although a rare condition, may be associated with serious life-threatening complications. Early recognition and treatment is essential in successfully treating this rare condition. A review of Lemierre's syndrome is presented.

We recommend clinicians to be aware of this condition (Lemierre's Syndrome) especially when dealing with young patients with sore throat and jaundice. It is important for primary care physicians to be aware of this condition as they are discouraged from prescribing antibiotics for young patients with sore throat. Although it is a rare condition, it is associated with severe life threatening complication like liver abscesses. (Acta gastroenterol. belg., **2009**, 72, **444-446**).

Key words : hepatic abscess, sore throat, Lemierre's syndrome, *Fusobacterium* species.

Case report

An 18 year old male of Afro-Caribbean origin was admitted to the Accident & Emergency (A&E) department with complaints of abdominal pain, vomiting and diarrhoea of a few days duration. Further history suggested a recent sore throat, which resolved spontaneously. There was no history of per rectal bleeding.

He had a past history of sickle cell disease with the last sickle crisis noted some 10 years ago. He was a non – smoker and drank alcohol occasionally. He was on regular oral penicillin V tablets for sickle cell disease prophylaxis.

On examination, he appeared unwell and was pyrexial at 39.5°C, with a blood pressure of 92/55 mm Hg and tachycardic at 126 bpm. He was clinically jaundiced. On abdominal examination, there was right upper quadrant rebound tenderness without any guarding. Respiratory system examination was normal.

Blood tests including blood cultures were taken at this point, results of which are shown in Table 1. He was empirically started on intravenous cefuroxime 750 mg thrice daily. A chest radiograph showed features of bilateral consolidation. Computerised tomography (CT) of the abdomen (Fig. 1) showed evidence of liver abscesses with some fluid in both para-colic on the right side of the inferior edge of the liver. Blood culture results showed gram-negative bacilli sensitive to metronidazole, clindamycin and penicillin.

Table 1. — **Laboratory values of the patient**

Variable	Value	Normal Values
Haemoglobulin	6.7 g/dL	(13.5-17.5)
White cell count	69×10^9/L	(4.0-11.0)
Platelets	235×10^9/L	(150-400)
Neutrophils	64.1×10^9/L	(2.0-7.7)
Sodium	135 mEq/L	(135-144)
Potassium	3.5 mEq/L	(3.3-5.3)
Urea	15.7 mmol/L	(2.1-7.6)
Creatinine	186 µmol/L	(56-127)
C- Reactive Protein	336 mg/L	(1-8)
Bilirubin	260 µmol/L	(7-23)
Alkaline Phosphatase	75 U/L	(30-125)
Alanine Transferase	341 U/L	(5-45)
Prothrombin Time	18.4 seconds	(10-13)

He was a started on intravenous metronidazole in addition to the cefuroxime and also had 3 units of blood transfusion as his haemoglobin was low at 6.7 g/dL.

Following antibiotics treatment he was afebrile for 24 hrs, however he became febrile again, and with a temperature 38.6°C and he was transferred to the High Dependency Unit (HDU) as he was unwell and septic. An ultrasound guided liver abscess aspiration was done and 3 mL of pus was aspirated which was sent for further analysis and culture. His antibiotics were empirically changed to tazocin 4.5 g tds and clindamycin 600 mg qds.

A report from microbiologists subsequently confirmed the presence of *Fusobacterium necrophorum*. He was too unwell at this point for a CT chest and neck ; therefore an ultrasound of the neck was done. This ruled out any evidence of jugular or subclavian vein thromboses. At this point, diagnosis of Lemierre's syndrome was established.

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Submission date : 11/04/2009
Acceptance date : 19/05/2009

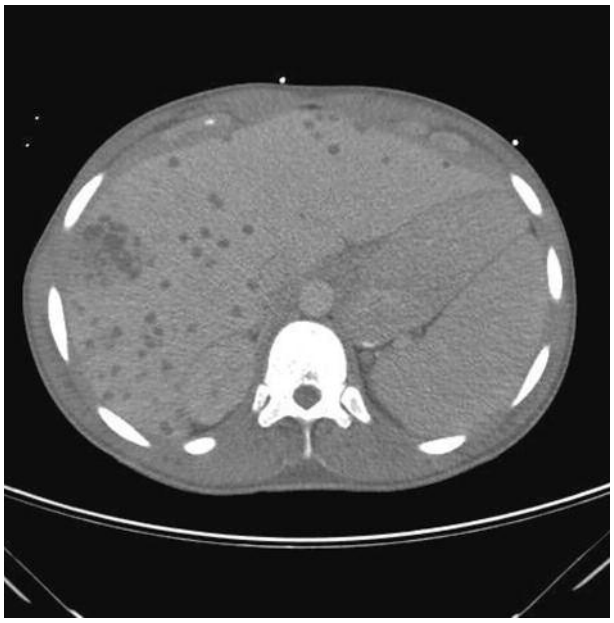

Fig. 1. — Computerised Tomography of the abdomen showing evidence of liver abscesses.

Repeat blood tests reported a reduction in the neutrophil count from 36.3 to 22.4 $\times$ 10^9/L.He continued to improve symptomatically and was transferred to a medical gastroenterology ward. His C-reactive protein (CRP) normalized after 3 weeks of intravenous antibiotic treatment. A repeat ultrasound abdomen showed that liver has improved considerably and a repeat blood culture was negative for any organism. CT chest and neck done at this point did not show any evidence of jugular or subclavian veins thrombosis.

He was subsequently discharged from hospital following 5 weeks of intravenous antibiotic therapy. He has since been followed up in the gastroenterology clinic. His liver function tests (LFTs) and ultrasound of the liver were within normal limits.

Discussion

Lemierre's syndrome (LS) is a rare condition caused by *Fusobacterium necrophorum*, a gram-negative bacillus. It can also be caused by infection with other *Fusobacterium* organism such as *Fusobacterium varium*, *nucleatum* and *mortiferum*.

It is named after Andre Lemierre, who in 1936 published a series of 20 cases of patients with throat infections of whom 18 did not survive (1). In the pre-antibiotic era, LS was a well recognised entity and was invariably fatal. Death was secondary to rapidly developing septicaemia and embolic spread to various organs. The synonyms for the condition are necrobacillosis and post-anginal sepsis.

It has a low prevalence of 0.8 cases per million in general populations, being so uncommon ; it is sometimes called the "forgotten disease" (2). The mortality rate is 6-15%.

Although it is rare, it can cause potentially life threatening complications. In 1999 there was a marked increase in the number of *Fusobacterium necrophorum* bacteraemia reports to Public Health Laboratory Service Communicable Disease surveillance centre, London (3). It has been postulated that the increase in Lemierre's syndrome may be related to General Practitioners being adviced to avoid prescribing antibiotics for conditions believed to be primarily of viral etiology like sore throat. LS usually affect healthy, young adults. The events leading onto Lemierre's syndrome starts with tonsillitis leading on peri-tonsillar abscess which lead on to thrombophlebitis of the tonsillar vein. Finally the infection spreads to internal jugular vein after reaching the lateral pharyngeal space from the tonsillar vein. *Fusobacteria* produce a lipopolysaccharide endotoxin and subsequent haemagglutinin production leads on to clumping of platelets and septic thrombi formation (4).

Patients initially complain of sore throat, beginning as pharyngitis or tonsillitis and subsequently develop septic embolisation to various organs causing abscesses in lungs (5), brain, endocardium, joints or liver (rare). Neurological complications like meningitis and cranial nerve palsies have been reported (6). In a series of LS, it was noted that 82.5% of patients had sore throat, 52% of cases had redness around the neck due to inflammation of neck veins ; the commonest site of embolisation was lungs in most cases (7). Jaundice was uncommon in this study. Although liver abscesses in LS have been reported, (8) they are few in literature.

Despite *Fusobacterium* being Gram negative, it is found to be very sensitive to Penicillin. Busch *et al.* reported on results of testing 13 respiratory tract isolates of fusobacteria collected in the early 1970s and reported that more than 90% were highly sensitive to penicillin (9).

Some studies have found that 100% of *Fusobacterium necrophorum* strains are sensitive to metronidazole, ticarcillin-clavulanate, cefoxitin, co-amoxiclavulanic acid, and imipenem (3). Duration of treatment with antibiotics would depend upon the severity of the disease and response to treatment. Our patient required 5 weeks of intravenous antibiotics treatment.

Usually affecting healthy, young adults, it is unclear as to how the *Fusobacterium necrophorum* organism enters the body, with the frequency of cases mostly in the teens and adolescence ; the entry of the organism may coincide with tonsillar tissue becoming atrophied in late adolescence and teens (10).

A recent study of 156 patients with oropharyngeal infections who eventually developed LS showed that the occurrence was 1.2% (11).

Some authors advocate the use of anticoagulants once the diagnosis of Lemierre's syndrome is established (12). They suggest that anticoagulation would help in earlier resolution of thrombophlebitis and septicaemia. With no

clear guidelines on anticoagulation in LS, clinicians should consider this carefully with the clinical situation of patients balancing the risks and benefits of it.

We wanted to highlight this rare condition with sore throat being very common finding in young and healthy adults. Although, it would not be appropriate to suspect LS in all patients with sore throat, we recommend clinicians to ask patients to report back to them if their symptoms worsen or persist. Our patient had sickle cell disease. Although liver abscesses have been reported in patients with sickle cell disease (13), Lemierre's syndrome in a sickle cell disease has not been reported previously. LS, a potentially life threatening condition, is usually seen in young and previously healthy subjects. We recommend clinicians to be aware of this condition especially when dealing with young patients with sore throat. It is especially important for primary care physicians to be aware of this condition as they are discouraged from prescribing antibiotics for young patients with sore throat.

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