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Mohammad Zeeshan
Aga Khan University

Seema Irfan
Aga Khan University

Ishfaq Ahmed
Aga Khan University

Case Report

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Mohammad Zeeshan,[1] Seema Irfan,[2] Ishfaq Ahmed[3]

Department of Microbiology,[1,2] Department of Medicine,[3] Aga Khan University Hospital, Karachi, Pakistan.

Abstract

The spirochetes inhabiting the large intestines of humans and animals consist of a diverse group of related organisms. Intestinal spirochetosis caused by Brachyspira pilosicoli is a newly recognized enteric disease of human being and animals manifest as mild colitis and diarrhoea. Few cases have been reported of spirochetaemia especially in critically ill and immunocomprised patients. This is another case of spirochetaemia in a patient diagnosed as a case of chronic liver disease secondary to hepatitis C virus, presented in emergency room with history of fever, abdominal pain and slightly altered mental state. Brachyspira pilosicoli was isolated in anaerobic blood culture bottle.

Introduction

Spiral shaped organisms were first observed in faeces, using the light microscope, more than a hundred years back.[1] Initially it was thought to be associated with cholera, dysentery, and other intestinal conditions, but later studies described the presence of spirochetes in the faeces of normal healthy subjects as colonizers of intestinal tract, and similar organisms were also found in the intestinal tracts of various other animal species.[2]

Brachyspira hyodysenteriae was already known as a cause of swine dysentery in veterinary practices. However, two new species, B. pilosicoli and B.aalborgi are now considered as the agent of intestinal spirochetosis in humans.[3] Among these, B. pilosicoli is comparatively easier to grow than B.aalborgi in routine clinical microbiology lab. B. pilosicoli has a broad range of natural hosts, including swine, mice, rats, dogs, and chickens.

Intestinal spirochetosis (IS) has been referred when these organisms are typically attached by the tip to the apical surface of the columnar epithelial cells. Although the spirochetes can form a dense layer visible by light microscopy, signs of tissue damage or inflammation are usually absent.

Cases of blood stream infection (spirochetaemia) have been reported. This is another case of Spirochetaemia.

Case Report

A 48 years old male patient, diagnosed in 1997 as a case of chronic liver disease secondary to hepatitis C virus infection with repeated hospital admissions due to grade II and grade III porto-systemic encephalopathy presented to the emergency room with complaints of low grade fever, drowsiness and disorientation for a day. He was examined and found to be drowsy and minimally arousable, ichteric and fever of 38°C. He was haemodynamically stable and no other remarkable physical clinical finding was observed. He was admitted with initial diagnosis of porto-systemic grade III encephalopathy. Urea, creatinine, electrolyte, complete blood count, liver function test, coagulation profile and blood culture were tested. Urea, creatinin and electrolytes were with in normal range. Platelet counts were 36×10^9/L. Total bilirubin 2.7mg/dl, albumin 2.6mg/dl, prothombin time 25.6/12 seconds, INR 2.15 ratio. Patient received Lactulose 30ml, Tablet Flagyl 200mg 8 hourly and Injection Ceftriaxone 2000mg 12 hourly which was continued till the time of discharge (for 10 days).

Blood culture became positive within 48 hours in anaerobic bottle only. Initial gram stain of blood showed curved gram negative rods. Specimen was subcultured on sheep blood agar, chocolate agar and MacConkey agar for initial isolation and incubated aerobically at 37°C. SIM (sulphide-indole-motility) was set for identification. No growth was noticed on primary culture plates and neither any reaction in SIM after 48 hours of incubation. At that point differential diagnoses was Treponema, campylobacter, spiral shaped organisms such as Anaerbiospirillum and Brachyspira species.

Tests for these diseases were done in routine microbiology laboratory, including dark field microscopy,

directly from the specimen which was unremarkable. Specimen was also subcultured on campylobacter plates, providing microaerophilic environment by incubation at 42°C for 48 hours. No growth was observed on campylobacter test plates after 48 hours. All primary plates were also resubcultured and incubated anaerobically and for another 15 days with positive and negative controls. Sensitivity against anaerobes was also set on Mueller-Hinton agar by disc diffusion method.

Anaerobic plates were reassessed after a week of incubation. MacConkey plate had no visible growth, there were very fine pin point yellowish colonies on chocolate agar while sheep blood agar plate showed fine pin point whitish colonies with very weak beta haemolysis and susceptible to metronidazole diagnostic disc. Spiral shaped gram negative rods were observed on gram staining made directly form culture plates. Colonies were oxidase negative and catalase positive. One of the differential diagnoses was Anaerbiospirillum species which doesn't have beta haemolytic property and was both oxidase and catalase negative. Therefore, diagnosis of exclusion was used for the intestinal spirochetes including Brachyspira species. Definite identification required 16sRNA sequencing which we were unable to perform.

B.pilisicoli is an intestinal spirochete and the only human pathogen. The phenotypic characteristic of the isolated organism i.e. spiral gram negative rod, weak beta haemolysis, oxidase negative and catalase positive, indole negative is consistent with B.pilisicoli. Organism was sensitive to Penicillin, Metroniadazole, Imepenem, Tazocin, Chloramphenicol, and Augmentin.

Discussion

In this report, we have described a case of Brachyspira blood stream infection with reference to sepsis in an immunocompromised patient. Isolation of pathogenic and nonpathogenic spirochetes from stool specimens and rectal biopsies of diseased as well as from healthy persons has been reported in the early eighties. However, in this era of high prevalence of the immunocompromised population, isolation of these organisms is of significance.

B. pilosicoli in humans has variable faecal carriage, depending on the population group being investigated[4-6] and colonization was most common in individuals living in crowded pre-urban areas and with the use of well water. Therefore, transmission is probably through faecal oral route. Different studies confirms that colonization with B. pilosicoli is common in humans in developing communities in comparison to western countries and that may present a considerable burden on human health in many regions.[7]

In addition, to the spirochete's ability to colonize the large intestine, B. pilosicoli has been isolated from the bloodstream of a small number of immunocompromised patients in France, the USA and Greece.[8-10] No case of spirochetaemia is reported from developing countries, although, literature has supported the higher prevalence of colonization in these densely populated areas. In this case, there is a probability of translocation of spirochetes from gut as the patient had chronic liver disease. A clear association between intestinal spirochetes and disease has not been established. Rectal biopsy and 16rRNA detection is considered as the more reliable method of detection, commercial kits or serologic procedures for detection of human intestinal spirochetosis are still not available, and no data on antimicrobial susceptibility or treatment have been reported.

Conclusion

In immunocomprised patient population, intestinal spirochetes could be in the list of the differential diagnosis, if spiral shaped gram negative rods are detected. However, there is a need of more information for establishing the potential medical importance of these organisms along with different phenotypic characteristics of this organism which can easily be identified in routine microbiology laboratory along with sensitivity pattern and its pathogenesis.

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