Campylobacter jejuni health essay

Campylobacter jejuni is one of a family of bacteria known as Campylobacteriaceae that collectively are responsible for a significant number of reported cases of gastroenteritis in the UK. Gastrointestinal infection with Campylobacter spp. can produce significant long term sequelae, such as reactive arthritis and the neurological condition Guillain-Barre Syndrome. This report will give a brief overview of campylobacter jejuni with regard to its microbiology, and the identification and management of campylobacter infection.

Campylobacters were recognised as a cause of human illness in the 1970s, but were probably first identified in humans by Escherich in 1886, who identified spiral shaped bacteria of the colons of children who had died from a condition he called “ cholera infantum” (Escherisch 1886). Veterinary research at the beginning of the twentieth century identified similar bacteria in livestock, and the bacteria (termed at the time “ vibrio” or “ spirillium”) was implicated in a number of reported cases in both animals and humans throughout the mid-twentieth century (Butzler 2004). The key breakthrough was reported in 1972, when Dekeyser and Butzler were able to isolate the bacteria now known as campylobacter jejuni from the stool of an infected patient (Dekeyser 1972).

Campylobacter spp. are classified as part of rRNA superfamily VI, a classification of bacteria that also includes Helicobacter and Arcobacter (Vandamme 1991). Campylobacters, and other members of the classification, are small, gram-negative bacteria that are specially adapted to colonise the surface of the mucous membranes of the digestive tract. This is reflected in the morphology of the bacteria, which has a spiral-shaped body

with long unsheathed flagella at each tip. Consequently, Campylobacter are highly motile, and are able to tunnel through the mucous layer and colonise the membrane below, which is a key ability as they are highly susceptible to acidity. They are partially anaerobic, alongside other members of the classification, and undergo transformation to coccoid forms when exposed to adverse conditions (Moran 1987). Presently, 18 subspecies of Campylobacter have been identified and 11 of these are thought to be pathogenic in humans. By far the most common are campylobacter jejuni and campylobacter coli; together, these bacteria are a leading cause of diarrhoeal illness.

Principal risk factors for infection with campylobacter jejuni include the consumption of undercooked meat, especially poultry, inadequately pasteurised milk, contaminated water and pets with diarrhoea (Gillespie 2008). There may be human-human transmission via the faeco-oral route if personal hygiene is unsatisfactory (Wilson 2008).

There is an incubation period of around 3 days, though this can range from 1-7 days. There is occasionally a prodromal illness of fever, myalgia and headache lasting around 24 hours, and patients who present with the prodromal illness often have a more severe infection than those presenting with gastrointestinal symptoms (Minton 2004). The principal illness is characterised by colicky, periumbical abdominal pain, pyrexia (the fever may be as high as 40â?°C) and profuse diarrhoea, often with up to 10 bowel movements each day. The stool may be watery initially, and blood may appear in the stool as the infection progresses. Around 25% of patients will experiences tenesmus (Minton 2004).

Symptoms of diarrhoea generally last for up to 7 days, and abdominal pain may persist a little longer. The illness is generally self-limiting, though the prognosis can be worse in the very young, the elderly, those with comorbid condition and the immunocompromised (Nelson 2004).

It is not possible to differentiate campylobacter infection from other causes of infective gastroenteritis based on history and examination findings alone (Buss 2015). Therefore, detection of campylobacter in a stool sample is the mainstay of diagnosis, though a negative sample cannot exclude the presence of campylobacter. Samples are rarely positive after two weeks. Stool samples should always be collected in patients presenting with these symptoms, as infection with campylobacter is a notifiable disease in England and Wales (NICE 2014).

In a generally fit and well adult, the main risk of acute diarrhoea of any cause, including campylobacter, is dehydration. Therefore, maintaining adequate hydration is the cornerstone of treatment. This can generally be achieved by increasing oral fluid intake, but in vulnerable patients intravenous hydration may be indicated. Rehydration may be encouraged with the administration of Racecadotril. Racecadotril is an intestinal antisecretory enkephalinase inhibitor that inhibits the breakdown of endogenous enkephalins, reducing the hypersecretion of water and electrolytes into the intestine (NICE 2013). Racecadotril is licensed in the United Kingdom for the complimentary treatment of acute diarrhoea in patients aged greater than 3 months, together with oral rehydration.

Though the symptoms of campylobacter infection are unpleasant and inconvenient, there is generally no indication for antimotility medications. In fact, unless the diagnosis is confirmed via the laboratory, these medications are contraindicated as toxic megacolon has been reported as an adverse effect of antimotility medications in patients with pseudomembranous colitis and inflammatory bowel disease (Minton 2004).

Given the short duration and self-limiting nature of the condition, antibiotic therapy is generally not recommended. A Swedish meta-analysis of eleven randomised control trials reported that, versus placebo, antimicrobial therapy reduced the duration of intestinal symptoms by only 1. 3 days (95% CI 0. 6-2. 0 days) (Ternhag 2007). A further review by the National Institute of Health and Care Excellence (NICE) reported that antibiotic treatment with erythromycin cleared the bacteria from stool samples rapidly, but had no effect on the course of the disease (NICE 2009).

Problems exist with antibiotic-resistant species of campylobacter, largely due to antibiotic use in animals (Gallay 2007; Lehtopolko 2010). However, antibiotic therapy should be considered for patients with severe disease or at risk of severe disease. Patients with severe disease include individuals with bloody stools, high fever, extra intestinal infection, worsening or relapsing symptoms, or symptoms lasting longer than one week (Ruiz-Palacios 2007). Patients classified as at risk of severe disease include the immunocompromised, the elderly and pregnant women. NICE supports this, suggesting that antibiotic therapy may be indicated if any of the following occur (NICE 2014):

- High fever
- Bloody diarrhoea
- More than eight stools daily
- Worsening clinical condition
- Illness for over a week
- Pregnancy
- Immunocompromise

Should an antibiotic be required, azithromycin and erythromycin are the most effective agents against campylobacter in the UK, with a single 30mg/kg dose of azithromycin early in the disease proving just as effective as a 5 day course of erythromycin (Vukelic 2010). The British National Formulary recommends a combination therapy of clarithromycin with ciprofloxacin as an alternative.

There are a number of complications of campylobacter infection. Acute bacterial gastroenteritis has been linked with the onset of irritable bowel syndrome in around 15% of cases — this is termed post-infective IBS (Smith 2007). Further complications include Reiter’s Syndrome (a form of reactive arthritis characterised by urethritis, conjunctivitis and arthritis), and the neurological condition Guillain-Barre Syndrome.

In summary, campylobacter jejuni is a gram negative, spiral shaped bacteria that colonises the mucous membranes of the gut. This colonisation produces a self-limiting illness characterised by fever, cramping abdominal pains and diarrhoea. Infection is diagnosed via detection of the bacteria in a sample of faeces. The mainstay of treatment is rehydration — antibiotics are rarely indicated.

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