Original article

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The incidence of bacteraemia after argon plasma coagulation in patients with chronic radiation proctocolitis

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Abstract

Aim Argon plasma coagulation (APC) is considered a safe treatment for haemorrhagic chronic radiation proctocolitis (CRPC), but bacteraemia is a rare complication. The study aimed to evaluate the frequency of bacteraemia after APC.

Method A prospective study of 21 patients who underwent APC (30 procedures) for CRPC was carried out. Blood cultures (Bactec®) were obtained before and 30 min after the procedure (60 samples total). Patients were monitored for 48 h after the procedure to detect signs of infection.

Results None of the 21 patients had fever or any sign suggestive of infection after any of the 30 sessions. All baseline blood cultures were negative and two (7%) of the 30-min blood cultures were positive (*Staphylococcus hominis* $n = 1$; *Streptococcus bovis* and *Rhodotorula* sp $n = 1$). The first was likely to be a contaminant and the second patient had no evidence of any other colonic disease (neoplasia or polyps) beside CRPC.

Conclusion APC is a low-risk procedure regarding bacteraemia and does not warrant prophylactic antibiotic administration.

Keywords Bacteremia, argon plasma , chronic radiation proctocolitis

Introduction

Bacterial translocation of endogenous microbial flora into the bloodstream may occur during any endoscopic procedure [1]. The reported rates of bacteraemia associated with flexible sigmoidoscopy vary between 0% and 1%. There are numerous reports of bacteraemia after colonoscopy, with a mean rate of 4.4%, ranging from 0% to 25% [2,3]. When considering therapeutic lower gastrointestinal tract procedures, the incidence of bacteraemia varies with haemorroidal injection sclerotherapy (2%) and laser therapy of colorectal stenosis (34%) [2]. It has been postulated that the incidence of bacteraemia during colonoscopy might be related to degree of colonic distension [4].

Argon plasma coagulation (APC) is established as an effective treatment for chronic radiation proctocolitis (CRPC), reducing rectal bleeding and iron or blood transfusion requirements by cauterizing mucosal telangiectasias [5]. Tam *et al.* [6] described two patients with myelodysplastic syndromes who developed high fever, with Gram-negative organisms being found in blood cultures. Other authors reported fever after APC, unfortunately without any details of blood samples [7–9].

Despite the wide use of APC, the incidence of bacteraemia after this procedure is still unknown. We therefore carried out a prospective study to determine the frequency of bacteraemia following APC for CRPC.

Method

From September 2007 to August 2009, patients undergoing APC for bleeding CRPC were enrolled. The indications for radiotherapy were prostatic and uterine cervix cancer. All patients were treated as outpatients. Oral sodium phosphate (Fleet Phospho-Soda) was used for bowel preparation.

The argon gas flow was 1.0 l/min and the electrical power setting was 40 W, using a high-frequency generator

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(ERBE APC 300; Tübingen, Germany). The goal of treatment was to ablate all visible telangiectasias in a single session, whenever possible. Procedures were performed with a standard video colonoscope. Patients with severe comorbidity or advanced neoplastic disease were not included in the study. None of the subjects had taken antibiotics within 4 weeks or during the APC procedure. None had signs of infection (body temperature > 37°, heart rate > 90 beats/min or respiratory rate > 20 breaths/min) at the time of the procedure.

Bacteraemia was evaluated by blood culture at baseline and 30 min after the procedure. The skin site was cleaned with 70% isopropyl alcohol. Ten millilitres of blood was drawn, and BACTEC® (BD Bactec plus Aerobic/F, Becton, Dickinson and Company, 7 Loveton Circle, County Clare, Ireland) was used for blood culture. A negative result was defined as no significant growth at incubation day 7 and then no growth in the terminal subculture.

Patients were closely monitored (axillary temperature, blood pressure, heart and respiratory rate) for at least 3 h after the procedure. A telephone interview, asking for symptoms associated with infection, such as chills or sweating, was carried out 24–48 h after hospital discharge. Subjects were instructed to return or call the unit in the event of any adverse symptoms at any time.

All of the patients signed an informed consent for APC and blood culture sampling.

Results

Twenty-one [16 men; median age 68.7 (32–83) years] consecutive patients were included and 30 APC session treatments were performed. The mean number of sessions was 1.43 (range 1–4) per patient.

All blood cultures obtained at baseline were negative. Two (7%) samples obtained 30 min after the procedure showed a positive result. *Staphylococcus hominis* was isolated in a 56-year-old man. The other case, a 65-year-old man, previously treated with formalin, had a positive culture for *Streptococcus bovis* and *Rhodotorula* sp. He was submitted to another session 1 month later, and at that time, blood culture was negative. This patient had no evidence of any other colonic disease (neoplasia or polyp) beside radiation telangiectasias and scars because of formalin. Both patients had no evidence of immunodeficiency or heart disease. They were not treated with antibiotics and did not show any signs or symptoms of infection during follow up.

Major complications such as colonic perforation or explosion did not occur in this study. Some patients experienced mild postprocedure rectal pain and cramps.

Discussion

The incidence of bacteraemia after APC treatment of CRPC has not been reported. In our study, bacteraemia was found in two (7%) of 30 sessions. The study had some limitations, however. The sample size was small, and the true frequency of bacteraemia associated with APC for CRPC might be underestimated because there was a risk of missing transient bacteraemia using only one post-procedure blood culture. Furthermore, the study was not comparative. Nevertheless, a positive culture was found in only two (7%) of the 30 sessions indicating that the presence of bacteria was rare.

Staphylococcus hominis is a coagulase-negative *Staphylococcus* (CNS), and despite some reports that it can cause nosocomial bloodstream infection [10] and clinically significant infections [11], it was probably a contaminant in this study based on the fact that CNS is one of most frequent causes of contamination of blood cultures and because the patient had no clinically significant sign of infection. The other patient had two different microorganisms (a yeast and a bacterium) isolated after his first APC treatment. The first *Rhodotorula* sp., is a basidiomycetous yeast of the Sporidiobolaceae family, widespread in nature and previously considered to be nonpathogenic, although in the last two decades it has emerged as an opportunistic pathogen, particularly in immunocompromised patients [12]. This is the first report of positivity for this organism after an endoscopic procedure according to a recent systematic review [12]. The second was Streptococcus bovis, a nonenterococcal Lancefield group D streptococcus [13,14]. This organism is a normal inhabitant of the intestinal tract and may be isolated in 5–16% of faecal samples in normal adults [15]. It has been identified as a causative agent of certain serious infections, especially endocarditis [13,15]. The association between *S. bovis* bacteraemia, endocarditis and colonic neoplasia is well described [13–15]. As *S. bovis* is a normal inhabitant of the gastrointestinal tract, it is not coincidental or surprising that a sizable proportion of patients with *S. bovis* bacteraemia have concomitant bowel lesions [15]. So it is reasonable to expect at least some reports of *S. bovis* bacteraemia in patients with CRPC. However, according to our knowledge and the systematic review of Gupta *et al.* [14], this is the first case of *S. bovis* bacteraemia in a patient with chronic radiation colorretal disease.

APC is invasive treatment. The gas may cause distension of the colon with the possibility of bacterial translocation. However, it is interesting that the incidence of bacteraemia rate in our study was almost the same as that associated with colonoscopy (4.4%) [2,3].

The results of this study indicate that bacteraemia associated with APC for CRPC is low. Thus, APC for CRPC may be considered a low-risk procedure regarding infection and does not warrant prophylactic antibiotics.

Competing interests

None.

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