A case of Aspergillus fumigatus peritonitis in a patient undergoing continuous ambulatory peritoneal dialysis (CAPD): diagnostic and therapeutic challenges

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A case of Aspergillus fumigatus peritonitis in a patient undergoing continuous ambulatory peritoneal dialysis (CAPD): diagnostic and therapeutic challenges

In the June 2004 issue of your journal, Scotter described a case of aspergillus peritonitis in a patient undergoing renal dialysis diagnosed by the polymerase chain reaction and galactomannan detection.

We had a similar case of aspergillus peritonitis detected by (repeated) culture of peritoneal fluid and a positive serum galactomannan detection test.

An 82 year old man under continuous ambulatory peritoneal dialysis was referred to our Department of Chronic Disease. He developed a documented polymicrobial bacterial peritonitis, which was adequately treated. A few days later Aspergillus fumigatus was repeatedly cultured from his sputum. A bronchial aspirate also yielded this species. Because of persistent abdominal pain, peritoneal fluid was cultured using BacT/ALERT® FA aerobic and SN anaerobic culture bottles (bioMérieux, Marcy-L’Etoile, France). Cultures repeatedly yielded A. fumigatus. The dialysis catheter was removed and cultured on Sabouraud dextrose agar containing chloramphenicol. A fumigatus grew after two days of incubation. The galactomannan antigen detection test (Platelet® Aspergillus; Bio-Rad, Marnes-La-Coquette, France) performed once on the patient’s serum revealed a positive value of 3.5 (normal value, < 0.8; doubtful, 0.8–1.0; positive, > 1.0). Oral voriconazole 400 mg twice daily was started promptly because peritoneal aspergillosis was considered very likely. Unfortunately, the patient died after 24 hours of antifungal treatment.

Peritonitis caused by fungi of the Aspergillus sp is rare in patients with continuous ambulatory peritoneal dialysis and is associated with high mortality. Early detection, peritoneal catheter removal, and appropriate treatment with antifungal drugs may improve outcome. However, it is not clear whether voriconazole is the treatment of choice, because it has never been used in this setting, and there are no data available on voriconazole concentration in peritoneal fluid.

Galactomannan detection in serum and maybe also in peritoneal fluid, in addition to the polymerase chain reaction (if available), may contribute to an early diagnosis.

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References

Know the whole history

As histopathologists, we rely heavily on the clinical information provided with request forms to inform us of the patient’s current complaint and relevant medical history. This varies enormously between clinicians. We also build up a relationship with our clinicians who regularly send biopsy material. This is particularly relevant in gastrointestinal pathology—for example, in assessing the endoscopic appearance of inflammatory bowel disease and the subsequent interpretation of the histological findings. With time, we develop an understanding with the clinicians who we deal with regularly and learn to judge the accuracy of the proposed diagnosis, particularly with the more experienced endoscopists.

A 57 year old woman underwent endoscopy by an experienced gastroenterologist who noted a deep gastric ulcer and infiltrated looking duodenal cap carcinoma. The pathology data base showed that seven months previously she had a right hemicolectomy for a poorly differentiated Duke’s B adenocarcinoma of the hepatic flexure, which was infiltrating the omentum and involved the peritoneal surface of the specimen. Histological examination of the antral gastric biopsies showed abnormal glands with pronounced nuclear atypia (fig 1); the duodenal biopsies were mildly inflamed and oedematous. The gastric biopsies were considered suspicious of malignancy, particularly in view of the endoscopic appearances, and multiple repeat biopsies were suggested. Repeat endoscopy again showed an endoscopically normal duodenal cap, but this time the essential information of radiotherapy for the colonic carcinoma was given. Further enquiries from the treating oncologist indicated that the treatment field included the duodenum. At initial inspection the duodenal biopsies had a bizarre appearance with apparent underlying malignancy (fig 2); however, immunohistochemistry showed the underlying tissue to be pancreas with residual islets.

The pitfall of pancreatic tissue in the base of an ulcer is well known, although not often seen. However, our case was further complicated by the effects of radiotherapy. Radiation induced changes in the gastrointestinal tract are well described but histopathologists need to be aware when radiotherapy has been given. As such, we rely on our clinical colleagues to provide this information to us but, on occasion, even the best clinicians may fail to provide a crucial piece of information, as was the case here, which can then trap the unwary.

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References
Molecular Microbiology

The availability of molecular diagnostic methods has increased dramatically over the past 15 years. This revolution has changed the landscape of medical diagnosis and management, and continues to do so, providing a new layer of depth to our understanding of the pathogenesis of disease, along with newly identified targets for a range of pharmacological and immunological treatments. Consequently, these developments demand an appropriate level of understanding on the part of medical and other healthcare staff.

This large, hardback book is edited by a diverse and accomplished group, and covers the part of the above revolution as it broadly applies to microbiology. The first section, Diagnostic principles, reviews DNA probe technology, nucleic acid amplification, nucleic acid sequencing, molecular strain typing, and novel approaches to the detection of nucleic acid amplification products. The second section, Diagnostic applications, is an in-depth review of the use of molecular technologies to detect and characterise bacterial, viral, fungal, and parasitic pathogens. Also included are sections on pharmacogenetics and host genomics as they influence infectious disease outcomes, in addition to discussion of the crucial areas of laboratory standardisation, proficiency testing, and quality control.

Mutation detection forms a particular theme throughout the book; as would be expected, because nucleotide mutations contribute to microbial virulence; antigenic diversity of pathogens; attenuation; survival in hostile environments both in vivo and in vitro including immune evasion, antimicrobial resistance, and response to treatment; host susceptibility to and defence against infection; and the ability of the host to metabolise therapeutic antimicrobial drugs, etc. This is discussed well in the book across many different chapters. For example, several chapters are devoted to the various approaches to mutation scanning of microbes (screening methods (PCR based and non-PCR based)), DNA sequencing, phylogenetic analysis, strain typing approaches, pharmacogenetic methods of infectious disease management, and host susceptibility to microbial infection and cancer.

Single nucleotide polymorphisms (SNPs) occur throughout the human genome and the book describes their discovery through nucleotide sequencing, the various categories based on geographical location and therefore importance (coding, regulatory, intronic, and intergenic), and routine methods of detection. The presence of SNPs within various human genes has been shown to confer susceptibility, resistance, or phenotype modification to several infectious diseases, which are discussed in detail. For example, susceptibility to respiratory syncytial virus (RSV) infection (interleukin 8; IL-8), susceptibility to septic shock, cerebral malaria, mucocutaneous leishmaniasis, human papillomavirus/cervical cancer development (tumour necrosis factor α), susceptibility to a fatal outcome in meningooccal disease (IL-1b), immunodeficiency as a result of defective opsonisation (mannose binding lectin), human immunodeficiency virus 1 (HIV-1) susceptibility (CCR-5), susceptibility to intracellular pathogens such as Mycobacterium tuberculosis (N-RAMP (SLC11A1)), etc.

Various SNPs occurring within cytoplasmic psittacosis and drug transporters, such as P-glycoprotein and multi-drug resistance associated proteins, affect the metabolism of antibiotics including erythromycin, clarithromycin, primaquine, quinine, sulfonamides, isoniazid, dapsone, propionil, HIV-1 protease inhibitors, imidazoles, rifampicin, and chloramphenicol. The book describes these SNPs, the function of the genes relevant to this section, and the methods available to detect an array of such polymorphisms to maximise efficacy and reduce toxicity of antibiotics towards efficient management of infectious disease.

In conclusion, this reference book brings together a wealth of information from diverse sources towards a common theme of molecular microbiology and infectious diseases. The book is well written by experts in the various fields, contains many helpful illustrations with colour plates, and will appeal to microbiologists, pathologists, infectious disease specialists, pharmacologists, and students of these disciplines. This is a thoroughly enjoyable book to browse or read and I envisage using my copy on a regular basis.

J Kerr

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