Pseudomembranous colitis with Clostridium *difficile* during treatment by moxifloxacine (quinolone).

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C. *difficile* is the most frequently pathogenic agent isolated in colitis associated with antibiotics and pseudomembranous colitis (PMC). C. *difficile* takes advantage of the disturbance of the intestinal flora to settle.
We report a case of PMC appeared during treatment with moxifloxacine in a pulmonary infection in an emphysematous patient.
The diarrhea is generally benign, but can be severe, with toxic megacolon or even the extreme case of colic perforation.
The diagnosis is based on the research of toxins of C. *difficile* (A and/or B) in the intestinal stools or liquids (collected at the time of the endoscopic examination) to which is associated the anaerobic culture on selective agar. The reference method is the measurement of the cytotoxic effect of the B-toxin on a cell culture.
Metronidazole or vancomycine constitutes the treatment.
The prevention of relapses is very important, hygiene measures and probiotic agents must be associated to the antibiotic treatment.

Pathogenic capacity of C. *difficile* (CD) :
- Responsible for 15-25% of the clinical diarrheas post-AB.
- Signs regress in 25% of the cases after stop of the responsible AB.
- Many AB are accused especially those with large spectrum having an activity on the anaerobic flora.

Factors which facilitate *C. difficile* transmission :
- Resistance of spores.
- Antibiotic pressure in hospitalized patients.
- Promiscuity of patients.
- Unrecognized CDAD or readmission of patients with CD.

Infection → **Antibiotics** → Disturbance of intestinal flora → Diarrhea

Frequently	*Unfrequently*	*Rarely*
Ampicillin Amoxicillin Cephalosporin Clindamycin	**Quinolones** Sulfamides Tetracyclines Macrolides	Aminoglycosides Metronidazole Vancomycin

Endogenous / Exogenous → Colonisation → ***C. difficile***

Diarrhea → Associated with AB / PMC → Exams → Biological prelevements → Settles / Intestinal liquids

Other → - Echography - CT-scan (Fig. 2) - Endoscopy (Fig. 3)

Reservoirs :
- patients with CDAD (Clostridium Difficile Associated Diarrhea).
- asymptomatic carriers of CD.
- environment : persistence of spores on surfaces.

Transmission :
- oro-fecal.
- from patient to patient via hands.
- via contaminated materials.

A -Toxin → Binding on receptor of the enterocytis → Neutrophils, cytokins → Inflammation +++

B-Toxin → Receptor → Cytotoxic activity (Rho) Depolymerisation of actin filaments → Increase of permeability

Inflammation +++ / Increase of permeability → Mucosis damage Diarrhea, necrosis, PMC

Direct Exam (Fig. 1) :
- Gram + bacillus
- spore forming
- anaerobic


Fig. 1 : Direct exam.

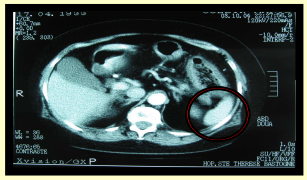
Fig. 2 : Abdominal CT-scan.


Fig. 3 : Endoscopic view of the colon.

1) ***Cultures*** :
- CDSA
- Shaedler Agar Vit K1

Advantages : high sensibility and positive with negative toxin.
Disadvantages : slow and less specific. (Fig. 4 & 5)
NB : Conservation at room temperature or congelation (-80°C) decrease cytotoxic activity → process immediately or keep at 4°C.

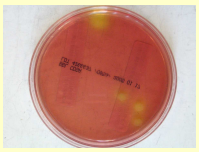
Fig. 4 : CDSA.

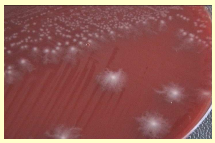
Fig. 5 : Shaedler 5%.

2) ***Galery : sugar fermentation***
ex: rapid ID 32A, API 20A

Sensitivity enhancement : sodium-taurocholate, ethanol shock, anaerobic pre-incubation.

3) ***ELISA, ELFA***
ex. : Vidas®

Advantages : fast, easy and specific.
Disadvantages : expensive and less sensible than cytotoxicity test.
ELISA, ELFA or immuno-chromatographic test detect either A-toxin alone or the A- and B-toxins by means of monoclonal or polyclonal antibodies. (Fig. 6 & 7)

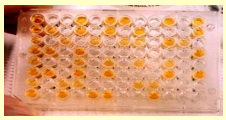
Fig. 6 : ELISA.


Fig. 8 : Individual test.

4) ***Individuals Test***

Advantage : fast, easy, excellent analytical performance
Disadvantages : expensive and less sensible than cytotoxicity test.
ex. : Triage® = example of test which detects A-toxin and the GDH (fixating of an Ab A-antitoxin and anti-GDH on a membrane → binding correspondent Ag. The immune complexes formed are revealed by addition of Ab conjugated with peroxydase and a chromogen. (Fig. 8)


Fig.7 : Vidas®.

5) ***Measurement of the cytopathic effect on cellular culture***

Advantages : the most sensible and specific.
Disadvantages : slow (18 to 48h + neutralisation), cellular culture, fresh materials and no standardisation. (Fig. 9)

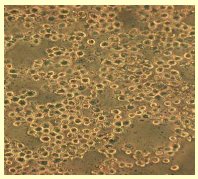
Fig. 9 : Cellular culture.

Confirmation of the diagnostic → Treatment

Stop causal AB / Vancomycin Or Metronidazole / + probiotics

Relapse prevention : association of probiotic agents (eg : Saccharomyces boulardi) with AB.
Prevention of nosocomial infections : hygiene + isolment of the patient + room decontamination.

Relapse ? → Chirurgy : colectomy (resection)

CONCLUSION :
- C. difficile is a major nosocomial pathogen.
- C. difficile transmission from patient to patient is frequent but often remains asymptomatic.
- Environment can act as a reservoir.
- Microbiological diagnosis is easy.
- Surveillance should be instituted in order to detect relapses.