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Date:

LABORATORY PROTOCOL Nr.6 – BLOODSTREAM INFECTIONS

Case report 1

ANAMNESIS: Male 70 yrs. old, prostate cancer in anamnesis, found unconscious by his wife at home

Clinical examination: body temperature (BT) 39.1 °C, puls (P) 130/min, breathing frequency (BF) 45/min. Pulmonary auscultation – left basal localisation of respiratory sounds (rales), signs of centralization of bloodstream as a impact of sepsis

Hospitalized at intensive care unit with the urgency of intubation and artificial pulmonary ventilation (APV)

Laboratory examination: CRP 210 mg/l, 13 600 leucocytes with 77% of polymorphonuclear leucocytes (PMN) and 20% of rods, O₂ saturation 70%

2 blood cultures sets were collected for microbiological examination, BAL

Second day: blood culture positive, microscopic examination **G+ cocci in pairs**

What is your suspicion?

- Identification of cultured bacteria in blood culture:
Finding the same bacteria also in BAL culture.
- ATB susceptibility testing: Disc diffusion method

Results: Penicilin – S, Erytromycin – S, Clindamycin – S, Cotrimoxazol – S, Moxifloxacin - S

Questions:

1. Which basic biochemical tests can be used for differentiation between
and alpha haemolytic streptococci colonies?

2. Which ATB is ATB of choice in this case?

3. In which risk groups of patients preventive vaccination is recommended?

4. Will you recommend vaccination against *S. pneumoniae* to this patient? Which predisposition factors were in this patient?

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Case report 2

ANAMNESIS: 24 yrs. old man returned back from India 4 weeks ago. He comes for one week lasting fever, nausea and vomiting. He complains about abdominal pain and headache. In the beginning of his disease he had diarrhoea, nowadays he suffers more likely from obstipation. He found pinkish exanthema on abdominal skin few days ago but nowadays it has already disappeared.

During the patient's stay in India he was in a close contact with the local inhabitants and ate the local food. Prior to his journey he was vaccinated against hepatitis A and B. He didn't take antimalarial prophylaxis. He comes to the doctors with her mother saying that he collapsed in the bathroom in the morning. During the examination the patient shows the signs of agitation even aggression against personnel and refuses hospitalization.

Clinical examination: BT 37.7 °C, dry mucous membranes, the patient doesn't cooperate during the examination

Laboratory examination: CRP 139 mg/l, lab signs of dehydration

Therapy: symptomatic, hydration

Sampling: 4 sets of blood cultures, rectal swab

Results: Within 24 hours all 4 blood cultures were positive. Microscopy: G-rods.

Within 48 hours of rectal swab cultivation on MacConkey agar: lactose negative colonies, *Salmonella* sp. -> suspected serotypization, performed: ***Salmonella typhi***

ATB susceptibility testing – disc diffusion method: Ampicilin – S, cefotaxim – S, ciprofloxacin – S, gentamicin – S, cotrimoxazol – S, chloramphenicol – S

Questions:

1. What is your diagnosis?
2. How important is the data about travel anamnesis and vaccination/prophylaxis?
3. What is the source of this infection?
4. The patient is employed in the food industry – what impact will this diagnosis have?
5. What is the drug of choice?
6. Is this disease preventable?
7. Which further causative agents of travellers' diarrhoea will you include in the differential diagnosis?
8. What is the relation of patient's neurologic symptoms and this infection?

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Case report 3

ANAMNESIS: Female patient of 55 yrs. originally admitted to hospital with acute pancreatitis with the necessity of several surgeries has been hospitalized at intensive care unit in a serious condition with the necessity of intubation and APV already for 14 days, she is stable in blood circulation, CRP decreasing. In lower respiratory track (LRT) detected colonization with multiresistent strain of *Pseudomonas aeruginosa*. Since admission she has got central venous catheter (CVC) inserted into *v. subclavia*, that is taken care of regularly.

Immediate worsening of her condition occurred during the weekend duty on the 14th day of hospitalization, fever with the shivers, blood circulation instability with the signs of sepsis and necessity of noradrenalin support.

The doctor on duty examined the patient carefully and found reddening in the surrounding of central venous catheter.

Questions:

1. What should he do further on?
2. Which specimens should be collected?

Microbiological examination: Positive blood cultures, microscopy examination - G- rods
Pseudomonas aeruginosa - ATB susceptibility: Piperacilin/tazobactam – R, ceftazidim – R,
meropenem – R, colistin – S, amikacin – S, gentamicin – S, ciprofloxacin - R
Central venous catheter cultivation: the same strain detected and identified

3. What is the definition of the terms sepsis and SIRS?
4. What is the definition of the term nosocomial infection ?
5. Which nosocomial infections are the most frequent?
6. Which pathogens are the most frequent causative agents of nosocomial infections?
7. Which ATB will you choose in this very serious outcome of infection caused by the isolated bacteria?
8. In case that the catheter can't be removed and sent for cultivation how could the catheter sepsis be proved and confirmed?

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Case report 4

ANAMNESIS: 19 yrs. old woman has suffered from UTI in previous 4 months, repeatedly treated p.o. with ampicillin. Now she comes to emergency for worsening her symptoms. She has got nausea for last 5 days, no vomiting but since yesterday evening she has got strong pain in left lumbar area, fever with shivers and chills. She noticed smell of urine.

Clinical examination: BT 38 °C, blunt pain in left lumbar area, tapotement positive on left side.

Laboratory examination:

Biochemical examination of urine: leucocyturia, bacteriuria, increase of CRP.

Ultrasonic examination of kidney: abnormal parenchymal echogenicity

Questions:

1. What is your diagnosis?
2. Which specimens for microbiological examinations will be sent?

Positive blood culture microscopy: G- rods

Urine culture: Blood agar – flat colonies with zone of beta hemolysis of quantity 10^6

MacConkey agar – pink lactose fermenting colonies of quantity 10^6

3. What is your suspicion?

ATB susceptibility testing by disc diffusion method: nitrofurantoin – S, trimethoprim/sulfonamid – S, ampicillin – R, ciprofloxacin – R, amoxicillin/clavulanic – S, gentamicin – S, piperacilin/tazobaktam – S, meropenem – S, cefotaxim – S

4. Isolated bacterial strain was resistant to ampicillin. Which anamnesis data can explain this fact?

5. Was ampicillin treatment chosen correctly?

6. Do you consider determined *E.coli* quantity in urine significant?

7. Which further complications excluded urosepsis may result from pyelonephritis?

8. What are the risk factors for pyelonephritis development?

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Case report 5

ANAMNESIS: 73 yrs. old woman followed-up for mitral valve defect that is a result of rheumatic fever passed in her childhood. She describes nonspecific problems lasting already for several weeks – she feels tiredness, is losing weight, sweats a lot at night. She visited GP because of intermittent subfebrile temperature two weeks ago. GP excluded UTI and indicated azitromycin because of suspicion of respiratory infection, then she felt better for few days. Last week dyspnoea occurred and the fever increased. She again visited her GP who sent her to the cardiologic examination. Because of the cardiologist's suspicion he sent the patient to the hospital and for verification of findings.

Clinical examination: BT 36.7 °C, splinter haematomas on the hands, petechial rash on conjunctiva.

Sampling for culture: sputum, urine, 3 sets of blood culture

Oesophagus echocardiography: Vegetations on mitral valve.

What about your diagnosis?

Laboratory examinations:

Blood culture positive within 48 hours, microscopy: **G+ cocci in chains**

Cultivation: viridans streptococcus.

Therapy: Penicillin G, in the beginning in combination with gentamicin

Question:

1. What risk factor for IE was in the patient anamnesis?

2. Which further risk factors do you know?

3. What is the typical course of IE in i.v. drug addicts?

What is the typical causative agent in this group of persons?

4. Which further pathogens are the typical cause of IE?

5. Which are the extracardial complications of IE?

6. Does any prophylaxis exist? Which patients is it reserved for?