Serratia Marcescens Meningitis Following Spinal Anaesthesia and Arthroscopy

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We present case of nosocomial bacterial meningitis, caused by Serratia marcescens (ESBL), occurred following spinal anaesthesia. Although very rare bacterial meningitis is serious complication of spinal anaesthesia and early diagnosis as well as effective treatment is extremely important. Previously healthy individual, admitted to Orthopaedic Department for routine arthroscopy, approximately within 24 hours after operation was performed complained of headache and fever. Infectious Diseases physician was consulted, lumbar puncture was performed and purulent meningitis was confirmed. Cerebrospinal fluid and blood cultures of patient confirmed Serratia marcescens (ESBL), resistant pathogen and important nosocomial agent. Patient was successfully treated. Cases of spinal meningitis caused by Serratia marcescens are rare. Local resistance pattern is important and should be always considered when starting therapy. Infection control team was appointed because of similar case of meningitis one month before in the same Department, and after investigation discovered Serratia in anaesthetic vial used in procedures. New measures and recommendations regarding infection control were implemented at Orthopaedic Department. Meningitis as a complication should always be considered as a possible differential diagnosis with patients after spinal anaesthesia complaining on headache and fever. Early diagnosis and early treatment is extremely important. Knowledge and practice of infection control measures is mandatory and should be always emphasized to performing staff. Key words: Serratia marcescens, meningitis, spinal anaesthesia.

1. INTRODUCTION

In recent years incidence of iatrogenic bacterial meningitis is increasing although it can be considered that these complications are underreported and are based mainly on case reports (1, 2). Since bacterial meningitis is a serious and very rare complication of spinal anaesthesia and can result in fatal outcome (3, 4) it is of vital importance knowledge about prevention as well as manifestation of this complication. Meningitis can be found after lumbar puncture in approximately 1 in 50000 patients (2), although literature date can vary in different studies (5). Leading pathogens listed as causative agents of meningitis related to spinal anaesthesia are low virulence viridans streptococci (4), it is however important to remember that these pathogens are becoming more resistant (4) especially in USA. Mechanism of developing bacterial meningitis after spinal anaesthesia can be either haematogenous disseminating, although this is very rare, lack of personal infection control measures, and contamination of drugs and equipment. In our case we present case of bacterial meningitis caused by Serratia marcescens (ESBL) confirmed by culture in cerebrospinal fluid and blood. This Gram-negative bacterium is opportunistic pathogen and colonizer of human gastrointestinal tract, member of Enterobacteriaceae family and Serratia genus it is capable of causing wide variety of infections and represents one of major causes of nosocomial infections (6). Serratia marcescens is very rare etiological agent in meningitis related to spinal procedures and we found one report in literature (7). In this case beside clinical characteristics we also wanted to emphasize awareness about this complication among medical personnel as well as infection control measures.
2. CASE REPORT.
A 20-years old previously healthy man was admitted to Orthopaedic Clinic for routine scheduled arthroscopy due to meniscus injury prior three months. According to medical history patient was healthy student, active sportsman, there was no data about allergies, no earlier hospitalisations, properly immunized, non-smoker. After performing spinal anaesthesia by anaesthesiologist of this Department, arthroscopy was performed with resection. Approximately within 48 hours after operation was performed patient complained of headache, and fever was registered as well by nursing staff. At first therapy with cefazolin was instituted by surgeon.

There was no improvement, fever and headache continued. Following day Infectious Diseases physician was consulted. On examination patient was febrile, alert, oriented and cooperative, the blood pressure was 110/60 mmHg, heart rate 90 per minute, and there was neck stiffness as well as positive Kernig’s sign.

After examination lumbar puncture was performed with following results: cerebrospinal liquor was milky, with 7082 cells, predominantly neutrophils, glucose level 0.3 mmol/l (blood glucose 15.0) proteins 2.8 g/l and chlorides 120 mmol/l. Laboratory findings showed elevated CRP 57.7 mg/l, ESR 20, leukocytosis 16.7×10⁹/l with neutrophils predomination, and hypokaliemia 3.2 mmol. Other laboratory findings were in referent range value. Diagnosis of purulent meningitis was confirmed and further treatment was performed at Clinic for Infectious Diseases. After microbiological samples were taken treatment was started with combined therapy of vancomycin 2 grams b.i.d. intravenously and meropenem 2 grams t.i.d. Meanwhile cerebrospinal fluid and blood cultures of patient grown Serratia marcescens (ESBL), important nosocomial agent in our setting. Antimicrobial therapy was corrected and therapy with meropenem continued for 21 day in total. Patient was successfully treated.

3. DISCUSSION
Complication after performing any kind of invasive procedure is something that always enforces us to stop and reconsider all the facts about procedure and to try to give answer where the things went wrong. Meningitis related to spinal anaesthesia is problem that is not so frequently encountered although in past years several research were conducted analysing not only sporadic case reports published in literature but the infection control measures and recommendations related to invasive procedures. Incidence of postspinal meningitis is something that varies in literature, i.e. from 1/19.064 found by Videira et al. (8) to 1/50.000 by Van der Beek (2) and 7/1.000.000 by Arooma et al. (9). However precise data are difficult to obtain and surely surveillance in the future could give answer to this. Although this complication can end up fatally, the outcome is usually successful and with low rate of sequels. In this case report patient’s symptoms started approximately within 48 hours, similar reports we found in research published by other authors. It is important to mention that one month prior to this case another spinal meningitis happened at same Department. Therefore, Infection Control Team was appointed and investigation was carried out. Infection in this case could have been caused by three possible mechanisms. Firstly by haematogenous dissemination, since the patient was previously healthy this option was soon dismissed. Another possibility was that that pathogen could have been introduced through the spinal needle. Third option was mistake related to infection control measures, either contamination of equipment or avoidance of protective means and possible migration of mouth pathogens from medical staff. Samples were taken from medical staff, and also samples were taken from equipment and anaesthetic used in procedure. Regarding therapy choice, since this procedure happened in Department were resistant pathogens were earlier identified although respecting literature data about most common pathogens we started with potent therapy of vancomycin and meropenem. Blood cultures as well as liquor culture of ESBL Serratia confirmed good treatment choice. Positive result of S. marcescens came from multidose vial of anaesthetic used during the procedure. It is very important finding, especially because in available literature we can find similar cases (7) as well as recommendation that use of multi-dose vials is constant threat, and separate vials should be used (4). As a result enhanced Infection control measures were implemented as well as recommendation for use of single vials. Meningitis is a serious complication of spinal anaesthesia and early diagnosis and adequate early treatment is extremely important. Meningitis should always be considered as a possible differential diagnosis with patients after spinal anaesthesia complaining on headache and fever, or with patients with consciousness alteration. Knowledge and practice of infection control measures is mandatory and should be always emphasized to staff. Separate vials of medicines should be used for patients and approach to procedure should be with all aseptic precautions.

REFERENCES