Meningitis post-spinal anaesthesia: A report of two cases

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INTRODUCTION

Iatrogenic meningitis post-spinal anaesthesia is considered rare but is essentially a grave complication. The incidence of infectious complication post central neuraxial blockade ranges from 0% to 0.04% [1,2]. This complication can occur not only during spinal anaesthesia but also after precautions, haematogenous spread when bacteremia is present and lumbar puncture. CSF study revealed white blood cell (WBC) diagnostic lumbar puncture, epidural analgesia/anesthesia, myelography post-central neuraxial blockade ranges from 0% to 0.04% [1,2]. This

A 48-years-old lady was posted for ureteroscopy (Left) for a 7 mm stone in the left proximal ureter. She was on treatment for Schizophrenia for past 8 years (Tab Clozapine 25 mg HS) and accepted in American Society of Anesthesiologist physical grade (ASA) II. In operation theatre (OT) after attaching regular monitoring (Heart rate, non-invasive blood pressure, electrocardiography, pulse oximetry) she received a sub arachnoid (SA) block with 12.5 mg bupivacaine in lateral position in lumbar interspace 3-4 with help of 26 G Quinckes’ needle. Standard strict aseptic precautions which included wearing cap, face mask, sterile gown, sterile hand gloves, cleansing agent to prepare the skin (2% povidone iodine and alcohol) and sterile drape were followed stringently. The intraoperative period was uneventful though pus was encountered around the calculus during extraction. Around five hours postoperatively, patient developed altered sensorium and had one episode of vomiting. On neurological exam conducted at one week was essentially normal and thereafter patient was discharged.

CASE REPORT 2

A 35-years-old male patient, case of Anterior Cruciate Ligament tear Left leg was posted for Arthroscopic repair. Patient was accepted in ASA I. In OT regular monitoring: HR, NIBP, ECG, SpO2 was attached and he received a SA block with 12.5 mg bupivacaine in lateral position in lumbar interspace 3-4 with help of 26 G Quinckes’ needle. Standard strict aseptic precautions which included wearing cap, face mask, sterile gown, sterile hand gloves, cleansing agent to prepare the skin (2% povidone iodine and alcohol) and sterile drape were followed strictly.

Intraoperative period was uneventful though pus was encountered around the calculus during extraction. Around five hours postoperatively, patient developed altered sensorium and had one episode of vomiting. On examination she was afebrile, GCS was E4V3M5, heart rate (HR) was 96/ min, non-invasive blood pressure (NIBP) was 144/96 mmHg and pulse oximetry reading (SpO2) of 100% on room air. No neck rigidity was noted, and no signs of meningism were present. Central Nervous Systemic (CNS) and rest systemic examination examination was normal. Computed tomography (CT) scan for head revealed no abnormalities and fundoscopy also did not show any sign of papilledema. A diagnostic spinal puncture under all aseptic precautions was executed which revealed cloudy cerebrospinal fluid (CSF). CSF study revealed white blood cell (WBC) count of 2,200/cu mm, with predominant polymorphonuclear leukocytes, protein value of 290 mg% and glucose value of 90 mg%. Gram stain of the CSF demonstrated no organisms and culture of the CSF was negative. A simultaneous total leucocyte count (TLC) revealed 19,100/mm3 with 94% polymorphonuclear leukocytes and serum blood glucose of 95 mg%.

Physician referral was sought, patient was diagnosed as a case of aseptic meningitis and started on antibiotics (ceftriaxone 1 g intravenously (IV) 12 hourly×7Vancomycin 1 g IV 12 hourly). Patient improved drastically within 24 h and became asymptomatic at 72 h however the antibiotics were given for seven days. Since the drug and spinal needle used for patient were single use so we sent sterile drug from the same batch as was used previously for the patient, sterile spinal needle from the same batch as was used in the patient, cleansing agent for microbiological investigation (culture) and no evidence of micro-organism growth was seen. A neurological exam conducted at one week was essentially normal and thereafter patient was discharged.

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previous case, the drug and spinal needle used for patient were single use and so not available for microbiological examination, we sent sterile drug and the sterile spinal needle from the same batch as was used previously for the patient, as well as cleansing agent for microbiological investigation (culture) and this time evidence of micro-organism growth was seen with the drug.

Patient improved with the antibiotics and was extubated the second day. Intravenous antibiotics were continued for seven days, patient was discharged with nil neurological sequelae.

**DISCUSSION**

Iatrogenic meningitis is an acute infection due to introduction of offending agent in the subarachnoid space. The possible causes are breach in sterility and aseptic techniques while spinal anesthesia is being administered, hematogenous spread in septicemic patients or in patients with asymptomatic bacteremia due to microscopic bleeding while spinal anesthesia is administered or due to contaminant being present in the drug utilized or the equipment used [7,8,10]. Contamination may take place from scrubbing and cleansing solutions, surgical glove powder or from the spinal needle or from the drug which is injected intrathecally during the procedure of spinal anesthesia. Sometimes systemic administration of drugs like NSAIDs, H2 blockers, trimethoprim, and sulfadiazine may also lead to aseptic meningitis like symptoms [7-9].

Commensals of oral cavity and respiratory tract (Strains of *Streptococcus*) may be the causative organisms which are of low virulence but multiply rapidly in CSF leading to bacterial meningitis in seven to 24 h [11]. Droplet infection from the health workers, doctors, or the patient may lead to contamination of the spinal needle on an incompletely sterilized patient’s skin [11]. Frequently clustering of cases is seen by a single anesthesiologist. To localize the exact source of contamination, isolates from nasopharyngeal swabs of patients as well as health care workers need to be compared with patients CSF picture. Thus following personal protective measures like a tight fitting mask covering nose and mouth is essential while performing the spinal anesthesia. The scrubbing by the health care worker should be fastidious and preparation of patient’s skin needs to be with stringent aseptic measures [12].

Meningitis is a differential diagnosis for altered sensorium, convulsions, headache, and neck rigidity [13]. Our both patients presented with altered sensorium within 5 h to 6 h post administration of spinal anesthesia. The batch of the spinal drug (Bupivacaine hyperbaric) utilized was same whereas two different anesthesiologists had given spinal anesthesia in two different OTs and there was a gap of two months between the two cases. The protocol for maintenance of asepsis is followed rigorously in our OTs.

The suspicion for meningitis led to CSF examination, CT head and fundoscopy. First patient had no positive growth on culture or gram staining while the second patient had gram staining (Gram negative coccobacilli) results. The microscopic examination of the sterile drug sent after the second case happened revealed some gram staining growth and hence the source was localized. The batch of the drug which was sent for microbiological examination was removed from the OT stocks. We notified the drug company to withdraw all the drugs of the same batch from market and also notified the Food and drug administration regarding the complication with the batch of the drug (Hyperbaric bupivacaine).

The empirical antibiotics were started as suggested by the Neuro-physician and both patients displayed drastic improvements post administration of antibiotics. The CSF picture revealed raised proteins and presence of cells but did not show any decrease in glucose and could also be pointing towards aseptic meningitis due to chemical contamination of CSF. CSF glucose concentrations less than 40 mg% are abnormal and point towards bacterial, tubercular or fungal meningitis while in viral meningitis the CSF glucose does not decrease. Aseptic meningitis is characterized by fever, nuchal rigidity and photophobia and is a neurological complication which presents within 24 h after spinal anesthesia. Microscopic examination of CSF is characterized by polymorphonuclear leukocytosis whereas CSF cultures are negative.

The second patient’s CSF did show evidence of Gram negative coccobacilli on culture and hence we diagnosed both cases as meningitis post-spinal anesthesia. Turbid CSF but no growth on culture could also be due to preceding administration of antibiotics or due to viral etiology or aseptic meningitis.

Every patient presenting with post spinal anesthesia meningitis needs to be seen in totality considering the factors like technique, equipment, drug and patient factors. We suspected infection due to cleansing agent, drug or equipment contamination as there were no clustering of cases with single anesthesiologist or single OT and institution of maximum sterility precautions was ascertained in both the cases.

Microbiological culture of drug was positive for micro-organism growth in the second case and it led to removing that particular batch from the OT stocks and notifying the agencies involved. There were no further cases of meningitis reported, thereafter. To conclude iatrogenic meningitis is rare but a grave complication and high index of suspicion can lead to early diagnosis thereby preventing mortality by administration of appropriate treatment.

**REFERENCES**
