CASE REPORT

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Bacterial Meningitis Following Spinal Anaesthesia for Caesarean Section: Rare but nearly catastrophic

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ABSTRACT

Bacterial meningitis is a disease with a potentially catastrophic outcome requiring immediate diagnosis and intervention. Bacteria can use several routes for migration into the intrathecal space. Lumbar puncture circumvents the normal central nervous system defence barrier and thus carries the potential for infection to be spread to the meninges. In sporadic cases, meningitis can occur, albeit very serious despite the meticulous aseptic techniques. Hence, meningitis finds an important place in the differential diagnosis of post-spinal headache in patients with complaints of intense headaches, fever, sensitivity to light, incoherent behaviour or muscular rigidity in the absence of any psychological disease in the postoperative or postpartum period. It is also mandated to rule out other vital conditions in the postpartum like pre-eclampsia, which can also have similar manifestations requiring urgent intervention. Adequate care given at the right time can halt disease progression, thereby limiting the damage caused, which often at times could be irreversible. The gravity of the disease should not be undermined in any scenario. Sharp and timely diagnosis is the key to prevent any adversity. Here we have documented a case of meningitis caused by the unpremeditated introduction of bacteria following spinal anaesthesia for Caesarean section and its subsequent management.

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INTRODUCTION

The inflammation of the membranes demarcating the brain and spinal cord is meningitis, thereby giving the disease its name: ”meningitis.”

Meningitis from a lumbar puncture and spinal anaesthesia as causative factors is quite rare with potentially serious side effects & complications, including death if left untreated (Burke and Wildsmith, 1997). Many scenarios, including spinal anaesthesia, lumbar puncture, epidural placement, or any intervention in the spinal canal can be an etiological factor. The two potential pathways which can cause bacterial invasion or access to cerebrospinal fluid include- any failure of the aseptic process that might externally introduce bacteria into the

cerebrospinal fluid and bacterial migration from the bloodstream with access to the subarachnoid space Tunkel *et al.* (2004). Another entity which requires a segregate description is aseptic meningitis. It is inflammation of the meninges without any tractable bacterial pathology. Common causes include viral origin by Enterovirus, varicella-zoster virus, herpes, HIV and mumps. The side effect of certain drugs like NSAIDS, antibiotics or antiepileptics, which can cause meningeal discomfort is also a notable cause (Fijter *et al.*, 2010). Mycobacteria, fungi, spirochetes are also among other causes leading to aseptic meningitis. It may be difficult to distinguish bacterial meningitis from aseptic meningitis due to the antibiotic coverage provided preoperatively (Cascio and Heath, 1996). The purpose of this paper is to discuss a case of post-spinal anaesthesia bacterial meningitis with curative treatment via antibiotic therapy.

Case Report

A 23-year-old lady, on day one of her postpartum period, was referred to us from a private hospital where she underwent caesarean section. Four hours post caesarean section, and she developed uncontrollable shivering, severe headache, confusion with incoherent speech for which she was advised further management at a tertiary institute.

Involuntary and uncoordinated movements of both hands and legs were present. Neck stiffness was noted.

There was also one episode of a generalised tonic-clonic seizure lasting 45 seconds. Her previous medical background and an antenatal record were unexceptional.

An electroencephalogram (EEG) showed a normal study.

A Magnetic resonance imaging (MRI) of her brain demonstrated hyperintensities in her bilateral frontoparietal sulcal spaces and frontal region- possible exudate of meningitis. Mild diffuse cerebral oedema was also seen, as shown in Figure 1.

Diagnostic lumbar puncture revealed an opening pressure of 25 cm H20, a turbid presence of cerebrospinal fluid. A white blood cell count of 4224 cells/mm3, DLC- Polymorphs= 90%,Lymphocytes=10% and plenty of RBC's. Cerebrospinal fluid glucose was 48 mg/dL was seen. The protein content of cerebrospinal fluid was raised at 657 mg/dL. Cerebrospinal Fluid LDH- 174 gm/dL.

Growth of *Acinetobacter species* was seen on CSF culture (Table 1).

After 48 hours of incubation, her blood culture was negative.

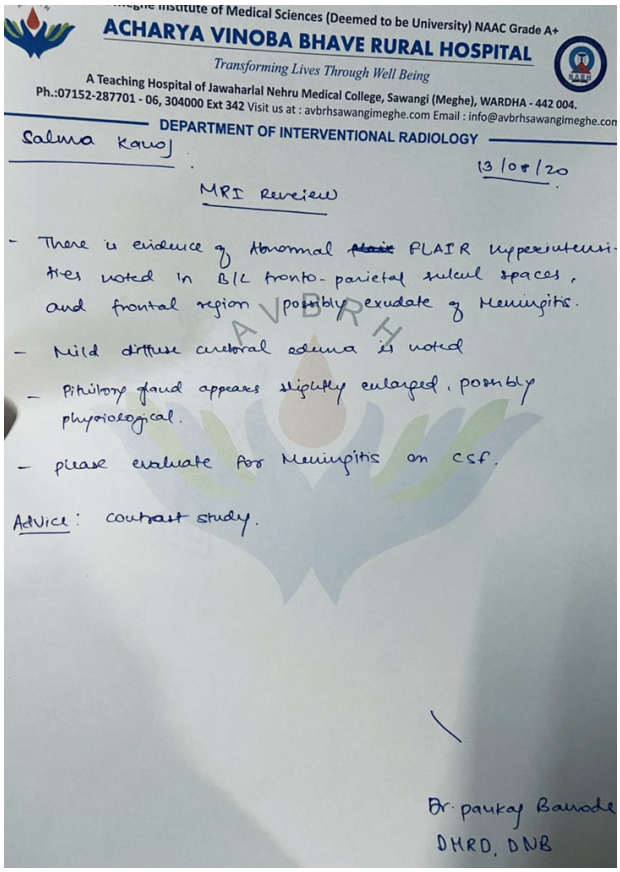

Figure 1: Magnetic Resonance Imaging Brain for our patient.

Figure 2: Macroscopic Picture of Cerebrospinal Fluid

Table 1: Laboratory Results

Parameters	Results	Units	Normal range
White Cell Count	30200	Cumm	4500 - 11000
Haemoglobin	11.6	gm/dL	12.5-15.5
Platelet	1.13	lakh/cumm	1.50 – 4.00
Alanine Transaminase	23	U/L	Less than 40
Urea	2.3	mmol/L	2.8 - 7.8
Sodium	145	mmol/L	135 - 148
Potassium	3.9	mmol/L	3.5 - 5.1
Creatinine	60	mmol/L	61 - 124
ESR	70	mm/hr	Less than 10.0
Blood Cultures	Negative		
CSF WBC	4224	cells/mm3	0-5
CSF Glucose	4.8	mmol/L	50-80
CSF Protein	657	mg/dL	15-45
CSF Culture	Positive- Acinetobacter species.		

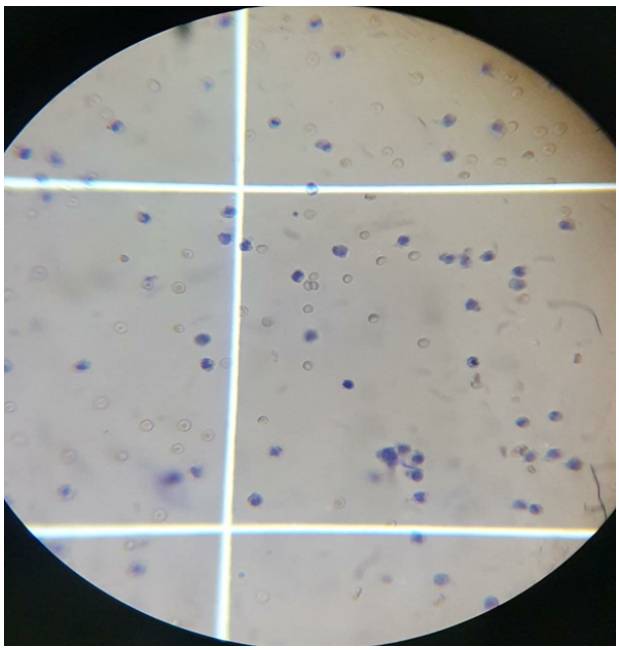

Figure 3: Microscopic Picture of Cerebrospinal Fluid

Post spinal bacterial meningitis was diagnosed in corroboration with the clinical findings.

She was started on intravenous antibiotics for two weeks—a combination of Injection Vancomycin 1gm BD, Injection Ceftriaxone 2gm BD & Injection Ampicillin 500mg QID. Injection Dexamethasone was added to reduce cerebral inflammation. The symptoms were controlled after 48 hours of intravenous antibiotics. She's made a full recovery and was sent home with no neurological deficits.

DISCUSSION

Bacterial meningitis is an acute infection of the subarachnoid space, which can cause life-threatening alterations (Lee and Parry, 1991).

Probable pathogenesis of post-spinal meningitis can involve a breach in the sterile procedure contributing to direct uptake of bacteria. Hematogenous dissemination from bleeding during spinal anaesthesia in a septic patient can also be implicated. Primary infection of anaesthetic drugs and equipment should also be ruled out (Harding *et al.*, 1994).

Each case involves close consideration of all etiological variables present like the machinery, medications and techniques. Present-day packaging and sterile methods have practically removed these problems from the forefield. A high index of suspicion is required for early diagnosis, especially to rule out other necessary conditions like pre-eclampsia. Early awareness of post-spinal anaesthesia meningitis is crucial to controlling and limiting the extent of injury to these patients.

Meningitis can be a differential in a post-spinal injury. Severe headache, epilepsy and neurological deficiency are some common clinical signs and symptoms that should point towards the inclusion of meningitis as a probable diagnosis (Goldman and Sanford, 1960).

Early interventions like blood culture and lumbar puncture should be sent in time. Treatment should be immediate and not postponed in wait for the results. Brain computed tomography is required before lumbar puncture, especially for

patients who are immunocompromised, displaying new-onset symptoms of convulsion, any signs and symptoms indicating elevated intracranial pressure or any neurological deficit (Bert and Laasberg, 1985).

One can initiate empirical intravenous antibiotics, and Antibiotic therapy should be tailored according to culture and sensitivity study (Austin, 1968).

A multidisciplinary management team, including the Physician, Neuro-physician and obstetrician, was involved in the treatment of our patient.

In this case, we suspected bacterial meningitis based on clinical appearance (Figure 2) and positive counts of cells in the cerebrospinal fluid (Figure 3). The CSF culture came positive for *Acinetobacter species.* For which sensitive antibiotics were started with immediate effect.

In an intensive care unit, rigorous management for sepsis and neurological problems was done.

In the current times, as the incidence of caesarean section has risen, every possible precaution should be taken to prevent infections, including wearing masks, excluding any pre-existing septic foci in obstetric and peripartum patients and strict asepsis maintenance.

For our patient, her health condition improved, and she was released after her antibiotic dosage was finished.

CONCLUSIONS

Meningitis-complicated spinal anaesthesia is rare. Doctors must be very critical & highly vigilant in identifying meningitis in patients with post-operative headaches, pyrexia and symptoms of meningism. The mortality rate is high, but early diagnosis and prompt treatment can evade the adverse outcome. We must also bear in mind other conditions complicating prepartum period like pre-eclampsia, and excluding them for a differential diagnosis.

Conflict of Interest

The authors declare that they have no conflict of interest for this study.

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REFERENCES

Austin, D. A. 1968. Postlumbar puncture chemical meningitis. *NY J Med*, 68:2444–2446.

Bert, A. A., Laasberg, L. H. 1985. Aseptic Meningitis Following Spinal Anesthesia—A Complication of the Past? *Anesthesiology: The Journal of the American Society of Anesthesiologists*, 62(5):674–676.

Burke, D., Wildsmith, J. A. 1997. Meningitis after spinal anaesthesia. *British Journal of Anaesthesia*, 78(6):635–636.

Cascio, M., Heath, G. 1996. Meningitis following a combined spinalepidural technique in a labouring term parturient. *Canadian Journal of Anaesthesia*, 43(4):399–402.

Fijter, S. D., Diorio, M., Carmean, J., Schaffzin, J., Quinn, M., Musser, K., Kallen, A. 2010. Bacterial meningitis after intrapartum spinal anesthesia-New York and Ohio, 2008-2009. *Morbidity and Mortality Weekly Report*, 59(3):65–69.

Goldman, W. W., Sanford, J. P. 1960. An “epidemic” of chemical meningitis. *The American Journal of Medicine*, 29(1):94–101.

Harding, S. A., Collis, R. E., Morgan, B. M. 1994. Meningitis after combined spinal-extradural anaesthesia in obstetrics. *British Journal of Anaesthesia*, 73(4):545–547.

Lee, J. J., Parry, H. 1991. Bacterial meningitis following spinal anaesthesia for caesarean section. *British Journal of Anaesthesia*, 66(3):383–386.

Tunkel, A. R., Hartman, B. J., Kaplan, S. L., Kaufman, B. A., Roos, K. L., Scheld, W. M., Whitley, R. J. 2004. Practice Guidelines for the Management of Bacterial Meningitis. *Clinical Infectious Diseases*, 39(9):1267–1284.