



Original Article (BRAIN)

Results of Conservative Management of CSF Rhinorrhea in Post Traumatic Patients

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ABSTRACT

Objectives: We aimed to see the results of conservative management of CSF rhinorrhea in post-traumatic patients.

Material and Methods: An observational study was conducted on 50 patients for 3 months from 1st November 2021 to 31th Jan 2022. Patients presented to neurosurgery unit II, PINS. All patients had a history of road traffic accidents (RTA).

Results: The age range was 10 – 50 years. The mean age was 25 years. All patients were managed conservatively for one week. We advised complete bed rest to all patients for 2 weeks. Head ends of all patients were slightly inclined from 15 – 30 degrees to reduce pressure in basal cisterns. We gave acetazolamide, mannitol, antibiotics, and anti-epileptic medication to all patients. CSF rhinorrhea in our 43 (86%) patients was stopped completely. In our 5 (10%) patients, CSF rhinorrhea was cured completely after doing a lumbar puncture with drainage of CSF and with the placement of a lumbar drain at a rate of 10 ml per hour. In our 2 (4%) patients, CSF rhinorrhea was not cured. We have to do surgery either by trans cranial or endoscopic repair of CSF rhinorrhea.

Conclusion: CSF rhinorrhea is best cured by conservative management except in 4% of cases.

Keywords: CSF Rhinorrhea, Lumbar Drain, Trans Cranial or Endoscopic Repair.

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INTRODUCTION

CSF rhinorrhea can cause meningitis in 10 percent of cases per year. There are many causes of CSF rhinorrhea. It can be caused by trauma to the skull base, osteomyelitis, congenital anomalies, and destructive lesions. CSF rhinorrhea can occur through a defect in a cribriform plate or ethmoid sinus and posterior wall of frontal sinus to nasolacrimal duct. It can also occur in middle cranial fossa fractures via sphenoid sinus or

Eustachian tube. Severe head and neck trauma cause skull base fractures and CSF rhinorrhea. Spinal fluid leakage from the nose can lead to fulminant meningitis.¹⁻³

CT with or without intrathecal contrast is used to localize the site of the leak. There is no need to do CT cisternography and radionuclide cisternography when clinical and imaging findings are matched.⁴⁻⁷

Beta-2 transferrin is found in the CSF but not present in the blood, nasal mucus, or tears. Detection of glucose in CSF in nasal and ear discharge is used to confirm the presence of CSF.⁸⁻¹² Most cases of CSF rhinorrhea resolve within a week. Surgical closure of leaks or defects at the skull base should be done to prevent leaks so that delayed bacterial meningitis may not occur.¹³ Medical management consists of one week trial of bed rest with the head of the bed elevated at approximately 15 – 30° to reduce the CSF pressure at the basal cisterns. Patients having CSF rhinorrhea must avoid coughing, sneezing, nose-blowing, constipation, and heavy lifting. Prophylactic antibiotics may be given to patients.¹⁴⁻¹⁶ We can place a subarachnoid lumbar drain for continuous drainage of approximately 5 – 10 mL of CSF per hour.¹⁷⁻¹⁹

MATERIAL AND METHODS

Study Design

An observational study was conducted on 50 patients for 3 months from 1st November 2021 to 31st Jan. 2022 at Punjab Institute of Neuroscience (PINS), Lahore.

Inclusion Criteria

Patients having a history of trauma, age range 10 – 50 years, GCS above 13/15, and patients having co-morbidities were included in the study.

Exclusion Criteria

Patients having GCS below 13/15, ages above 50

years and less than 10 years, and patients having spontaneous CSF rhinorrhea were excluded from the study.

Data Collection and Analysis

Patients' data were entered on preformed Performa for collection. SPSS version 22 was used for data analysis.

Management Technique

In 50 patients, we did conservative management of the CSF rhinorrhea for 2 weeks to see that either it is resolved by conservative management or not. We included only post-traumatic patients. We used lumbar puncture and lumbar drainage to help resolve the CSF rhinorrhea in those cases which are not resolved by mannitol, acetazolamide, etc.

RESULTS

Age Incidence

The age range was 10 – 50 years and the mean was 30 years.

Gender Incidence

In our study, 30 (60%) patients were male while 20 (40%) patients were females.

Outcome and Complications

A good outcome was observed in 86% of patients. Complications were reported in 10% of cases (Table 1). Meningitis was reported in 6% of cases, headache in 2% of cases, and seizures occurred in 2% of cases (Table 2).

Table 1: Outcome of management.

Outcome	No. of Patients	Percentage
Good	43	86
Complications	5	10
No improvement	2	4

Table 2: Complications of CSF Rhinorrhea.

Complications	Percentage
Meningitis	6
Headache	2
Seizures	2

DISCUSSION

Our patients were in the range of 10 – 50 years and with a mean age of 30 years. In our study, 30 (60%) patients were male and 20 (40%) patients were female. All patients had CSF rhinorrhea regardless of etiology.

We planned for conservative management of all patients. For the first week, we did head elevation gradually from 15 – 30 degrees to reduce pressure in basal cisterns. We gave ceftriaxone, amoxicillin, metronidazole and acetazolamide to all (100%) patients. Our 5(10%) patients had pneumocephalus. In these patients, we improved hydration status, gave antibiotics, and antiepileptic drugs, and gave oxygen for 2 days. Our 3 (6%) had wounds over the skull on presentation after a road traffic accident. We did the cleaning, debridement, and then antiseptic dressing of the wound until the wound heals. We gave mannitol to our 45 (90%) patients on presentation.

Our patients had diabetes mellitus, hypertension, chronic kidney disease, ischemic heart disease, etc. Our patients had a history of altered state of consciousness, multiple episodes of vomiting, fits, and headaches.

In the second week, in those patients who were not improved after conservative management, we did a lumbar puncture for CSF drainage and also placed a lumbar drain. In 4 (8%) patients we placed a lumbar drain and in 1 (2%) patient we did a lumbar puncture and drained CSF. After doing these management measures, 2 (4%) patients did not cure. In these patients, we performed a CT scan with FESS protocol and an MRI brain with CSF rhinorrhea protocol. These 2 (4%) patients were prepared for

surgery either by transcranial or endoscopic approach.

All patients' baseline and bleeding profiles were monitored. In all patients, CT brain plain was performed before the operation. In all patients, comorbidities were dealt with after consulting with the medical department.

In our study, the main complications were headaches, meningitis, and seizures. Meningitis occurred in 3 (6%) patients. Seizures occurred in 1 (2%) patient. Headache occurred in 1 (2%) patient. We did complete a CSF examination to rule out infection. All 3 (6%) patients had bacterial meningitis. We gave vancomycin and meropenem to treat the infection and all 3 (6%) patients recovered from meningitis. For headaches, we have pain killers and for seizures gave sodium valproic acid.

Patients were given antibiotics, antiepileptics, pain killers, mannitol, acetazolamide, and anti-emetic. The follow-up period was 14 days through OPD. According to Ratilal et al. antibiotics prophylaxis should be given to prevent meningitis.²⁰ DeConde et al. described the management of CSF rhinorrhea.²¹

Limitations

Patients come from remote areas in PINS. So, they present late and there is less compliance with treatment in the community.

CONCLUSION

In our study, 96% of cases of CSF rhinorrhea are resolved by conservative management. Most cases of CSF rhinorrhea are resolved by conservative management.

Conservative management has the advantages of good outcomes, lesser hospital stays, and fewer complications as compared to surgery.

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Additional Information

Disclosures: Authors report no conflict of interest.

Ethical Review Board Approval: The study was conformed to the ethical review board requirements.

Human Subjects: Consent was obtained by all patients/participants in this study.

Conflicts of Interest:

In compliance with the ICMJE uniform disclosure form, all authors declare the following:

Financial Relationships: All authors have declared that they have no financial relationships at present or within the previous three years with any organizations that might have an interest in the submitted work.

Other Relationships: All authors have declared that there are no other relationships or activities that could appear to have influenced the submitted work.

AUTHORS CONTRIBUTIONS

Sr.#	Author's Full Name	Intellectual Contribution to Paper in Terms of:
1.	Rana Zubair Mahmood	1. Study design, methodology, and paper writing.
2.	Mukhtiyar Ahmed Lakho Rana Zubair Mahmood	3. Data collection and calculations.
3.	Sarfraz Khan, Rana Zubair Mahmood	4. Analysis of data and interpretation of results.
4.	Talha Abbas, Abdul Wajid, Umer Farooq	5. Literature review and referencing.
5.	Touqeer Ahmed	6. Editing.