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Ventriculo-Peritoneal (VP) Shunt failure rates have been estimated at approximately 11–25% within the first year after initial shunt placement, with most sources reporting a significantly higher number of shunt revisions and replacements among pediatric patients compared to adults.¹

The most common causes of shunt failure in both pediatric and adult populations are late shunt obstruction followed by early infection. Although obstruction and infection are the most common causes of shunt malfunction,

VP Shunt Complications: Ten Years Experience at UDMNINAS

Ventriculo-Peritoneal shunt is significantly associated with complications like malfunction and infection. In this study, we aim to review our infection and malfunction rate.

This is a retrospective review of charts of patients who underwent ventriculo-peritoneal shunt at Upendra Devkota Memorial National Institute of Neurological and Allied Sciences, Bansbari, Nepal between 2008 and 2018. Patients were interviewed via telephone for information regarding shunt complications in the form of malfunction, infection, and the need for revision.

A total of 357 patients underwent ventriculo-peritoneal shunt over a period of 10 years. Mean age of patients was 37.08 years. There were 224 males and 133 females with M:F::1.7:1. 265 patients were available over telephone for interview. 54 of 265 (20.37%) patients needed shunt revision. 32 (12.07%) of them had shunt malfunction. 21 (7.92%) of them had shunt infection. One (0.37%) patient had problems with overdrainage. Shunt complications were proportionate in pediatric population as well.

Shunt complication at Upendra Devkota Memorial National Institute of Neurological and Allied Sciences is comparable to international data.

Key words: Complications, Infection, Malfunction, VP shunt

other complications can occur as well, including bowel perforation, pseudocyst formation, and overdrainage.¹

Methods and Materials

This is a retrospective review of charts of patients who underwent VP shunt for varied reasons at Upendra Devkota Memorial National Institute of Neurological and Allied Sciences (UDMNINAS), Bansbari Nepal between 2008 and 2018. Patients were interviewed via telephone

VP shunt complications

for information regarding shunt complications in the form of malfunction, infection, and the need for revision.

Results

A total of 357 patients underwent VP shunt over a period of 10 years. Mean age of patient was 37.08 years (range 3 months to 83 years). There were 224 males and 133 females with M:F::1.7:1. 265 patients were available over telephone for interview. 54 of 265 patients needed shunt revision (20.37%). 32 of them had shunt malfunction. (12.07%) 21 of them had shunt infection. (7.92%). One patient had problems with over-drainage. (0.37%).

Pediatric subset analysis was done among those who were less than or equal to 16 years age. There were a total of 80 pediatric patients of which 55 were males and 25 were females with M:F::2.2:1. 49 of them were reachable via telephone of which there were 11 (22.44%) shunt revisions: six (12.24%) malfunctions and five (10.20%) infections. (Table 1)

	Shunt revision	Shunt malfunction	Shunt infection
Overall	20.37%	12.07%	7.92%
Pediatric patients	22.44%	12.24%	10.2%

Table 1: Percentage of shunt complications in the form of malfunction and infection

Discussion

Overall rate of shunt complication is reported to be 15-46% which is comparable.²⁻⁷ A lot of this is a data from short follow up while ours is a 10 years follow up.

Shunt complication is very high in pediatric population, up to 78% in a series by Reddy et al.⁶ Stone et al reported even higher complication, 84.5% of pediatric patients requiring one or more revisions and 4.7% requiring 10 or more.⁸ Our series shows significantly lower rate of complication in pediatric population compared to these data.

Early shunt infection is due to bacterial inoculation at the time of operation. Late shunt infection is due to secondary bacterial seeding.⁹ The most common causative organisms isolated from infected shunts in order of frequency are Staph epidermidis, Staph aureus, and gram negative rods. Staph epidermidis and Staph aureus are common skin flora, and infection typically occurs during shunt placement due to contamination from the skin.¹

Rate of shunt infection is 3 - 15%. with range being similar for pediatric patents.^{1,4,7,9-14} This is in par with our study results.

Antibiotic impregnated catheters are one example of a strategy to prevent shunt infection.¹⁵ Other effective means of reducing the rate of shunt infections include use of perioperative antibiotics, optimizing sterile technique, and reducing the time of the procedure.¹ For example, after adopting a strict protocol for shunt placement, including special attention to skin prep, perioperative antibiotics, and operating time not exceeding 40 min, and shunt infection was noted to drop from 17.9% to 8%.¹⁶ At our institute we use Chhabra shunt which is not antibiotic impregnated. We give perioperative antibiotic prophylaxis and follow no touch technique meticulously.

No touch technique has previously been demonstrated to lower the shunt infection threefold from 9% to 3%.¹⁷ Though with no touch technique our shunt infection rate stands at 8%, it is still lower compared to that reported in other series.^{1,4,7,9-14} The fact that the change of gloves before handling the shunt has been shown to be a simple and cost effective way to reduce postoperative shunt infections also stands in support of no touch technique.¹⁸ Glove holes during shunt handling has been cited as a significant risk factor for shunt infection.¹⁰

Conclusion

Shunt malfunction in the form of obstruction and infection at UDMNINAS with no touch technique is comparable to the international data with better results in pediatric population.

Conflict of Interest

None

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