Original Article

Lumboperitoneal Shunting in Patients with Normal Hydrocephalus

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ABSTRACT

Objective: To determine the success of lumbo-peritoneal shunt in cases of normal pressure hydrocephalus.
Study Design: Descriptive cases series study
Place and Duration of Study: This study was conducted at the Department of Neurosurgery, Sheikh Zayed Hospital, Rahim Yar Khan from 01-01-2015 to 01-01-2017.
Materials and Methods: 40 cases of normal pressure hydrocephalus of both genders with age range of 20 to 80 years were selected. The diagnosis of NPH was made on mini mental status examination and modified Rankin score along with normal CSF pressure. These cases then underwent LPS at Neurosurgery Department of Sheikh Zayed Hospital, RYK and were observed post operatively on intervals of 1 month, 3 month and 6 months where the final outcome was seen. The success was labeled as successful where there was 50% improvement in the either mini mental status examination or modified Rankin score done at baseline.
Results: In this study there were total 40 cases out of which 25 (62.50%) were males and 15 (37.50%) females with mean age of 57.62±7.21 years. The treatment success of LPS was seen in 33 (82.50%) out of 40 cases. Among the different parameters to label success in these 33 cases, the maximum improvement was seen in more than one parameters; which was seen in 18 (54.55%) of cases.
Conclusion: Lumbo-peritoneal shunt is efficacious in cases with normal pressure hydrocephalus where it is seen in every 8 out of 10 cases.

Key Words: NPH, VPS, LPS.

Citation of article: Umar S, Moez A, Sultan E, Bukhari MA. Lumboperitoneal Shunting In Patietns with Normal Pressure Hydrocephalus. Med Forum 2017;28(6):32-34.

INTRODUCTION

Normal pressure hydrocephalus (NPH) is syndrome of symptoms that was first recognized by Adams and Hakim. In this condition the ventricle become pathologically enlarged but the opening pressure on lumber puncture is normal. In contrast to the NPH, the other causes of communicating and non-communicating hydrocephalus are caused by some structural blockage to the cerebrospinal fluid (CSF) flow among the ventricular system. This can be caused by either stenosis of aqueduct of Sylvius or some other reasons causing compression over it. The incidence of normal pressure hydrocephalus (NPH) has varied in different studies from 2 to 20 per million per year.[1-3]
Normal Pressure Hydrocephalus has its classical presentation and can be diagnosed on the basis of urinary incontinence, disturbed gait and dementia or cognitive impairment. Early diagnosis and then proper intervention is the mainstay regarding the management of the NPH, because the damage done by this lesion is reversible. Computed Tomography (CT) brain and Magnetic resonance imaging (MRI) are the most common investigation choices to label the dilated ventricles and normal opening pressure to call it as NPH.[4-5] Ventriculo-peritoneal shunt (VPS) and lumbo-peritoneal shunt (LPS) are the most common treatment modalities. But there are no definitive guidelines regarding the placement of the shunt in such cases of NPH. The decisions are tailored on the availability of the resources, clinical expertise, presence of co morbid conditions and the chances of the complication rates and decisions are taken on individual basis. Lumbo-peritoneal shunts (LPS) are usually safe and the chances of complications like intracranial spread of infections are not associated with it as are with VP shunting. The most common complications of this are local collection of fluid in the back or abdominal cavity. The efficacy by LPS ranges from 60 to almost 90% of cases.[6-9]

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Received: April 01, 2017; Accepted: May 05, 2017

MATERIALS AND METHODS

This study was conducted at the Department of Neurosurgery, Sheikh Zayed Hospital, Rahim Yar Khan from 01-01-2015 to 01-01-2017.
Sampling Technique: Non-probability, consecutive sampling.
Sample selection; The cases were selected according to the following inclusion and exclusion criteria.
Inclusion criteria: 1. Both genders

2. Age 20 to 80 years
3. Cases of normal pressure hydrocephalus with symptoms of cognitive impairment, gait disturbance and urinary incontinence (assessed by mini mental status examination and modified Rankin score) along with the opening CSF pressure of 70-245 mm of H2O were included in the present study.

Exclusion Criteria: 1. Cases with communicative and non-communicative hydrocephalus other than NPH were excluded.
2. Documented cases of meningitis i.e. WBC count more than 50 cells/mm^3 on CSF analysis.
3. Cases with end stage liver cirrhosis, renal or cardiac failure.

In this descriptive cases series study, 40 cases of normal pressure hydrocephalus as per inclusion and exclusion criteria were selected. The detailed demographic and clinical data was collected to label them as case of NPH and to check for their base line cognitive and functional status in the form of mini mental status examination and modified Rankin score. The cases with no signs of meningitis by assessing on CSF fluid, were then underwent this lumbo-peritoneal shunting by consultant neurosurgeon at Neurosurgery Department of Sheikh Zayed Hospital, RYK and the shunt was placed. These cases were observed post operatively and then assessed periodically on intervals of 1 month, 3 month and 6 months where the final outcome was seen. The success was labeled as successful where there was 50% improvement in the either mini mental status examination or modified Rankin score done at baseline.

Statistical analysis;

The data was processed and analyzed by using SPSS version 20. Nominal and ordinal data were presented as mean ±SD (standard deviation) and in frequencies and percentages accordingly. Chi-square test was used to see for statistical significance and p value ≤0.05 was taken as significant.

RESULTS

In this study there were total 40 cases out of which 25 (62.50%) were males and 15 (37.50%) females (table 1). The mean age was 57.62±7.21 years (table 2). In the diagnosis of NPH, the cognitive impairment was the most commonly seen. It was observed in 32 (80%) cases, while gait disturbance and urinary incontinence were seen in 27 (67.50%) and 20 (50%) of cases respectively (table 1).

Table No.1: Study variables (A) n= 40

Variables	Numbers	%
Male	25	62.50
Female	15	37.50
Cognitive impairment	32	80
Gait disturbance	27	67.50
Urinary incontinence	20	30

The treatment success was seen in 33 (82.50%) out of 40 cases as in figure 1. Among the different parameters to label success in these 33 cases, the maximum improvement was seen in more than one parameters; which was seen in 18 (54.55%) of cases followed by cognitive improvement seen in 6 (18.18%) of cases as in figure 2.

Table No.2: Study variables (B) n= 40

Variables	Mean	Range
Age (years)	57.62±7.21	20-80
Mini mental status score	1.81±0.92	1-4
Modified Rankin score	2.12±1.03	1-4

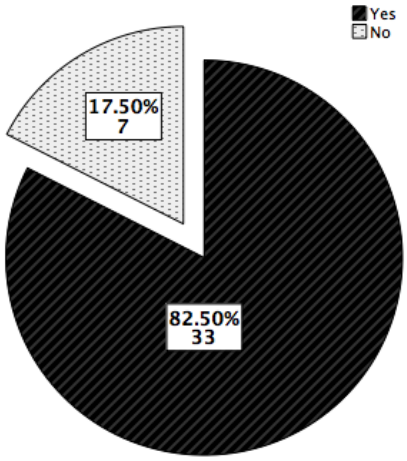

Figure No.1: Treatment success of LP shunt n= 40

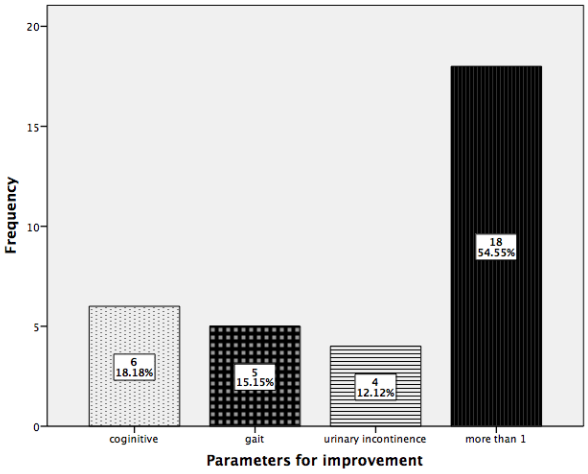

Figure No.2: Parameters of improvement in cases with successful treatment n= 33

DISCUSSION

Normal pressure hydrocephalus (NPH) can be defined as a range of clinical symptoms comprising cognitive impairment, urinary incontinence and gait disturbances in cases where the intracranial pressure is normal. It is also called as Adam-Hakim Syndrome. The prevalence

of NPH is relatively low as compared to the other potential causes of hydrocephalus and the presenting clinical symptoms. Therefore proper diagnosis and early intervention can decrease the morbidity and mortality in such cases. Ventriculo-peritoneal shunt and lumbo-peritoneal shunt are one of the most commonly underwent intervention. The treatment success was seen in 33 (82.50%) out of 40 cases. In a study conducted by Bloch et al, the success of LP shunt was seen in 73% of cases while there intervention was needed in 27% of cases.[10] While in another study conducted by Klinge et al, the good response of this surgical intervention was seen in 84% of cases. One patient was expired and re intervention was done in 15% of cases.[11] Bayer et al conducted a study in Turkey in their cases of normal pressure hydrocephalus to treat with LP shunt and it was seen that the good outcome was seen in more than 82% of cases and the cognitive important was the most well responded clinical symptoms.[12] While in the rest of the cases few complications were seen for which either shunt was removed or re insertion of the shunt was done. Considering the different complications the shunt occlusion was the most common type among the study done by Singh A et al.[13] The previous studies have also revealed that the LP shunt has better outcome than the VP shunt because of the lower incidence of intracranial complications such intra cerebral hemorrhages, malpositioning of the shunt and fits and due to this LP shunt is preferred over the VP shunt.[14-15]

CONCLUSION

Lumbo-peritoneal shunt is efficacious in cases with normal pressure hydrocephalus where it is seen in every 8 out of 10 cases.

Conflict of Interest: The study has no conflict of interest to declare by any author.

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