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Research Article

**LUMBOPERITONEAL SHUNTING IN PATIENTS WITH  
NORMAL PRESSURE HYDROCEPHALUS****Dr. Mehrun Nisa Tariq, Dr. Sehrish Mansoor, Dr. Mishal Sabir**  
House Officers, Lahore General Hospital**Abstract:**

**Objective;** To determine the efficacy of lumboperitoneal shunting in cases presenting with normal pressure hydrocephalus.

**Methodology:** This was a cases series study, conducted at LGH Lahore during January 2017 to December 2017. In this study the cases of NPH of either gender and age range of 15 years or more were included. The diagnosis of NPH was made according to clinical signs and symptoms on Mini mental status examination and Modified Rankin Score in cases with ventriculomegaly on CT brain plain and with normal opening pressure of 70-245 mm of H<sub>2</sub>O on LP. The cases with non communicating hydrocephalus and with meningitis were excluded. The lumbo peritoneal shunt was placed. Then these were followed for a period of 6 months and efficacy was labelled as yes where there was reduction of 50% of signs and symptoms either on mini mental status examination or modified Rankin score done at baseline.

**Results:** In the present study, 30 cases of normal pressure hydrocephalus were selected. Out of these 30, there were 17 (56.67%) males and 13 (43.33%) females. The mean age was 54.53±6.34 years. The mean mini mental status score and modified Rankin score were 1.76±0.97 and 2.47±1.21 respectively. The efficacy of LP shunt in NPH was seen in 25 (83.33%) of cases. There was no case of shunt occlusion seen at 6 months and there was no major side effect observed.

**Conclusion:** LP shunt is highly efficacious in cases of normal NPH and this is seen in every 8th cases treated with this.

**Key words:** NPH, LP shunt, Efficacy

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**INTRODUCTION:**

Hydrocephalus is defined as the dilatation of the ventricles in the brain. It can be classified into different subtypes according to their cut off definitions. It can be communicating and non communicating or it can be normal pressure or high pressure. Normal hydrocephalus (NPH) was first described by Adams and Hakim.[1].

In NPH, there is wide range of clinical spectrum that can lead to confusion, urinary incontinence, altered behavior and mild motor abnormalities. The underlying pathophysiology is due to dilatation of the ventricles with normal opening pressure on lumbar puncture (LP). This dilatation is thought to be due to stenosis of aqueduct of Sylvius or due to any other cause compressing it. The prevalence of NPH varies from 2 -20/ million per year globally.[2-3].

Definitive diagnosis is the tool to guide for further management. Computed Tomography (CT) and Magnetic resonance imaging are the most widely used investigation choices to label hydrocephalus and normal opening pressure make it able to categorize as NPH [4-5].

Ventriculo-peritoneal shunt (VPS) and lumbo peritoneal shunt (LPS) are amongst the most common treatments that are opted and each carrying its own benefits and side effect profile [6, 7]. Lumo peritoneal shunts (LPS) in the previous studies have shown good efficacy and minimal side effect profile and in the past the efficacy has been revealed ranging from 60-90% of the cases with normal pressure hydrocephalus [8-9].

**Objectives:**

To determine the efficacy of lumboperitoneal shunting in cases presenting with normal pressure hydrocephalus.

**Study Design:**

Case series.

**Study setting:**

Department of Neurosurgery, Lahore General Hospital, Lahore

**Duration of Study:**

January to December 2017

**Sampling Technique:**

Non-probability, consecutive sampling.

In this study the cases of NPH of either gender and age range of 15 years or more were included. The diagnosis of NPH was made according to clinical signs and symptoms on Mini mental status examination and Modified Rankin Score in cases with ventriculomegaly on CT brain plain and with normal opening pressure of 70-245 mm of H<sub>2</sub>O on LP. The cases with with non communicating hydrocephalus and with meningitis were excluded. The lumbo peritoneal shunt was placed. Then these were followed for a period of 6 months and efficacy was labelled as yes where there was reduction of 50% of signs and symptoms either on mini mental status examination or modified Rankin score done at baseline.

**Statistical analysis;**

The data was entered and analyzed by using SPSS-version 23. Frequency and percentages were calculated for qualitative data and mean and standard deviation for quantitative data.

**RESULTS:**

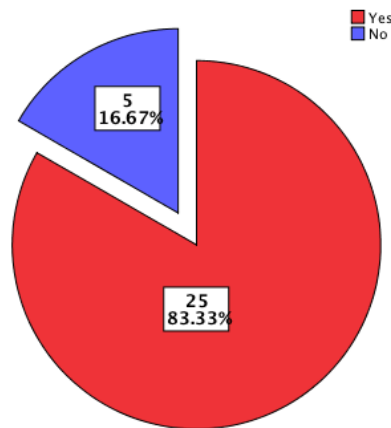
In the present study, 30 cases of normal pressure hydrocephalus were selected. Out of these 30, there were 17 (56.67%) males and 13 (43.33%) females as shown in table 01. The mean age was 54.53±6.34 years. The mean mini mental status score and modified Rankin score were 1.76±0.97 and 2.47±1.21 respectively as shown in table 02. The efficacy of LP shunt in NPH was seen in 25 (83.33%) of cases (figure 01). There was no case of shunt occlusion seen at 6 months and there was no major side effect observed.

**Table No. 1. Demographics in study subjects n=30**

Demographics	Numbers	%
Males	17	56.67
Females	13	43.33

**Table No. 2. Variables in study subjects**

Variables	Mean	Range
Age	54.53±6.34	15-80
Mini mental status score	1.76±0.97	1-4
Modified Rankin score	2.47±1.21	1-4

**Figure No. 1. Efficacy****DISCUSSION:**

Hydrocephalus is potentially a reversible disease and can be managed by various modalities and leading to the reduction in the clinical signs and symptoms. Normal pressure hydrocephalus is a known entity in the recent times but it is not that common and that's why the diagnosis can be missed initially. The definitive diagnosis and then relevant management steps can decrease the overall morbidity in such cases. Lumbo parietoneal shunts are considered as the safer treatment option in the recent times. The efficacy of the LP shunt was observed in 25 (83.33%) out of 30 cases. This was similar to the previous studies as well. According to Block et al, in their study the efficacy of LP shunt was observed in 73% of the cases. In few of the cases almost 1/4th of them lead to re intervention in contrast to single drainage shunt. Klinge et al, also carried out similar study and they found that the efficacy of LP shunt was seen in 84% of the cases with NPH in their study [11].

In another study by Bayer et al from Turkey also found the efficacy as 82% which was similar to the results of the present study [12]. There were no major side effect profiles were seen in the present study. According to Singh A et al, where they carried out similar study and they found that the shunt blockage was the most common side effect observed [13]. Various other studies compared the two modalities and they found that L[P shunt revealed better results than VP shunt; few of them found significant and the others non significant results [14-15].

**CONCLUSION:**

LP shunt is highly efficacious in cases of normal NPH and this is seen in every 8th cases treated with this.

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