Research Article

A Survey in Parents of The Patients With Shunted Hydrocephalus

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Abstract

This study was designed to evaluate the parents’ knowledge on hydrocephalus, shunt and their problems. The survey was planned to answer the questions regarding the socio-economic status of the parents, their knowledge on hydrocephalus such as definition, cause and treatment, shunts and shunt complications. Sixty parents answered the questionnaire. Of 60 parents, 31 were female and 29 were male. Education level of the parents had a significant effect on the knowledge of the parents regarding the definition and cause of hydrocephalus, and why a shunt is implanted. The children of the parents who had been given information about the disease and shunt had more frequent shunt revisions than those who do not.

In conclusion, no matter the education level of the parents, they should be informed and trained about the disease of hydrocephalus and signs and symptoms of shunt failure to prevent the morbidity and mortality of shunt complications.

Keywords: Cerebrospinal fluid shunt . Complication . Hydrocephalus . Parent

INTRODUCTION

Hydrocephalus is a pathological entity that has been known since Hippocrates and Galen (1). The incidence of congenital hydrocephalus is 0.5-2.5 in 1000 births (4,11). Hydrocephalus leads to significant changes in the brain such as morphology, biochemistry, circulation and maturation. The timing of treatment is very crucial in reversing the pathological changes in the brain. Cerebrospinal fluid (CSF) shunting is widely used in the treatment of hydrocephalus all over the world. Rekate(9) stated that the development of treatment plans effective in dealing with hydrocephalus has opened a Pandora’s box of new problems due to the creation of a large population of patients who are dependent on mechanical devices (“plumbing”) throughout their lives. Secondary goals of treatment should be the prevention of complication and the avoidance of shunt dependency if at all possible. We applied a questionnaire to the parent or caregivers of the shunted patients to evaluate their knowledge about...
METHODS

This study was designed to evaluate the parents’ knowledge on hydrocephalus, shunt and their problems. A survey was administered to either of the parents of the patients who had undergone a CSF shunt insertion. The survey was planned to answer the questions regarding the socio-economic status of the parents, their knowledge on hydrocephalus such as definition, cause and treatment, shunts and shunt complications. The aim of this study was as follows: (1) to determine the level of information of the parents on the disease and the care of the patients; (2) to find out the shortage of knowledge; and (3) to develop a training program for the parents.

Chi-square test and Fisher exact test were used in statistical analyses.

RESULTS

Of 60 parents who answered the questionnaire, 31 were female and 29 were male. The ages of the patients ranged from 1 month to 252 months (mean 50.79 months). All patient had undergone a ventriculo-peritoneal (VP) shunt insertion average 42.43 months ago (range: 1 to 244 months). Of 60 patients, 21 had at least one shunt revision. Fifteen parents (25%) checked the shunt function by pumping the flushing valve and 45 (75%) never pumped the shunt. The children of the parents, pumping the shunt valve had much more shunt revisions than those not pumping the shunt (P=0.005). Twenty (43%) and 2 (3%) of the parents claimed that they received the information regarding hydrocephalus and shunt from their physician and nurses, respectively. However 38 (63%) denied any information from the medical staff.

The parents were graduate of elementary school, high school and university in 35, 14 and 6, respectively. Five parents were illiterate. There was no correlation between the education status of the parents and the shunt complication rate. However more information the parents had, more shunt complications their children had (P=0.009) (Fig. 1). The rate of shunt complication or revision was 67% in the children of the parents with sufficient knowledge, and it was only 30% in the patients whose parents did not have sufficient knowledge on shunt complications. Education level of the parents had a significant effect on the knowledge of the parents regarding the definition and cause of hydrocephalus, and how the shunt is implanted (Fig. 2, 3 and 4). However, the parents did not significantly differ in knowing how the shunt works.

**Fig 1:** Bar graphic showing a significant difference in shunt revisions in the patients whose parents have sufficient and insufficient knowledge on symptoms and signs of shunt malfunction (P=0.009).

**Fig 2:** Graphic showing that the correct answer rate increased with the education of the parents (P=0.0001).
DISCUSSION

Hydrocephalus is a common condition of childhood, associated with many diseases. The mortality rate of hydrocephalus had been very high, up to 80% before the invention of shunts. Lawrence and Coates (7) reported the natural history of hydrocephalus based on 182 patients. They found that two thirds of untreated patients died by 18 months of age and 80% died by age 20-25. Shunting for hydrocephalus has become an everyday surgery in a pediatric neurosurgical practice. But shunts continue to have an unacceptably high complication rate. Shunt malfunction can be difficult for even experienced pediatric neurosurgeons to identify and treat (3). The overall shunt failure rate after 2 and 4 years in the Pediatric Shunt Design Trial was 52 and 62%, respectively (2,5). The probability of the occurrence of shunt malfunction in a combined review of 12 years of experience in Toronto and Paris was 81% [10]. In a series of 907 patients, the overall mortality rates at 1, 5, and 10 years were 4.5, 8.9, and 12.4%, respectively, from time of initial shunt insertion to death or last follow-up visit, and the number of infections had a statistically significant contribution to death (13).

Shunted infants had more frequent feeding problems and vomiting than those older. In this study, only 10% of the parents graduated from university. The knowledge of the parents on hydrocephalus, shunt and shunt complications did significantly vary with their education. We did not administer a neuropsychological test to the patients. Tromp et al. (12) noted that the IQ, educational level, and professional level of the parents all correlated significantly with the IQ of the child. However when the parents know about the signs and symptoms of shunt complications much, their children had more frequent shunt revisions. This did not mean that more educated parents do know more about the shunt complications. It is conceivable that the parents who had more knowledge about shunt complications could more easily recognized the shunt failure than those who do not had enough knowledge. Kirk et al (6) gave a shunt education program to the parents of hydrocephalic children. The posttest was given 2-3 weeks after the patient's surgery. There was a statistically significant change in the scores from the pre- and posttests for the parents whose children had undergone the initial shunt surgery. Therefore they concluded that the nursing education appeared to have a positive effect upon this group's knowledge of hydrocephalus and shunts.

Piatt (8) reported that the interval shunt pumping test is not sensitive enough to rule out the possibility of shunt malfunction, nor can a positive interval shunt pumping
test be considered an indication for an expensive diagnostic investigation in the asymptomatic patient. Although this was not a prospective study, the patients whose shunt had been checked by pumping had significantly more frequent shunt complications.

In conclusion, shunted infants had more common feeding problems and vomiting than those older. Education level of the parents had a significant effect on the knowledge of the parents regarding the definition and cause of hydrocephalus, and how the shunt is implanted. The children of the parents who know about the symptoms and signs of shunt complications had more frequent shunt revisions than those who do not. No matter the education level of the parents, they should be informed and trained about the disease of hydrocephalus and signs and symptoms of shunt failure to prevent the morbidity and mortality of shunt complications.

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**REFERENCES**