Original Article

A study of management and complications of congenital hydrocephalus at tertiary health care center

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Abstract

Introduction: Hydrocephalus remains one of the devastating and prevalent treatable forms of neurologic injury. Hydrocephalus is one of the most common forms of secondary neurologic injury. **Material and Methods:** The present study had been conducted at Bombay hospital and medical research center at marine lines. Bombay from august 2001 to October 2003. The study comprises 30 patients of congenital hydrocephalus which were not treated previously were admitted in pediatric and neurosurgery department. In the present study detailed clinical history, through physical and neurological examination were carried out in addition to routine investigations like CSF analysis, CT scan and MRI. **Result:** Investigation depends upon the cause of hydrocephalus but ct and MRI are the investigation of choice. In a case of vein of galen MR angiography is a investigation of choice. The USG is also sensitive but it doesn't rule out structural anomalies of brain. The treatment depends upon causes of hydrocephalus but Vp shunt is the treatment of choice. Out of 30 cases, 25 cases are treated by Vp shunt. One case of Arnold-chiari had undergone sub-occipitalcraniotomy + upper cervical laminectomy. One case has undergone intra-aneurysmal coiling.2 cases had received excision of meningo-mylocele with Vp shunt. 2 cases had not taken treatment. Out of 28 cases who had received the vp shunt as treatment, 10 cases shows shunt block, 10 cases shows shunt infection, 1 cases shows intestinal perforation, 1 case shows trans-anal migration. 6 cases done well without any complications **Conclusion:** CT and MRI are the investigation of choice. The drawback of USG is it doesn't rule out structural anomalies. Vp shunt is the treatment of choice. Shunt block and infection are the commonest complication of VP shunt.

Keywords: Congenital Hydrocephalus**,** Vp (Ventriculo-peritoneal) shunt, Galen MR angiography.

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INTRODUCTION

Since the middle of the last century, hydrocephalus has been treated using valve-regulated ventricular derivations, which continue to be widely used. Hydrocephalus remains one of the devastating and prevalent treatable forms of neurologic injury. Hydrocephalus is one of the most common forms of secondary neurologic injury. Unfortunately treatment has changed little in four decade and remains problematic. Incomplete and fragile. Hydrocephalus becomes a chronic disease of childhood. Historically because this association with congenital anomaly Spina-bifida and intra-ventricular hemorrhage hydrocephalus has been considered in domain of pediatric neurosurgeon. The present study consisting of congenital hydrocephalus including 30 cases of congenital hydrocephalus who had not undergone any treatment previously. The study mainly includes etiology of congenital hydrocephalus, clinical symptoms and management of hydrocephalus and the complication of shunt. In the last for decades we have shown that out treatment allows the hydrocephalus patient to survive in coming are we will peruse a higher level of function and lower complication rate. Technologic advance in recent years such as modern neuroscopy "adjusting values and possibility of telemetric flow and pressure monitoring ", promise of improve method of hydrocephalus treatment. To use the new technology and achieve a significant improvement in hydrocephalus care. However our understanding of CSF dynamic and brain pathology will need to expand beyond basic assumption of last century.

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Historical view:[1, 2,3,4,5] Hydrocephalus has been known to man through history and has been mentioned in most of the great classics of medicine. By Hippocrates, celsus and galen. As these authorities included all verieties of intracranial fluid collections, it is apparent that they did not recognize as a separate entity the collection of fluid within the ventricles. The first description of internal or ventricular hydrocephalus was noted by Rhazes (Mettler and Mettler). Vesalius gave a clear account of internal hydrocephalus and mentioned that infants with grossly enlarged heads could survive into adult age. In a personal studied case he noted that the collection of water was in the ventricles of the brain and that there was no water in any other place. Morgagni in 1761 confirmed the accumulation on fluid within the dilated ventricles and pointed out that the brain tissue may be reduced almost to the thinness of a membrane. Hydrocephalus[6]:It is defined as imbalance of CSF formation, absortion and circulation of sufficient magnitude to provide a net accumulation of fluid within cerebral ventricles. Although this usually leads to an elevation of intracranial pressure, compensatory adjustment may occur especially in infant and young children that can reduce the CSF pressure to normal range. Congenital hydrocephalus[7:] Hydrocephalus, which is detected at birth or perinatal or early infantile period is known as congenital hydrocephalus. CSF formation[6,8:] Cushing observed in 1941 formation of csf from the choroid plexus during intra-ventricular surgery. Dandy's experiments in 1919 demonstrating the development of munro and the absence of such dilatation if the choroid plexus was removed at the same time provide conclusively that the choroid plexus produce the fluid. Circulation of CSF[6,9,10]: The CSF is generally considered to circulate from the ventricles to the subarachnoid space and about the hemispheres to the arachnoid villi, which are the presumed sites of fluid absorption. Absorption of CSF[4,6]: Key and retzius, on the basis of their injection experiments, pointed to the pacchionian bodies as the site for CSF absorption. Absence of these bodies in childhood, as also in paes and canines, suggested that there must be alternative site of absorption. Classification of congenital hydrocephalus[7:] Non communicating hydrocephalus: 1. Congenital equeductal obstruction (stenosis) Gliosis, forking, true narrowing, septum. 2. Atresia of the foramina of luschkaandmagendia (dandy walker cyst)masses,Benign intracranial cysts, vascular malformations, tumors. Communicating hydrocephalus :Arnold-chiari malformation, Encephalocele, Leptomeningeal inflammations, Lissencephaly, Congenital absence of arachnoidal granulations. Post infectious congenital hydrocephalus[7]It is uncommon, accounts less than 10% of all causes of congenital hydrocephalus. Clinical features: The lesion site and size are next determined. 45% of lesions cross the thoracolumbar junction, 20% lie over entirely over the sacrum.

MATERIAL AND METHODS

The present study had been conducted at Bombay hospital and medical research center at marine lines. Bombay from august 2001 to October 2003. The study comprises 30 patients of congenital hydrocephalus which were not treated previously were admitted in pediatric and neurosurgery department. In the present study detailed clinical history, through physical and neurological examination were carried out in addition to routine investigations like CSF analysis, CT scan and MRI.

RESULT

Table 1: Investigation in case congenital hydrocephalus

Investigation	No. of cases	Percentage (%)
X-ray skull	20	5
USG skull	6	5
CT brain	25	25
MRi brain	10	10
MR angiography	2	2

Table 1: shows investigation in a case of congenital hydrocephalus. Investigation depends upon the cause of hydrocephalus but ct and MRI are the investigation of choice. In a case of vein of galen MR angiography is a investigation of choice. The USG is also sensitive but it doesn't rule out structural anomalies of brain.

Table 2: Treatment of congenital hydrocephalus

Treatment	No. of cases	Percentage (%)
VP shunt	25	5
Intra-aneurysmal coiling	1	3.3
Excision of meningomyelocele with VP shunt	2	6.6
Suboccipitalcraniectomy+upper cervical laminectomy (scucl)	1	3.3
Non treated	2	6.6

Table 2: Shows treatment in a case of congenital hydrocephalus. The treatment depends upon causes of hydrocephalus but Vp shunt is the treatment of choice. This matches with the study of oedaku and adeloya from Nigeria. Out of 30 cases, 25 cases are treated by vp shunt. One case of Arnold-chiari had undergone suboccipitalcraniectomy + upper cervical laminectomy. One case has undergone intraaneurysmal coiling.2 cases had received excision of meningomylocele with Vp shunt. 2 cases had not taken treatment.

Table 3: Complications in Vp shunt

Complications	No. of cases	Percentage (%)

Shunt infection	10	35.7
Shunt block	10	35.7
Transanal migration	1	3.5
Intestinal perforation	1	3.5
None	6	21.4

Table 3: Shows complications of vp shunt. Out of 28 cases who had received the vp shunt as treatment, 10 cases shows shunt block, 10 cases shows shunt infection, 1 cases shows intestinal perforation, 1 case shows transanal migration. 6 cases done well without any complications.

DISCUSSION

The prevalence of congenital and infantile hydrocephalus is between 0.48 and 0.81 per 1000 births (live and still),[11, 12] and a significant percentage of these patients will be left with persistent neurological deficits.[12, 13] In the United Kingdom and Ireland, the number of shunt operations is estimated to be 3500–4000 a year by the Cambridge based UK Shunt Registry. In the United States, about 125 000 shunt procedures are carried out annually at an estimated cost of $100 million.[14] the poor cognitive and motor development in children, the loss of the cognitive function, and visual loss can complicate untreated hydrocephalus and persist after treatment[15, 16, 17] with the consequent impairment interfering in their development in an important way. The present study is a study of 30 cases of congenital hydrocephalus in Bombay hospital who had not undergone treatment previously. Table 1: shows investigation in a case of congenital hydrocephalus. Investigation depends upon the cause of hydrocephalus but ct and MRI are the investigation of choice. In a case of vein of galen MR angiography is a investigation of choice. The USG is also sensitive but it doesn't rule out structural anomalies of brain. Table 2: shows treatment in a case of congenital hydrocephalus. The treatment depends upon causes of hydrocephalus but vp shunt is the treatment of choice. This matches with the study of oedaku and adeloya from Nigeria. Out of 30 cases, 25 cases are treated by vp shunt. One case of Arnold-chiari had undergone suboccipitalcraniectomy + upper cervical laminectomy. One case has undergone intraaneurysmal coiling.2 cases had received excision of meningomylocele with vp shunt. 2 cases had not taken treatment. Table 3: shows complications of vp shunt. Out of 28 cases who had received the vp shunt as treatment, 10 cases shows shunt block, 10 cases shows shunt infection, 1 cases shows intestinal perforation, 1 case shows transanal migration. 6 cases done well without any complications. In a follow up study of 6 months, it is found that the signs of raised ICT like vomiting, sign and level of consciousness has improved in all cases. In the study it is also found that not a single mother received folic acid in a preconceptional period. So it is very necessary for each and every mother to receive folic acid in preconceptional period for prevention of congenital hydrocephalus.

CONCLUSION

CT and MRI are the investigation of choice. The drawback of USG is it doesn't rule out structural anomalies. Vp shunt is the treatment of choice. Shunt block and infection are the commonest complication of VP shunt.

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