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Socio-economic Implications of the Surgical Treatment of Hydrocephalus

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Summary

AFOLABI OA and SHOKUNBI MT. Socio-economic Implications of the Surgical Treatment of Hydrocephalus. *Nigerian Journal of Paediatrics*. 1993; **20**: 94. Between July 1987 and June 1991, 38 patients presented to our service for the surgical treatment of hydrocephalus. The average age at presentation was nine months and the sex ratio was M:F = 1:2:1. Majority of the patients presented at advanced stage of the disease with gross head enlargement, psychomotor retardation and optic atrophy. Despite the willingness of the parents to have surgical treatment, there was an average delay of six weeks between confirmation of diagnosis and treatment, because of socio-economic reasons.

Introduction

IMPROVED outcome in cases of hydrocephalus, is associated with early cerebrospinal fluid diversion, [1] [2] while poor results are associated with delays in shunt insertion and with infection. [3] Although ventriculoperitoneal shunting is well established as an effective treatment for hydrocephalus, the use of this procedure is in practice, limited by several constraints, which must be critically examined, if our patients are to derive optimal benefit from the procedure. In the present retrospective study, the records of all patients who underwent ventriculoperitoneal shunting at the University College Hospital (UCH), Ibadan, were reviewed in order to evaluate the constraining factors encountered. The findings are discussed in the context of the prevailing socio-economic situation in Nigeria.

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Patients and Methods

The medical records of all the children who underwent insertion of venticuloperitoneal shunts at the UCH, between July 1987 and June 1991, were retrieved. The clinical details on each patient as well as the age at presentation and at surgery, the sex, duration of symptoms, presumed aetiology and the method of confirming the diagnosis for each patient were extracted from these records.

Results

There were 38 patients (21 males and 17 females, a male to female ratio of 1.2 to 1). The average age at presentation was 9.4 moths (range, one to 120 months). Twenty patients (52.6 per-

cent) presented before the age of six months, seven between six and 11 months, two between 12 and 18 months and nine patients presented after the age of 18 months. Progressive enlargement of the head was the reason for presentation in 32 (84.2 percent) of the patients. The occipito-frontal head circumference was greater than 97 percentile in 20 (52.6 percent) of the 38 patients, less than 97 in two (five percent) of them and was not recorded in the rest. The large head and severely restricted movements of the head and neck resulted in pressure sores on the scalp over the parietal bossing. The duration of symptoms before presentation is as shown in Table 1.

TABLE 1

Duration of Symptoms at Presentation

Duration (months)	*No of Patients*	*Percent of Total*
< 1	13	34
2 - 3	11	29
4 - 5	5	13
≥ 6	9	24
Total	38	100

Only 13 patients (34 percent) presented within one month of onset of symptoms. The duration for symptoms was six months or more in nine (23.7 percent) of the patients. Other notable clinical features included optic atrophy with loss of vision, seizures and unsteady gait. The average interval between presentation and corrective surgery (Table 11) was six weeks (range, one to 19 weeks). In 22 patients (58 percent), this interval exceeded one month. The delay was predicated by the need for parents to seek funds for the surgical operation.

Diagnosis was confirmed with ultrasonography in 15 patients, with ventriculography in eight patients and with computerized tomography in seven other patients. Diagnosis was entirely clinical, with no confirmatory investigations in the remaining eight patients. Based on the clinical and radiological findings, the aetiology of hydrocephalus was congenital in 20 patients (congenital aqueductal stenosis in 17 and congenital arachnoid cyst in three patients), while in 15 patients, there was a history of a preceding attack of meningitis. A tumour was present in two patients and a history of trauma was obtained in one patient.

TABLE 11

Intervals between Presentation and Surgery

Interval (weeks)	*No of Patients*
0 - 3.9	16
4 - 7.9	8
8 - 11.9	6
12 - 15.9	4
16 - 19.9	2
Unknown	2
Total	38

Discussion

Hydrocephalus results from an imbalance between cerebrospinal fluid production and absorption, causing a rise in intracranial pressure.[5] Ventriculoperitoneal shunting effectively reverses the manifestations of the disease. It is a common paediatric neurosurgical problem and constitutes 32 percent of congenital neurosurgical conditions in Ibadan.[3] In the present study, the major clinical picture in 52.6 percent of the patients was gross head enlargement and established neurological

deficits including optic atrophy with loss of vision and seizures. These features were indicative of advanced disease and they militated against optimal neurological recovery after treatment. Besides, modern medical treatment is relatively inaccessible and expensive to the average Nigerian and children with hydrocephalus usually come to the hospital by tortuous routes, after failure of treatment given by traditional healers. At presentation at the hospital with advanced disease, there are usually further delays before surgery and these are often caused by the inability of parents to get funds for the treatment. As has been shown in the present series, there was a delay which averaged six weeks before treatment.

During the period covered by the present study, the cost of shunt devices ranged between US $170 and US $450, the fee for surgery between ₦250 and ₦500 and the national per capital income between US $59 and US $250.[4] The exchange rate between the national currency, the naira (N) and the US dollar ranged between six and 22 to one. Thus, it can be seen that relative to the average family income, the financial burden of surgical treatment for hydrocephalus was quite large and this has become worse with the plummeting purchasing power of the naira. The impact of this economic predicament of surgical treatment could have been buffered by a national or state health insurance policy, but this unfortunately, does not exist at the present time. Private health insurance schemes which require that the cost of medical care be borne *ab initio* by the insured, are also rarely utilized.

Neurosurgical manpower in Nigeria is slim and poorly distributed. There are currently five neurosurgeons who provide neurosurgical services in a country of about 90 million people and they are all located in the southern part of the country. General and paediatric surgeons who are less disadvantaged numerically, are preoccupied with other interests and do not perform ventriculoperitoneal shunting. Considering that only a simple surgical armarmentarium is required for ventriculopertoneal shunting, this is perhaps one of the areas in which non-neurological surgeons should be encouraged to share the load of taking care of a common paediatric surgical problem. The provision of adequate manpower and facilities at the tertiary level of healthcare and the accessibility to this level of care, are matters that touch on government policy, its implementation and adequate budget to support such policy.

Innovative approaches to the surgical treatment of hydrocephalus would seem to be urgently needed in our economic circumstances. Choroid plexus coagulation is known to be effective to 50 percent of carefully selected cases.[6] This procedure requires only an initial investment in a paediatric endoscope and has the advantage of not requiring the implantation of an expensive device. Other device-free procedures include third ventriculostomy,[7] ventriculocisternostomy[8] and ventriculo-subarachnoid intubation.[9] Unfortunately, these procedures have not enjoyed widespread patronage, because of the technical simplicity of ventriculoperitoneal shunt device. In the absence of other conditions that may affect cognition, over 70 percent of infants with hydrocephalus will have a good surgical outcome for intelligence and schooling, if shunting procedure is performed early in the course of the disease.[2] It is likely that in the long term, enhancement of the socio-economic standard of the population will improve the outcome of the treatment of hydrocephalus. However, in the short term, the above alternatives to the ventriculoperitoneal shunt procedure require consideration, if the financial burden of the procedure will delay treatment.

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