NEUROSURGERY

Mortality and Morbidity Following Repair for Lumbosacral Myelomeningoceles

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ABSTRACT

A retrospective study of 220 infants with myelomeningoceles was carried out to evaluate the results of management by non-operative (NO) and Delayed Surgical Closure (DSC). One hundred and twenty infants were managed by NO versus 100 for DSC during a 14-year period. There was an increase in the number of infants with patchy sensory loss from 15% at admission to 25% at 3 months post admission in NO versus an increase from 19% to 60 % for DSC. Similar figures for faecal incontinence for NO were 50% to 55% versus 52% to 68% for DSC. Hospital mortality for NO was 33% versus 6% for DSC. Wound infection occurred in NO in 46% versus 10% for DSC. At 2 years in NO, there were no survivors versus 52 surviving children in DSC. This study suggests treatment by DSC compared to NO was more effective in decreasing the mortality and morbidity associated with management of lumbosacral myelomeningoceles *(Nig J Surg Res 2000; 2:139-143)*

KEYWORDS: Myelomeningoceles, delayed surgical closure, mortality, morbidity

Introduction

There has been continuing controversy on the best management option for spina bifida cystica (SBC) with severe neurological deficit since Lorber published his treatise on his subject in 1971.[1,2] Broadly speaking, there are two methods of post-natal management for myelomeningoceles with such neural deficits; conservative and operative repair within 48 hours of delivery of such infants with neural tube defects. Pressure of work and lack of hospital beds have, however, forced many surgeons into delaying operating for as long as one week on infants thus afflicted with SBC in some developing countries.[3] Advocates of the policy of non-operative intervention (NO) in SBC with severe neurological deficits argue that most of such infants will eventually die from the complications of SBC such as rupture and infection by a process of natural selection.[1,4] Surgery, they affirm, only serves to preserve cripple children who are incapable of an independent existence. Proponents of delayed surgical closure (DSC) for SBC with severe neurological deficit on the other hand argue that by DSC surgeons are helping to reduce the unacceptable mortality and morbidity associated with the conservative management of the neural anomaly.[3,5] The objective of this study was to comparatively evaluate the mortality and morbidity following management of lumbosacral myelomeningoceles with severe neurological deficits by NO and DSC.

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Material and Methods

A retrospective study of 220 conservative infants with lumbosacral meylomeningoceles associated with severe neural deficits was undertaken at the Jos University Teaching Hospital (JUTH). The study covered the period from 1986 to 1999. One hundred and twenty infants were managed by NO and this group included those infants whose parents opted for NO or could not afford operation fees. The remaining 100 infants were managed by DSC in which delayed operation was performed on the next routine operating list, usually within one week following diagnosis. The neurological status of the infants on admission, at 3 months and at 2 years are compared in Table 1. Criteria for severe neurological deficits included the recording at admission of any one of the following; lower limb paralysis extending to the hip or above, complete sensory loss at the same level and complete faecal or urinary incontinence. The number of infants who survived both management modalities at 2 years was also recorded. Cases of meningoceles have been excluded in other to limit the variables in patients selection to a minimum.

Results

The mean age of infants with myelomeningoceles for NO was 1.3 weeks versus 1.5 weeks for DSC. M:F ratio for NO was 1:3 versus 1.3:2 for DSC. Following management with NO and DSC at 3 months post admission, there were 80 versus 90 surviving infants in both groups respectively (Table 1).

Table 1: Neurological Status of Infants with Myelomeningoceles Managed by NO and DSC

Characteristics	At Admission		At 3 months		At 2 years	
	NO (n=120)	DSC (n=100)	NO (n=80)	DSC (n=90)	NO (n = 0)	DSC (n=40)
SENSORY LOSS:						
Patchy	18 (15)	19 (19)	20 (25)	54 (60)	-	(50)
Complete	102 (85)	81 (81)	60 (75)	36 (40)	-	(50)
MOTOR FUNCTION:						
Paralysis	85 (71)	70 (70)	58 (73)	60 (67)	-	(70)
Paresis	35 (29)	30 (30)	22 (27)	30 (33)	-	(30)
Normal	0 (0)	0 (0)	0 (0)	0 (0)	-	(0)
SPHINCTER FUNCTION:						
Faecal incontinence	60 (50)	52 (52)	44 (55)	61 (68)	-	(72)
Continent of faeces	60 (50)	48 (48)	36 (45)	29 (32)	-	(28)
Urinary incontinence	4 (3)	3 (3)	10 (13)	16 (18)	-	(25)
Continent of urine	116 (97)	97 (97)	60 (75)	74 (82)	-	(35)
Double incontinence	4 (3)	3 (3)	10 (13)	16 (18)	-	(25)
HYDROCEPHALUS	4 (3)	3 (3)	27 (34)	36 (40)	-	(30)

*Figures in parenthesis are percentages

Table 2: Hospital Mortality and Morbidity for Myelomeningoceles Managed by NO And DSC

Morbidity/ mortality	NO (n = 120)	DSC (n = 100)	TOTAL (n = 220)
Mortality	40 (33)	6 (6)	46 (21)
Wound Infection	56 (46)	10 (10)	66 (30)
Meningitis	6 (5)	2 (2)	8 (4)
Septicaemia	6 (5)	1 (1)	7 (3)
Neurotrophic ulcer	8 (6)	2 (2)	10 (5)

*Figures in parenthesis are percentages

Table 3:Management of Neural Complications in Infants Managed by NO and DSC

Complication	No. of Patients		Management	No. of Patients (%)	
	NO	DSC		NO	DSC
Hydrocephalus	27	36	V-P Shunt	0 (0)	2 (5)
			Acetazolamide	27 (100)	34 (94)
Neurotrophic Ulcer	8	2	Secondary suture	6 (75)	2 (100)
Flaccid paralysis	80	90	Physiotherapy	73 (91)	84 (93)
			Braces	3 (4)	21 (23)
Urinary Incontinence	10	16	Receptacle	3 (30	16 (100)

V-P = Ventriculo-peritoneal shunt

During this period in NO, the number of infants with patchy sensory loss increased from 15% at admission to 25% at 3 months post admission. For the DSC group, similar figures were 19% to 60%. The number of infants with complete paralysis in NO increased slightly from 71% on admission to 73 % at 3 months post admission while in the DSC group, the number with complete paralysis decreased from 70% to 67 %. For faecal incontinence, similar figures were a slight increase from 50% to 55% for NO versus an appreciable increase in number in the DSC group from 52% to 68%. The proportion with urinary incontinence in the NO group increased from 3% to 13% versus 3% to 18% in the DSC group during the same period. Double incontinence increased from 3% to 13% per cent in NO versus 3% to 18% in the DSC group. Hydrocephalus was recorded in 3% each of infants in the NO and DSC groups at admission, but increased to 34% and 40% respectively at 3 months post admission.

Hospital mortality at 30 days for infants in the NO was 33% versus 6% for DSC

(Table 2). Wound infection occurred in 46% of NO versus 10% of DSC; meningitis in 5% versus 2 % and septicaemia in 5% versus 1 % respectively. Neurotrophic ulcers distributed mainly on the buttocks and posterior thigh were recorded in 6 % of NO versus 2 per cent of DSC. Table 3 outlines the management of neural complications; Ventriculo-peritoneal shunts were employed in management for 5% of all cases of hydrocephalus in DSC while acetazolamide was employed in all cases in NO versus 94% in DSC. Secondary suture of deep neurotrophic ulcers was accomplished in 75% of all infants with ulcer in NO versus 100% in DSC. Physiotherapy for flaccid lower limb paralysis was employed in 91% of infants in NO versus 93% in DSC. Male infants with urinary incontinence were managed with soft rubber receptacles anchored around the penis in 30 % of NO versus 100% of infants in DSC. For NO, the number of surviving children recorded at 2 years was zero versus 52 for DSC.

Discussion

Our results indicate that there was a remarkable increase in the number of infants with patchy sensory loss at three months post admission following repair of myelomeningoceles in the DSC group. The same cannot be said, however, about motor and sphincter function when the NO group was compared with DSC group. Infact, the number of infants with faecal and urinary incontinence tended to increase at three months following operation in the DSC group. This is probably attributable to post operative gliosis in the spinal cord that may to worsen the inherent hydromyelia and tethering of the spinal cord in neural tube defects.[6] Inappropriate surgical treatment of spina bifida may also cause secondary lesions such as dermoid and epidermoid tumours which lead to the tethered cord syndrome.[7]

Hospital mortality in the NO group was about seven times higher than in DSC group due to attending complications of each management modality. Hydrocephalus, however, tended to occur at about the same frequency in the NO as in the DSC group at three months post admission. The number of ventriculo-peritoneal shunts performed at our centre especially for infants with hydrocephalus in the DSC group was small due to non-availability and the high prices of shunts. Currently, however, third ventriculostomy is being considered as an option for ventriculo-peritoneal shunts.[8] Bacterial complications such as wound infection, meningitis and septicaemia were more common in the NO compared to DSC due to rupture of unoperated cystic lesions with attendant infection.

In the final analysis, myelomeningocele is a common birth defect that is associated with significant life-long morbidity [9] as exemplified in the NO group. Despite improvements in paediatric surgery and overall patient care, little progress has been made in the post-natal surgical management of the child with spina bifida except for covering the spinal cord and preventing infection. A multi-disciplinary approach is usually necessary to meet up with the numerous interventions for hydrocephalus, tethered cord, scoliosis[10], faecal incontinence[11], urologic complications[12] and extremity anomalies,[13] even in infants operated. In this study, 52 disabled children were still alive at the end of two years in the DSC group compared to zero in the NO group. The message seems to be that intrauterine myelomeningocele repair might improve the neurological outcome in the absence of impressive results in outcome following post-natal repair[9,14] compared with non-operative intervention.

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