BRACHIAL PLEXUS PALSY IN THE NEWBORN

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Abstract

Background: Brachial plexus palsy is still a potential complication of difficult childbirth. Many affected infants recover with little or no residual deficits; however, others never regain sufficient extremity and go on to have functional limitations, bony deformities, and joint contractures.

Material & Method: The study included all children with weakness in the upper limbs who were admitted to the orthopedic clinic between January, 2000 and December 2001. This study was designed to determine the incidence of brachial plexus injuries in newborns at Al-Kadhimiya Teaching hospital and tried to follow the natural history of this problem.

Results: Of the 6221 live births at our hospital during the period of the study, 35 infants were diagnosed to have brachial plexus palsy, giving an incidence of 5.6 per 1000 live births. The affected infants were followed for at least one year. Thirty one (88.5 %) of these patients had full recovery by one year. Four patients (11.5 %) who were followed for at least two years had residual weakness

Conclusion: The over-all recovery from the injury was excellent in this study. The results justify the use of conventional non-operative management. Also identification of the maternal, fetal and delivery risk factors should alert physicians and led to appropriate corrective measures, when indicated to help prevent these neonatal complications.

Keywords: Brachial plexus, Newborn

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Introduction

Brachial plexus palsy in the newborn was first described in 1764[1], and its natural history has been discussed by many authors over the past century. The reported incidences have been ranged from 0.4 to 4.17 per 1000 live births, and these rates have not declined in the last few decades. The prognosis for full recovery, however, may have improved. Earlier studies reported complete recovery in only 13 to 18 percent of these patients[2,3], but more recent studies have claimed full recovery in 70 to 95 percent[4,5].

This study was designed to determine the incidence of brachial plexus injuries in newborns at Al-Kadhimiya Teaching hospital and tried to follow the natural history of this problem.

Materials & Methods

This is a prospective study conducted at Al-Kadhimiya Teaching Hospital. The study included all children with weakness in the upper limbs who were admitted to the orthopedic clinic between January, 2000 and December 2001.

A full detailed history from the parents of the child and from the medical records including age, sex, type of delivery, involved side, any associated fractures. All these children were examined by pediatrician, neurologist, and orthopedician for muscle tone, reflexes, passive and active range of motion to determine the type pf palsy (whether upper or lower brachial plexus involvement); loss of continuity or tender swelling over clavicle, presence or absence of Horner's syndrome or phrenic nerve palsy were sought. X-ray was carried out to rule out a fracture of clavicle or humerus in all affected infants.

The patients were followed up on an outpatient basis, the visits being scheduled once a week for one month, once a month for six months, and once every two or three months thereafter. At each examination, motion, motor strength, and function were documented.

The parents were taught how to put all of the joints of an involved upper extremity through a full range of movement several times a day. No orthosis were used.

Results

Of the 6221 live births at our hospital during the period of the study, 35 infants were diagnosed to have brachial plexus palsy, giving an incidence of 5.6 per 1000 live births. Of these, there were 20 (57 %) left side, 15 (43%) right side and no

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bilateral palsies. Thirty-two (91.5 %) were upper brachial plexus palsies, three (8.5 %) were lower brachial plexus palsies, four had associated homolateral fractured clavicle and humerus, and none had Horner syndrome or phrenic nerve palsy.

There were 21 affected males (60 %) and 14 females (40%). All but one infant were delivered vaginally (97%) (32 infants with vertex presentation, while two with breech presentation). One singleton (3 %) was delivered by cesarean section for fetal distress.

The affected infants were followed for at least one year. Thirty one (88.5 %) of these patients had full recovery by one year (Table 1). The average time to full recovery was three months, and the range was two weeks to twelve months. Four patients (11.5 %) who were followed for at least two years had residual weakness (Table 1).

Table 1: Birth and Recovery Factors in Brachial Plexus Palsy

Factor	Number (%)
GENDER	
Female	14 (40%)
Male	21 (60%)
DELIVERY	
Vertex	32 (91.5%) (18 forceps delivery)
Breech	2 (5.5 %)
Cesarean section	1 (3 %)
INVOLVED SIDE	
Left	20 (57%)
Right	15 (47%)
FRACTURES	
Clavicle	2
Humerus	2
Total	4 (11.5%)
DISTRIBUTION	
Upper plexus palsy	32 (91.5%)
Lower plexus palsy	3 (8.5%)
Total plexus palsy	none
RECOVERY	
Spontaneous	31 (88.5%)
Residual paralysis	4 (11.5%)

The patients who had residual weakness of an upper extremity all had a palsy of the fifth, sixth, and seventh cervical nerves. One of them had fracture of the clavicle, while the other patient had fracture of the humerus (Table 2).

Table 2: Patients with Incomplete Return of Neurological Function

Sex	Side	Palsy	Associated fracture	Residual paralysis
Male	Right	$C_5C_6C_7$	-	Shoulder & elbow
Female	Right	$C_5C_6C_7$	Clavicle	Shoulder & elbow
Male	Left	$C_5C_6C_7$	-	Shoulder & elbow
Female	Right	$C_5C_6C_7$	Humerus	Shoulder & elbow

Discussion

The incidence of brachial plexus palsy in our study was 5.6 per 1000 live births, compared with 0.4 to 4.17/1000 in other reports[6-8]. This high incidence could be attributed to many factors including: high incidence of maternal diabetes in our population, high parity, fetal distress, vaginal delivery, dystocia, perineal laceration, high birth weight, instrumental delivery, and bad obstetrical management.

The great majority of infants (88.5%) recovered normal brachial plexus function except four infants (11.5%) who had persistent weakness, after two years. None required surgery at the time being and all are develop mentally normal. The immediate and long term prognosis for this complication is therefore excellent in the great majority, as found in other studies[6-8].

Two patients had humeral and clavicular fractures that were due to birth trauma. Both had residual paralysis at the time of follow up. This could be due to the forced delivery that causes both the fracture and the brachial plexus palsy. However, the cases of so few patients do not yield sufficient data for us to conclude that a patient who had birth palsy and associated fractures due to birth trauma will have a poor prognosis than one who does not have these findings.

The patients who recovered fully all did so within one year. Several authors have concluded that major recovery may continue for as long as twelve months and that minor improvements may be seen in the span of an additional twelve months, but we know of no reports of improvements after two years.

The author does not believe in the use of abduction splintage, and recommends that the parents be carefully instructed how to put all upper limb joints of the affected limb through a full range of movement, each time the child is fed after the first week of life. A physician should check that this technique is being properly practiced at regular intervals.

Thus, the over-all recovery from the injury was excellent in this study. The results justify the use of conventional non-operative management. Also identification of the maternal, fetal and delivery risk factors should alert physicians and led to appropriate corrective measures, when indicated to help prevent these neonatal complications.

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