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THE PARALYZED BLADDER: CURRENT TREATMENTS

Inder Perkash*

Problems of the urinary tract are no longer the number one cause of illness and death in people with spinal cord injuries, as a result of research.

The spinal cord carries messages to and from the brain and to all parts of the body. Injury to the spinal cord leads to paralysis below the level of injury and to loss of bladder and bowel function.

Bladder dysfunction in people with SCI occurs because the external urethral sphincter muscle cannot relax adequately when the bladder muscle contracts to pass urine; therefore, urine is held. Medically this is referred to as "detrusor-sphincter dyssynergia." Individuals with SCI also do not have bladder control to hold urine, so urine may leak from time to time (incontinence). To determine the degree of neurologic damage to the bladder and outflow obstruction, urodynamic studies are carried out.

Nonrelaxation of the external sphincter muscle during attempted voiding produces high bladder pressure, which in turn can let the urine go back into the kidney. This is medically referred to as "vesicoureteral reflux." Since people with SCI hold large amounts of urine, the bladder can get infected easily. In addition, if vesicoureteral reflux is present, infected urine can backtrack into the kidneys, which also get infected.

Kidney infection usually manifests with chills and fever, which in medical jargon is "pyelonephritis." Repeated kidney infections lead to precipitation of calcium salts, resulting in the formation of stones in the kidney.

BLADDER DRAINAGE

Since SCI individuals are unable to expel urine at will, alternate methods have to be used to provide bladder drainage. Earlier in this century, bladder drainage was essentially provided with an indwelling Foley catheter or a suprapubic tube, where a tube is left in the bladder through the lower part of the abdomen. However, any tubes permanently left in the bladder lead to chronic irritation and infection. Long term use of catheters in the bladder have been shown to produce bladder stones, reflux, kidney stones, and permanent kidney damage.

Instead of leaving indwelling catheters for continuous bladder drainage, intermittent catheterization is now preferred. In this method, a catheter introduced every four to six hours to empty the bladder has reduced some of the ill effects of catheters left permanently in the urethra.

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system (sympathetic and parasympathetic), drugs have been used to counteract the action of sympathetic nerves to relax the bladder neck so that patients can pass urine on their own by bearing down. Examples of these antisympathetic drugs are prazosin (Minipress), phenoxybenzamine (Dibenzyline), and terazosin (Hytrin). For maximum benefit, optimal drug dosage and a check on voiding through voiding studies is necessary. Not all patients respond equally well to these drugs.

These drugs have also been found useful to control autonomic dysreflexia. This condition is found most often in patients with a spinal cord lesion above the T5-6 level and manifests with headache, rise in blood pressure, and slowing of the heart rate.

During intermittent catheterization, other autonomic drugs (anticholinergics) are used to reduce bladder-voiding pressures. By reducing voiding pressures to below 30-40 cm, patients do not leak urine. Therefore, they can also eliminate the need for leg bags. Intermittent catheterization in selected patients (usually lower paraplegics) can accomplish some degree of continence, and elimination of leg bags can reduce bladder infections. Some of our studies have shown that leg bags are great culprits for producing bladder infection. They need to be cleaned every day (preferably with a tablespoon of bleach in 200 cc of water) and then flushed in running water to remove the bleach.

High paraplegics and tetraplegics are prone to autonomic dysreflexia. This condition, usually related to a bladder full with urine, requires the need to do urgent evacuation. At times, this may not be easy. Drugs such as calcium channel-blockers (e.g.,Nifedpine) can help lower blood pressure temporarily.

SURGICAL SOLUTIONS

The permanent solution to bladder drainage may require surgery. Transurethral sphincterotomy, where cuts are made in the urethral sphincter through instrumentation (resecto-scope), can provide easy drainage all the time. However, then a leg bag and external catheter must be worn. Gentle tapping over the lower part of the abdomen can accomplish easy emptying of the bladder without catheterization. Long-term results of sphincterotomy are satisfying, since bladder infection and stone disease are infrequently noticed in the person with satisfactory bladder drainage.

Other surgical procedures, such as ileal loop to provide easy drainage of urine, have not withstood the test of time. There is a higher incidence of stone disease following diversion of urine in the ileal loop. However, surgical procedures where bladder capacity is enlarged (augmentation procedures) can benefit some selected patients with a small-capacity bladder. In particular, a spinal injured female who is leaking all the time may benefit from these procedures.

ELECTRICAL STIMULATION

An electrical bladder controller with implantable electrodes on nerve roots (usually sacral 2,3 and 4) supplying the bladder has been developed to improve bladder emptying. Long-term results following implants are still awaited. However, its use in female spinal injury patients seems exciting since it provides control on voiding by electrically stimulating the bladder.

Satisfactory results following electrical stimulation have also been reported in male paraplegics who developed control of voiding. Success of this operation depends on cutting of the sensory nerve roots when electrodes are placed on motor-nerve roots. However, this does lead to loss

of erection in males and is of concern to many patients.

CONCLUSION

Problems of the urinary tract are no longer the number-one cause of illness and death in people with spinal cord injuries. Bladder studies through urodynamics have improved our understanding, enabling scientific treatment of bladder dysfunctions. The availability of newer antibiotics has helped us to control infections more easily. As a result, mortality and morbidity due to kidney damage have been reduced significantly. Electrical stimulation with suitable electrodes and improved technology gives control of voiding to some SCI individuals, with elimination of bladder collection devices.

RAPID NEUROLOGICAL - EVALUATION OF LEPROSY PATIENTS IN FIELD.

Dr. G.N. MALAVIYA*

Nerve trunk damage is an usual accompaniment of leprosy though few cases can escape this altogether. Nerve damage may be a presenting symptom or appear while the patient is undergoing treatment. It can increase even under chemotherapy and may recover partially or completely with effective treatment[1]. The patients who develop reactions are at significant risk. Involvement of nerve trunk becomes obvious when pain is complained of or the deformity appears. However, in certain proportion of patients nerve damage progresses insidiously without any painful episodes[2].

The sensory-motor evaluation of the patient in MDT programme is essential to monitor the progress of patients. Baseline data about nerve trunk thickening and its functional status is needed for monitoring nerve function, to prevent onset and progress of deformities and for the final evaluation of the success of therapy.

There is a greater emphasis now on prevention of deformities and monitoring nerve function deficits in National leprosy eradication programme. Lack of trained staff and large number of patients to be attended make the task difficult. The routine assessment procedures are complicated and time consuming, at times discouraging the staff to make efforts for neurological examination of the patients. For each extremity it requires not less than 15 minutes for complete evaluation; one case therefore, needs about an hour. The whole exercise is thus laborious, time consuming and does not serve the very purpose efficiently for which it is to be performed.

There is an overwhelming need for simpler methods of testing in view of large number of leprosy patients which require to be tested. These assessment procedures should be easily understood by the staff and patients both, simple to perform, easy to interpret and record, and give reproducible results. In order to collect and record this information one need not have a detailed anatomical knowledge of nerve supply of extremities, muscle innervation etc. Since only very little time available for each case a working knowledge, which can help to detect the nerve involvement and damage in quickest possible way, seems adequate.

TECHNIQUE

A rapid neurological examination must test sensibility, mobility and trophicity i.e. function of autonomic nerve fibres[3]. Only sensory and motor functions need to be evaluated till better methods are available for testing the functions of autonomic nerve fibres.

Main nerve trunks involved in leprosy and the common sites of involvement are shown in figure 1. The cases who does not follow the common pattern can be sorted out for the detailed evaluation. There are only six main nerve trunks affected in leprosy. The tests should be performed on both sides but in a preset sequence to save time.

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Testing the sensibility

The back of the finger and thumb of the patient is carefully supported so that the joints are not moved while testing. Using the tip of an upright ball point pen, the skin of patient is gently dented with his eyes open asking him to point the spot. This is to explain the test to the patient. The test is then repeated with his eyes closed. The tip of a sharp pin can also be used for testing.

Representative areas to be tested on the palm and sole are shown in figure 2 and respectively. No sensory testing is required for facial, radial and common peroneal nerves. Even if the skin of sole is thickened, if it is pressed hard enough to dent the skin, the patient with normal sensations can feel[4]. The records can be written as present, partially present or absent.

Testing for thresholds of sensory perception is not required. Only detection of protective sensations is sufficient. It has been found by experience that if a patient can recognise exactly where he has been touched, using the tip of ball point pen pressing hard enough to dimple the skin, he will have protective sensation and painless injuries will probably, not occur[4].

Testing for motor functions

The motor assessment involves testing of some function carried out by muscles specifically innervated by the nerve under examination. The test should be specific enough so that trick movements are excluded. A set of quick tests assessing the relevant function for each nerve trunk has been summarised in table1.

To ensure accuracy of tests, the part to be put to test should be adequately supported. The patient's own flexed thigh or a table can provide this support. For feet, ground will give the desired support. The examiner has to stabilise the proximal part while the test is being performed.

Usually the tests are done against gravity in field conditions. The resistance should be applied gradually so that muscle under test can build up its strength. A quantitative grading is not required; only three grades can be considered:

Grade I	Total paralysis.
Grade II	Muscle weakness.
Grade III	Normal power.

Facial Nerve - Eye occlusion test is satisfactory and can be easily performed (Figure 4). Three grades are as follows:

Grade I can not close the eye.

Grade II can close the eye with effort but very few wrinkles are there around the affected eye. Grade III can close the eye normally with 'Squeeze'.

Ulnar nerve- Asking to perform abduction and adduction of middle finger, tests the interossei and is relaible (Fig. 5). Tests for flexor digiti minimi (Fig. 6) and adductor pollicis (Fig. 7) can also be added if required.

Median nerve- A request to abduct and oppose the thumb can be made and it is to be seen that the movement is properly performed. While rotating and abducting the thumb its nail should point upwards and not sidewards (fig. 8). Little finger will need support while performing the test. The resistance should be applied to the radial side of thumb while testing power in the muscle.

Radial nerve- Test for dorsiflexion of wrist against gravity will be impaired in high radial palsy (Fig. 9). However in cases who have low radial palsy (dorsiflexors of the wrist intact) independent extension of index finger is lost (Fig.10).

Common peroneal nerve- Patient can be asked to stand on his heel (one side at a time) or else he can be asked to dorsiflex his foot. Sometimes only great toe extensor is paralysed (Fig. 11).

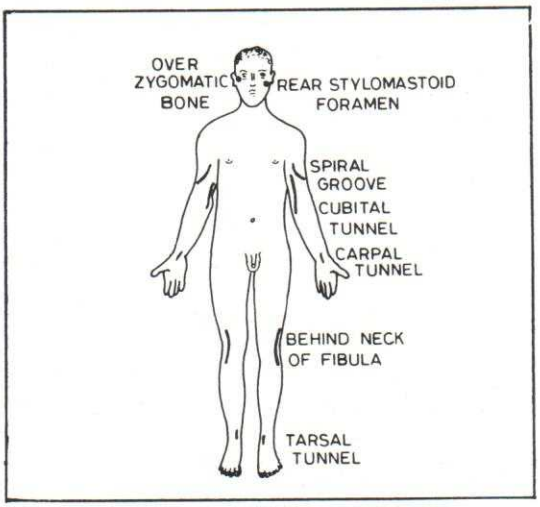

Figure 1 - Nerve Trunk Involvement in Leprosy.

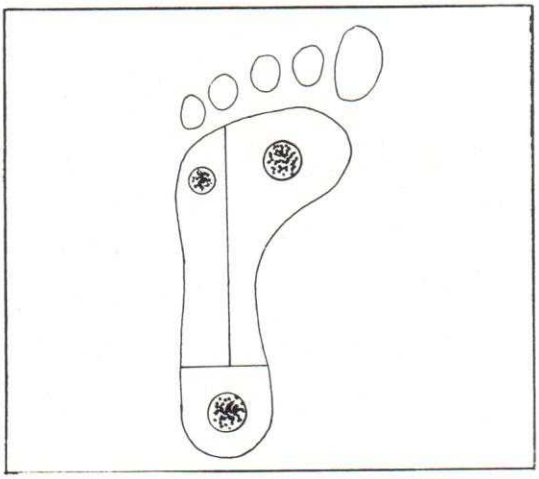

Figure 3 - Sites of sensory testing in sole.

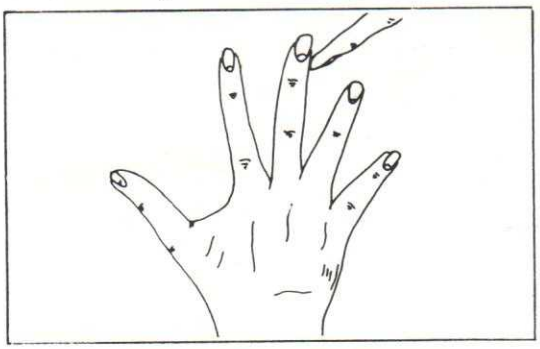

Figure 5 - Middle finger abduction and adduction test.

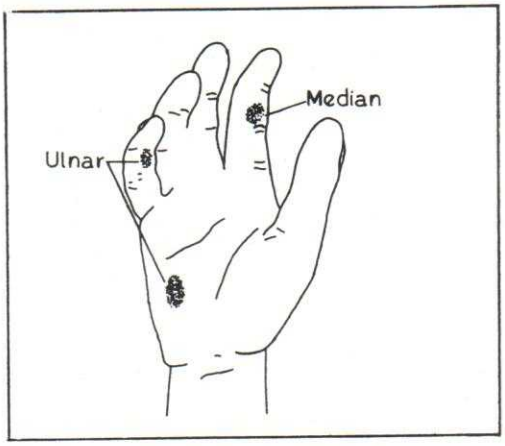

Figure 2 - Sites of sensory testing in palm.

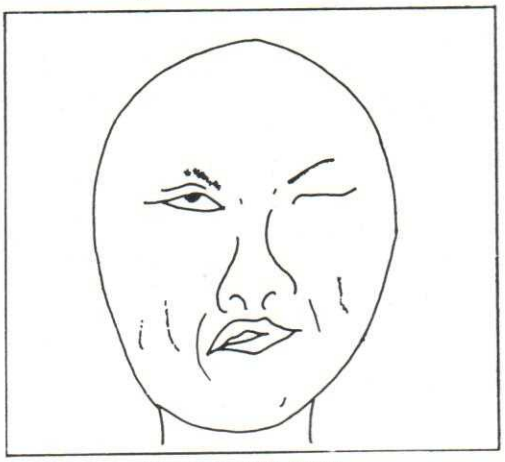

Figure 4 - Eyelid occlusion test.

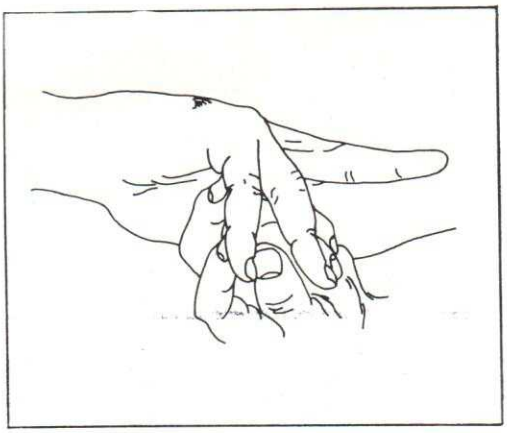

Figure 6 - Test for little finger MCP joint flexion.

Posterior tibial nerve- The patient can be asked to spread his toes or a test for abductor and flexor hallucis brevis can be performed as explained here. The patient while standing attempts to extend all his toes and then selectively depresses the great toe pushing the ground and tries to move it inwards (Fig. 13). The contraction of muscle is confirmed by palpation and at times can be seen as well. However, the patients who wear closed shoes regularly can find difficulty in performing these movements.

DISCUSSION

Prevention of deformity is the ultimate goal once a patient is made non infectious to the community. The aims in the field are to detect cases with early nerve damage and monitor progress of the cases who have sustained nerve damage. Base line disability records are one of the essential actions to minimise disability in leprosy patients. Detection of the nerve damage in early stage is desirable so that appropriate treatment can be started in time to prevent the progress of nerve damage and in certain proportion of cases reverse the damage. Once a weakness or paralysis is detected patient should be put under supervised treatment and frequently followed up.

Whenever a reduced sensation or strength is noted the patient is asked to think carefully whether these changes occured within past six months or so. If the patient says that the changes are recent the part is re-examined to verify the facts from the appearance of the part. There is no need for such details if the changes have occured more than a year ago. The most important indication for special neuritis treatment is recent loss of sensibility or strength. Deformity grading serves as a guide to the type of care to be given to the patient and also a means of measuring the quality of care being given. It therefore aids in planning and evaluating the programme for patient care.

The indications for special neuritis treatment and peripheral nerve surgery imply that the field staff should have, at their disposal, a technique of neurological examination which is easy to do rapidly, provides reliable information and can be repeated frequently with reproducible results[5].

Rapid examination is not a protocol with a scoring system expressing nerve damage and nerve recovery quantitatively. Sensory variations are less easy to assess but if we really want to prevent the development of deformity we should start making baseline records and keep regular followups of changes in muscle power[4].

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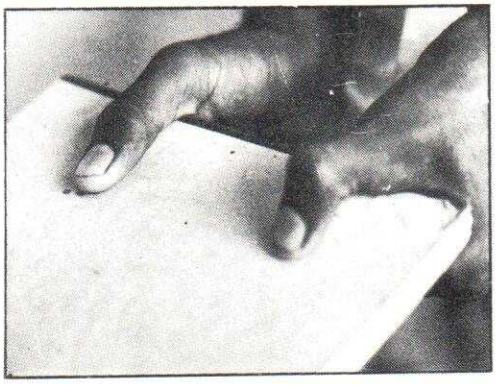

Figure 7 - Froments sign.

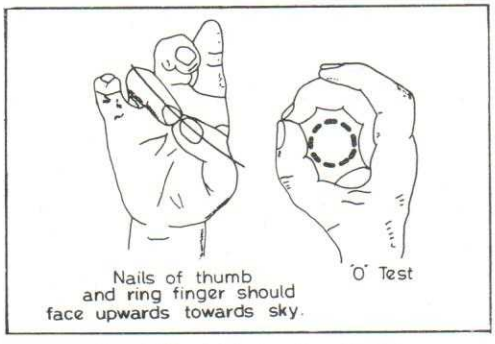

Figure 8 - Thumb abduction and opposition test.

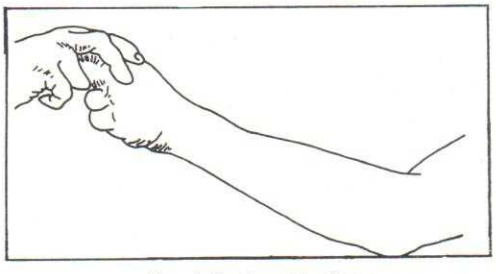

Figure 9 - Test for wrist dorsiflexors.

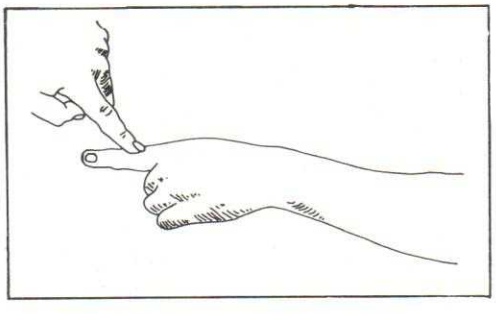

Figure 10 - Test for independent extension of index finger.

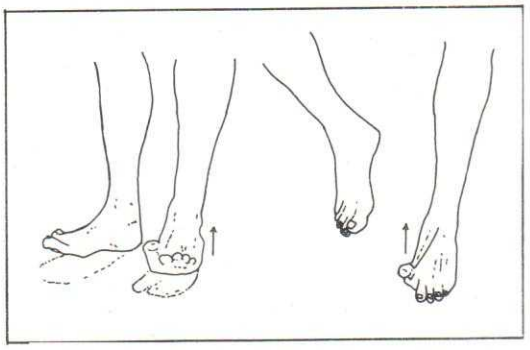

Figure 11 - Test for ankle dorsiflexion and great toe dorsiflexion.

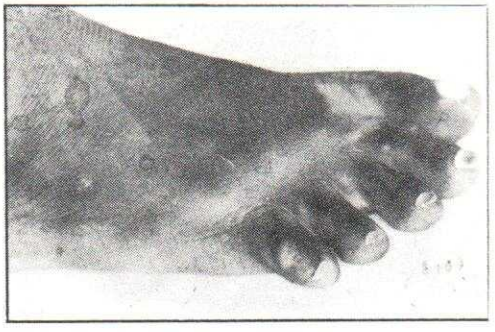

Figure 12 - Spreading of toes.

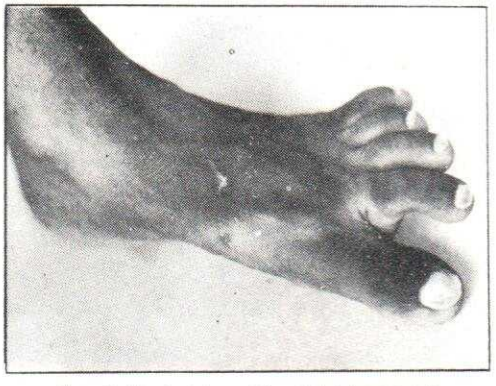

Figure 13 - Test for abductor & flexor hallucis brevis muscles.

TABLE : Tests for evaluation of motor functions of nerve trunks

Nerve Trunk	Site of Damage	Test Procedure	Reference To Figure
FACIAL	At stylomastoid Foramen	Total facial expressions	
	Over Zygomatic bone	Eye closure Test	4
ULNAR	Forearm	Flexion of distal inter phalangeal joint of little finger	-
	Wrist	1. Abduction and adduction of middle finger	5
		2. Flexion of metacarpophalangeal joint of little finger with interphalangeal joints neutral	6
		3. Adduction of thumb	7
MEDIAN	Forearm	Weakness of all extrinsic flexors of fingers.	-
	Wrist	Loss of abductionopposition of thumb	8
RADIAL	Upper arm	Wrist dorsiflexion	9
	Forearm	Independent extension of index finger	10
COMMON PERONEAL	Just below knee	1. Dorsiflexion of ankle	11
		2. Dorsiflexion of great toe	
POSTERIOR TIBIAL	At ankle	1. Spreading of toes	12
		2. Test for abductor/flexor hallucis brevis.	13

PREDICTION OF RECOVERY IN BELL'S PALSY FROM ELECTROPHYSIOLOGICAL FINDINGS

DR. NITYANANDA KAR*, DR. S.K. BANERJEE**

Sixty cases of Bell's Palsy between 8 to 72 years of age, 31 males and 29 females, wers subjected to electrodiagnostic study to find out a method in prediction of recovery in Bell's Palsy. Nerve Excitability of facial nerve, Strength-Duration curve of facial muscles and electromyography in facial muscles after 2 weeks of onset of Bell's Palsy are found to be broadly related to the prognosis of recovery. Un-impaired or slightly impaired nerve excitability, normal or slight denervation type of strength- duration curve and complete interference or reduced interference pattern in electromyography indicate complete recovery in almost all cases. Complete loss of nerve excitability, complete denervation type of Strength-Duration curve and single voluntary motor unit potential or discrete activity pattern in Electromyography indicate incomplete recovery in most cases, while absence of voluntary motor unit potential in E.M.G. predicts that complete recovery is not possible. Hence all the three tests are to be done to predict the outcome correctly.

Early prediction of recovery of Bell's Palsy is of paramount importance to alley patient's mental distress, to spare patients with good prognosis, the hazard of unnecessary treatment and also to find out the patients with poor prognosis who may require surgical intervention. Literature also reveals that early clinical findings of Bell's Palsy give limited prognostic information. Moreover, complicated expensive equipments like electrogustometry, electroneurography, Acaustic impedance audiometer etc. used for prognostication are not readily available in all centres. Hence our aim is to find out a method of prediction of recovery of Bell's Palsy from electrophysiological findings like Nerve excitability test, strength-duration curve and elecromyography, Campbell et al[1] (1962) found diminished excitability of facial nerve, indicating degeneration usually resulted within first 2-3 days of onset of palsy. Adler and Chace[2] found evidence of denervation in strength-duration curve as early as 5th day after onset of facial paralysis. Campbell et al[1](1962) stated fibrillation potential in E.M.G. indicating denervated muscle fibres were rarely detected before 10 days after onset of palsy. As nerve excitability, strength-duration curve and electromyography are helpful to detect denervation at different stages during the course of Bell's Palsy, it is hoped that prediction will be more accurate.

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MATERIAL AND METHOD

The study comprises sixty (60) patients of Bell's Palsy attending School of Physical Medicine, I.P.G.M.E. & R, Calcutta. Degree of facial palsy is graded as : Complete Palsy-No detectable facial movement; Moderate Palsy-Noticeable movement with asymmetry at rest and on movement; Mild Palsy-Symmetry at rest and asymmetry on movement. Electrodiagnostic tests like Nerve Excitability, Strength-Duration Curve and Electromyography were performed in every case first after 2 weeks of onset of palsy and repeated after one month. Nerve Excitability Test is carried out by stimulating the facial nerve trunk anterior to tragus with square wave pulses of 0.1 m.sec duration at an interval of 1 sec. The minimum voltage required to produce minimal visible contraction of facial muscles both in normal and affected sides are measured and classified as : (a) Unimpaired - No significant difference between healthy and diseased side; (b) mild impaired - considerable decrease in response to 0.1 m.sec. stimulus; (c) Moderately impaired - No excitability with 0.1 m.sec. stimulus but excitability with 1.0 m.sec. stimulus; (d) Severely impaired - No excitability with either 0.1 m.sec. or 1.0 m.sec. stimulus.

Strength-duration curve is plotted at motor points of facial muscles and classified as : (a) Normal exponential or No denervation type - Gradually increasing intensity of stimulus needed at pulse duration less than 1 m.sec; (b) mild denervation type - Complete curve with a kink and without shift to right; (c) Moderate denervation type - Curve with a kink and partial shift to right; (d) Complete denervation type - Curve is grossly shifted to the right with steep rise before 1 m.sec. and the threshold of stimulation is considerably higher than that of normal. For nerve excitability test and strength-duration curve constant current electronic stimulator (PLASS-7 Model) machine is used.

Electromyography of facial muscles is performed by Medelec E.M.G. Unit MS 4 Model machine and according to the number of voluntary motor unit potentials in E.M.G., the material is divided into five groups. Those with (1) No voluntary motor unit potential; (2) Single voluntary motor unit potential; (3) Discrete activity pattern; (4) Reduced interference pattern; (5) Complete interference pattern. The recovery is assessed as : (1) Complete recovery - complete restoration of voluntary movement with no asymmetry at rest or on movement and without any associated movement or contracture; (2) Good recovery - incomplete recovery with no paresis but with associated movement; (3) Fair recovery - incomplete recovery with mild paresis and with associated movement; (4) Poor recovery - incomplete recovery with moderate paresis with associated movement and contracture.

RESULTS

In present study youngest patient is 8 years old and oldest 72 years of age. 31 patients are male and 29 females. Out of 60 patients of Bell's Palsy 15 have mild, 21 have moderate and 24 have complete palsy. The electrodiagnostic findings of these cases at first examination and after one month shown in Table-I.

There are good corelation between clinical evaluation of facial strength and electrodiagnostic tests performed at first examination, shown in Table-II.

Prognosis of these cases according to electrodiagnostic findings at first examination are shown in Table-III.

DISCUSSION

In our study of 60 patients of Bell's Palsy, 12 cases had unimpaired nerve excitability test of which all (100%) showed complete recovery as in study of Wynnparry and King[3]. 11 cases had slightly impaired nerve excitability of which 10 (90%) had complete and 1 (10%) had fair recovery. Some workers [4,5,6] noted complete recovery in 85 - 90% cases with un-impaired nerve excitability, while May[7] reported complete recovery in 74% cases with unimpaired nerve excitability. In our study 13 cases showed moderately nerve excitability of which 5 (38%) had complete, 2 (15%) cases good and 6 (46%) cases had fair recovery. Some workers [4,5,8] noted complete loss of nerve excitability indicates denervation and full recovery is impossible. Whereas Wynnparry and King[3] concluded full recovery was possible after denervation. Our 24 cases showed complete loss of nerve excitability of which 6 (25%) had complete, 4 (17%) good, 8 (33%) fair and 6 (25%) had no recovery. Hence moderate to complete loss of nerve excitability indicates mostly incomplete recovery though complete recovery is also possible.

Our study revealed 12 cases with normal strength-duration curve and all of them recovered completely. 11 cases revealed slight denervation, 10(91%) of which recovered completely and 1 (9%) had fair recovery. 13 cases revealed moderate denervation of which 5 (38%) complete, 2 (15%) good and 6 (46%) had fair recovery. Remaining 24 cases showed complete denervation of which 6 (25%) complete, 4 (17%) good, 8 (33%) fair and 6 (25%) had no recovery. This shows no or slight denervation indicates almost complete recovery and moderate to complete denervation indicates incomplete recovery barring a few complete recovery. Nearly similar observations were found by Wynnparry and King[3].

In electromyography, number of voluntary motor unit potentials during maximal effort is broadly related to the final degree of recovery. Complete interference pattern indicated 100% complete recovery. Reduced interference pattern indicated complete recovery in 91% cases and fair recovery in 9% cases. Discrete activity indicated complete recovery in 38.5% cases. Good recovery in 15.5% and fair in 46% cases. Single voluntary motor unit potential in E.M.G. indicated complete recovery in 37.5% cases, good recovery in 19% cases, fair in 31% and poor in 12.5% cases. And no V.M.U.P. in E.M.G. indicated complete recovery in none, good in 12.5% fair in 37.5% and poor in 50% cases. Similar observations were found by other workers.[9,10] Absence of motor unit potential and presence of fibrillation potentials after onset of palsy have been interpreted to indicate incomplete recovery by workers.[11,12,13,14] Conversely, fibrillation potentials were observed in patients who ultimately recovered completely. In our study unimpaired or slightly impaired facial nerve excitability, normal or slight denervation type of strength-duration curve in facial muscles and complete interference or slightly reduced interference pattern in electromyography of facial muscles after 2 weeks of onset of Bell's Palsy indicate complete recovery in most of the cases, while severely impaired nerve excitability, complete denervation type of strength-duration curve and single voluntary motor unit or discrete activity pattern in E.M.G. indicate mostly incomplete recovery and complete recovery in very few cases. No voluntary motor unit potential in E.M.G. of facial muscles predicts no possibility of complete recovery but mostly poor recovery. Hence all three tests, nerve excitability, strength-duration curve and E.M.G., should be done particularly in severe palsy to predict the outcome correctly.

TABLE-I : Showing results of electrodiagnostic study at first examination compared with findings one month later.

Electrodiagnostic study		Time of Examination	
		First Examination	One month later
Nerve Excitability Test	Unimpaired	12 (20%)	24 (40%)
	Slightly impaired	11 (18%)	20 (33%)
	Moderately impaired	13 (22%)	6 (10%)
	Severely impaired	24 (40%)	10 (17%)
Strength-Duration Curve	Normal Type	12 (20%)	24 (40%)
	Slight Denervation	11 (18%)	20 (33%)
	Moderate Denervation	13 (22%)	6 (10%)
	Severe Denervation	24 (40%)	10 (17%)
Electro-myography	No V.M.U.P.	8 (13%)	4 (7%)
	Single V.M.U.P.	16 (27%)	6 (10%)
	Discrete Activity	13 (22%)	6 (10%)
	Reduced interference	11 (18%)	20 (33%)
	Complete interference	12 (20%)	24 (40%)

V.M.U.P. = Voluntary Motor Unit Potential.

TABLE-II: Showing comparison between degree of paresis and electrodiagnostic study at first visit

Electrodiagnosis at first visit		Degree of paresis at first visit visit		
		Mild Number-15	Moderate Number-21	Complete Number - 24
Nerve Excitability-Test	Unimpaired	12 (80%)	0	0
	Slightly impaired	3 (20%)	8 (38%)	0
	Moderately impaired	0	13 (62%)	0
	Severely impaired	0	0	24 (100%)
Strength-Duration Curve	Normal Type	12 (80%)	0	0
	Slight Denervation	3 (20%)	8 (38%)	0
	Moderate Denervation	0	13 (62%)	0
	Severe Denervation	0	0	24 (100%)
Electro-myography	No V.M.U.P.	0	0	8 (33%)
	Single V.M.U.P.	0	0	16 (67%)
	Discrete Activity	0	13 (62%)	0
	Reduced interference	3 (20%)	8 (38%)	0
	Complete interference	12 (80%)	0	0

V.M.U.P. = Voluntary Motor Unit Potential.

TABLE - III: Showing prognosis of Bell's Palsy according to electrodiagnostic study at first examination.

Electrodiagnostic Study		No. of cases	Degree of Recovery			
			Complete	Good	Fair	Poor
Nerve Excitability Test	Unimpaired	12	12 (100%)	0	0	0
	Slightly impaired	11	10 (91%)	0	1 (9%)	0
	Moderately impaired	13	5(38.5%)	2(15.5%)	6(46%)	0
	Severely impaired	24	6(25%)	4(17%)	8(33%)	6(25%)
Strength-Duration Curve	Normal Type	12	12(100%)	0	0	0
	Slight Denervation	11	10(91%)	0	1(9%)	0
	Moderate Denervation	13	5(38.5%)	2(15.5%)	6(46%)	0
	Severe Denervation	24	6 (25%)	4(17%)	8(33%)	6(25%)
Electro-myography.	No V.M.U.P.	8	0	1(12.5%)	3(37.5%)	4(50%)
	Single V.M.U.P.	16	6(37.5%)	3(19%)	5(31%)	2(12.5%)
	Discrete Activity	13	5(38.5%)	2(15.5%)	6(46%)	0
	Reduced Interference pattern	11	10 (91%)	0	1(9%)	0
	Complete Interference pattern	12	12 (100%)	0	0	0

V.M.U.P. = Voluntary Motor Unit Potential.

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Etiological Factors in Cerebral Palsy- A Hospital Based Study from Delhi

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Five hundred and fortyfour cases of cerebral palsy were studied to find the etiology. Male to female ratio was 1.9:1. Prenatal, natal and postnatal factors were found in 42 (7.72%), 238(43.75%) and 142(26.1%) cases respectively. 79(14.52%) cases were found to have more than one factor which could have contributed to brain damage. In 43(7.9%) cases the prenatal, natal and post natal history were normal and the cause was not known. Among the natal causes, birth anoxia was the most common etiological factor and was observed in 24.45% cases. Infections of the central nervous system comprised the major etiopathogenic factors of the postnatal causes. In cases where more than one etiology was present, the most frequent causes were a combination of prematurity or birth anoxia in association with the factors. The present study reveals that majority of the cases were found to have natal or post natal etiology.

The incidence of cerebral palsy in India is quite alarming with various reports having indicated that 1.5 to 3.5 per thousand of all live births may be followed by the child developing cerebral palsy. (NIPCCD Seminar 1989).

The etiopathogenic factors causing the static brain damage in cerebral palsy are of prenatal, natal or postnatal origin. Studies have shown that perinatal, vascular and anoxemic brain injuries are the most frequent etiological factors (Vining etal 1976, Illingworth 1058, Skavedt 1958, Woods 1957) while others (Hagberg etal 1975, Vanja 1982) have reported a high prevalence of cerebral palsy of prenatal origin. This study was carried out to find the etiological factors of cerebral palsy cases attending our hospital.

MATERIAL AND METHOD

A retrospective study of 544 cases of cerebral palsy attending the Department of Pediatrics and Physical Medicine & Rehabilitation of Safdarjang Hospital, New Delhi between 1981 to 1989, was done to find out the various etiological factors. The cases diagnosed as cerebral palsy included those cases who had suffered brain damage in the 'developing brain' as per definition of American Academy for Cerebral Palsy (Davis and Hill 1980). The classification of cerebral palsy was based on the major groupings as described by Mitchell (Mitchell 1961). Etiological factors were grouped as prenatal, natal, postnatal, mixed or unknown. Those cases where the neurological deficit followed a convulsion, with no history of any other etiological factor, were also included in the postnatal group. In cases where there were

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multiple etiological factors, they were labelled as 'mixed'. In the absence of history of any etiological factor, cases were labelled as of unknown etiology.

OBSERVATION

Out of 544 cases of cerebral palsy, there were 354 males and 190 females. Maximum cases were due to natal causes (43.75%) followed by postnatal causes (26.1% cases). 14.52% cases had more than one etiological factor, while in 7.9% cases there was no known cause. The various etiological factors operating in the prenatal, natal and postnatal period are shown in Table-2 Incases where more than one etiology was present, the most frequent causes were a combination of prematurity or birth anoxia in association with the factors (Table 1).

Of the neuromotor types of cerebral palsy, spasticity comprised the maximum number of cases (91.36%). The distribution according to topographic involvement of these 497 cases are shown in Table- 3. One case had a mixed clinical picture. No case of rigidity was found. Of the spastic group, it was observed that majority had causes of natal origin (44.98% cases), followed next by postnatal causes (26.51% cases). The distribution of the major etiological groups in relation to each clinical type is shown in Table-3. The different types of cerebral palsy in relation to each etiological factor are shown in Table-4 a,b,c.

DISCUSSION

A male prependerance was observed in our study, 65.07% cases were males while 34.93% cases were females. Izuora and Okoro (1981) have also reported the higher incidence in males. Our finding is in agreement with Basu (1969) who observed 60.8% males as against 39.2% females. Pederson etal (1982) and Makwabe and Mgone (1984) have observed very little difference between the two sexes. The male preponderance found in our study may not be a true high incidence of cerebral palsy, but a reflection of the traditional Indian family taking more interest in the male sibling in all spheres including medical attention.

Of the 544 cases, natal factors were responsible for majority of the cases (43.75%), followed by postnatal factors in 26.1% cases. Prenatal causes were least common (7.72% cases) (Table-I). Our observations are in accordance with Perlstein (1952), and O'Reilly and James (1981) who have found natal etiology to be the most common cause of cerebral palsy i.e. in 60% cases and 46.3% cases to be most common (48% cases). Makwabe and Mgone (1984) found birth anoxia and convulsions to be the predominant etiopathogenic factors. However, Vanja (1982) observed perinatal factors in 33% cases. In the present study, only 7.7% cases had prenatal etiology, while O'Reilly and James (1981), Perlstein (1952) and Hagberg etal (1975) found 38.5%, 30% and 21% cases respectively to be of prenatal origin. Vanja (1982) had reported the highest incidence of prenatal causes i.e. in 50% cases.

The incidence of postnatal cause was found to be high (45% cases) in the study of Manreen and Ogale (1982). A relatively high incidence was also found in our study (26.5% cases), while O'Reilly and James (1981), Perlstein (1952), Vanja (1982) and Hagberg etal (1975) have reported 15.2%, 10% and 6% respectively. In 14.5% cases of our series we have found multiple etiological factors while Vanja (1982) had reported 7% cases to be mixed etiology. Hagberg etal (1975) and Makwabe and Mgone (1984) observed that in 21% cases and 4% cases respectively, the cause was untraceable. In our study, 7.9% cases were of unknown etiology. (Table-5).

Of the etiological factors (Table-1) responsible for cerebral palsy, we found that of prenatal

factors, microcephaly (1.84% cases) and toxemia (1.29% cases) were the most common. Among natal factors, anoxia was the most common factor (24.45% cases). Infections of the central nervous system comprised the major etiopathogenic factor of the postnatal causes. 11.95% cases had encephalitis, while 5.15% cases had meningitis. O'Reilly and James (1981) in their study found multiple pregnancy and idiopathic factors to be the most frequent causes in the prenatal group i.e. 5.6% and 1.9% cases respectively. The most common natal etiology in their study was prematurity (22.7% cases) followed by anoxia (7.7% cases). In the postnatal group, encephalitis has been reported to be the most frequent factor (6.9% cases), which is similar to our observation.

Analysis of the etiological groups in relation to each clinical type revealed natal causes to be most common. Incidence of this etiological group in cases of monoplegia, paraplegia, quadriplegia, diplegia, ataxia and hypotonia were found to be 80.0%, 41.67%, 54.73%, 49.58%, 37.5% and 36.66% respectively. Birth anoxia has been repeatedly emphasised to be an important contributor to subsequent neurological handicap in the child, though the extent of anoxia which may be responsible for subsequent neurological handicap still remains a matter of controversy. We have observed that anoxia was consistently the most common etiologic factor among those cases with monoplegia, paraplegia, quadriplegia, diplegia and ataxia i.e. in 0.55%, 1.29%, 11.76%, 6.07% and 0.55% cases respectively. (Table-6).

In view of the large number of natal and postnatal causative factors responsible for cerebral palsy, which are by and large preventable, it is suggested that the maternal and child health services existing in the country be reinforced. The priorities should include provision of skilled obstetric and pediatric care at all levels of health delivery. In addition, measures should be taken to increase the awareness of the preventive aspects of cerebral palsy, in the community as well as medical professionals alike. This would go a long way in preventing and reducing the incidence of this major handicapping disorder.

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TABLE - 1 : MIXED ETIOLOGICAL FACTORS (n = 79)

					No. of cases
Prematurity	+	Anoxia			14
Forceps	+	Anoxia			7
Prematurity	+	Toxemia			6
Prematurity	+	Toxemia	+	Anoxia	6
Prematurity	+	Twin	+	Anoxia	5
Caesarean	+	Anoxia			5
Prolonged labour	+	Anoxia			5
APH	+	Anoxia			4
Toxemia	+	Anoxia			4
Prematurity	+	Twin			4
Prematurity	+	Breech			3
Prematurity	+	PH	+	Anoxia	3
Prematurity	+	APH			3
Breech	+	Anoxia			2
Toxemia	+	Low birth weight			2
Toxemia	+	PH			2
Toxemia	+	APH	+	Anoxia	2
Precipitale delivery	+	Anoxia			1
Microcephaly	+	Meningitis			1

*APH = Antepartum haemorrhage

TABLE - 2: DISTRIBUTION OF ETIOLOGICAL FACTORS (n = 544)

Prenatal	No.	(%)	Natal	No	.(%)	Postnatal	No.	(%)
Microcephaly	10	(1.84)	Anoxia	133	(24.45)	Encephalitis	65	(11.95)
Toxemia	7	(1.29)	Prematurity	22	(4.04)	Meningitis	28	(5.15)
Rubella	1	(0.18)	Prolonged labour	18	(3.31)	Convulsions	20	(3.68)
Toxoplasmosis	1	(0.18)	Forceps	15	(2.76)	Head Injury	13	(2.39)
Other maternal infections	6	(1.10)	Breech	12	(2.21)	Ac. Inf.Hemiplegia	8	(1.47)
			LBW < 2500g)	11	(2.02)	Neonatal Jaundice	8	(1.47)
APH	5	(0.92)	Post maturity	9	(1.65)			
Hydrocephalus	3	0.55)	Caesarean	8	(1.47)			
Drugs	3	(0.55)	Precipitale labour	5	(0.92)			
Twins	3	(0.55)	Cord around neck	3	(0.55)			
Consanguinity	1	(0.18)	Face presentation	2	(0.37)			
Diabetes	2	(0.37)						

TABLE - 3: ETIOLOGICAL GROUPS IN DIFFERENT TYPES OF CEREBRAL PALSY

Type	Total	Prenatal	Natal	Postnatal	Mixed	Unknown
		No. (%)	No. (%)	No (%)	No. (%)	No. (%)
Spasticity	n = 497	36 (7.24)	224 (45.07)	132 (26.56)	67 (13.48)	38 (7.65)
Quadriplegia	n = 190	8 (4.21)	104 (54.73)	44 (23.15)	22 (11.57)	12 (5.78)
Hemiplegia	n = 156	9 (5.77)	46 (29.49)	75 (48.08)	14 (8.97)	12 (7.69)
Diplegia	n = 119	13 (10.92)	59 (49.58)	8 (6.72)	28 (23.53)	11 (9.24)
Paraplegia	n = 24	4 (16.67)	10 (41.67)	5 (20.83)	2 (8.0)	3 (12.50)
Monoplegia	n = 5	-	4 (80.00)	- -	1 (20.00)	- -
Triplegia	n = 3	2 (66.67)	1 (33.33)	- -	-	- -
Hypotonia	n = 30	4 (13.33)	11 (36.66)	1 (3.33)	10 (33.33)	4 (13.33)
Ataxia	n = 8	1 (12.5)	3 (37.5)	2 (25.0)	1 (12.5)	1 (12.15)
Athetosis	n = 7	- -		6 (85.71)	1 (14.3)	- -
Tremor	n = 1	- - - -		- -	- -	1 (100.00)
Mixed	n = 1	-	-	1 (100.0)	- -	- -

TABLE - 4 a : TYPE OF CEREBRAL PALSY IN RELATION TO ETIOLOGY (PRENATAL GROUP)

Etiology	Mono	Hemi	Para	Tri	Quad	Dip	Total	Athet	Ataxia	Hypo	Tremor
	No.(%)	No.(%)	No.(%)	No.(%)	No.(%)	No.(%)	No.(%)	No.(%)	No.(%)	No.(%)	No.(%)
Microcephaly	-	1(0.18)	-	1(0.18)	2(0.37)	6(1.1)	10(1.84)	-	-	-	-
Toxemia	_	2(0.37)	2(0.37)	-	-	2(0.37)	6(1.10)	-	-	1(0.18)	-
Other Maternal infections	-	3(0.55)	2(0.37)	-	1(0.18)	-	6(1.10)	-	-	-	-
A.P.H.	-	-	-	-	1(0.18)	4(0.74)	5(0.92)	-	-	-	-
Hydrocephalus	-	-	-	-	-	-	-	-	1(0.18)	2(0.37)	-
Drugs	-	3(0.55)	-	-	-	-	3(0.55)	-	-	-	-
Twins	-	-	-	1(0.18)	1(0.18)	1(0.18)	3(0.55)	-	-	-	-
Diabetes	-	-	-	-	1(0.18)	-	1(0.18)	-	-	1(0.18)	-
Consanguinity	-	-	-	-	1(0.18)	-	1(0.18)	-	-	-	-
Rubella	-	-	-	-	1(0.18)	-	1(0.18)	-	-	-	-
Toxoplasmosis	-	-	-	-	1(0.18)	-	1(0.18)	-	-	-	-

TABLE - 4b: TYPE OF CEREBRAL PALSY IN RELATION TO ETIOLOGY (NATAL GROUP)

Etiology	Mono	Hemi	Para	Tri	Quad	Dip	Total	Athet	Ataxia	Hypo	Tremor
	No.(%)	No.(%)	No.(%)	No.(%)	No.(%)	No.(%)	No.(%)	No.(%)	No.(%)	No.(%)	No.(%)
Anoxia	3(0.55)	16(2.94)	7(1.29)	1(0.18)	64(11.76)	33(6.07)	124(22.79)	-	3(0.55)	6(1.10)	-
Prematurity	-	7(1.29)	-	-	2(0.37)	12(2.21)	21(3.86)	-	-	1(0.18)	-
Prol.Labour	-	4(0.74)	1(0.18)	-	11(2.02)	2(0.37)	18(3.30)	-	-	-	-
Forceps	-	5(0.92)	1(0.18)	-	6(1.10)	-	12(2.21)	-	-	3(0.55)	-
Breech	-	4(0.74)	1(0.18)	-	5(0.92)	2(0.37)	12(2.21)	-	-	-	-
LBW	-	2(0.37)	-	-	4(0.74)	5(0.92)	11(1.29)	-	-	-	-
Postmaturity	-	1(0.18)	-	-	3(0.55)	4(0.74)	8(1.47)	-	-	1(0.18)	-
Caesarean	1(0.18)	4(0.74)	-	-	3(0.55)	-	8(1.47)	-	-	-	-
PPT.Labour	-	2(0.37)	-	-	3(0.55)	-	5(0.92)	-	-	-	-
Cord around neck	-	-	-	-	2(0.37)	1(0.18)	3(0.55)	-	-	-	-
Face Presentation	-	1(0.18)	-	-	1(0.18)	-	2(0.37)	-	-	-	-

TABLE - 4 c : TYPE OF CEREBRAL PALSY IN RELATION TO ETIOLOGY (POSTNATAL GROUP)

Etiology	Mono No.(%)	Hemi No.(%)	Para No.(%)	Tri No.(%)	Quad No.(%)	Dip No.(%)	Total No.(%)	Athet No.(%)	Ataxia No.(%)	Hypo No.(%)	Tremor No.(%)
Encephalitis	-	24(4.41)	-	-	29(5.33)	8(1.47)	61(11.21)	1(0.18)	2(0.37)	-	-
Meningitis	-	22(4.04)	1(0.18)	-	5(0.90)	-	28(5.15)	-	-	-	-
Convulsions	-	10(1.84)	4(0.74)	-	5(0.90)	-	19(3.49)	-	-	1(0.18)	-
Head injury	-	11(1.29)	-	-	2(0.37)	-	13(2.39)	-	-	-	-
Ac infantile hemiplegia		8(1.47)	-	-	-	-	8(1.47)	-	-	-	-
Neonatal Jaundice	-	-	1(0.18)	-	2(0.37)	-	3(0.55)	5(0.92)	-	-	-
Mixed	1(0.18)	14(2.51)	2(0.37)	-	22(4.04)	28(5.15)	67(12.37)	1(0.18)	1(0.18)	10(1.84)	-
Unknown	-	12(2.21)	2(0.37)	-	12(2.21)	11(2.02)	37(6.80)	-	1(0.18)	4(0.74)	1(0.18)

TABLE -5: COMPARISON OF ETIOLOGICAL FACTORS WITH OTHER STUDIES

Author/Place of Study	Prenatal	Natal/Perinatal*	Postnatal	Mixed	Unknown
1. Peristein, U.S.(1952)	30%	60%	10%	-	-
2. Hagberg etal, Sweden (1975)	21%	48%*	6%	-	21%
3. O'Reilly and James, Missouri (1981)	38.5%	46.3%	15.2%	-	-
4. Vanja, North West, U.S.(1982)	50%	33%*	10%	7%	-
5. Maureen & Ogale, Nigeria(1982)	-	48%	45%	-	-
6. Makwabe & Mgone, Tanzania(1984)	-	24%	72%	-	4%
7. Present study, Delhi (1990)	7.7%	43.8%	26.1%	14.5%	7.9%

DYNAMIC KNEE-ELBOW SPLINT

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Post-traumatic and post-surgical stiffness of any joint, more so of knee and elbow joint, is a common problem encountered in Orthopaedic practice. A simple, versatile, economical and easy to use splint has been designed for early mobilisation of elbow and knee joint so as to prevent and treat stiffness of these Joints.

Stiffness of any joint is commonly encountered in any Orthopaedic practice, arising from a variety of causes. The problem is more pronounced in elbow and knee joints due to its peculiar functional anatomy. Treatment is often difficult and prolonged and methods range from corrective manipulations under anaesthesia, skin and skeletal tractions, to surgical corrections followed by early mobilisation of the joint, using sophisticated and expensive continuous passive motion (C.P.M.) devices or cheap and simple, yet cumbersome and not so effective splints such as Pearson knee flexion attachment, Fisk Splint, Tulloch Brown Tibia U-loop, etc.

The Orthopaedic Surgery Department of Goa Medical College has designed a simple dynamic splint which can be used to prevent and treat knee and elbow stiffness. The simple construction makes the splint easily reproducible by any orthotic workshop, cheap, easy to use and allows the patient to be ambulatory during treatment. The splint can be used both in children as well as in adults.

The splint is made of aluminium and consists of two portions-a mainframe (Fig 1-A) and the other movable attachment (Fig 1-B) which is dynamised with a pair of springs. The main frame has a padded gutter, with cloth corset and straps with Velcro Fastner which accomodates the upper arm or thigh. The gutter has a 'U' shaped curved extension which is straight uptil the joint it encompasses and then turned towards recurvatum position to achieve the dynamic extension. Free mechanical joint is provided at the level of anatomical joint with a padded gutter and corset at the end of extension to hold the distal portion of the limb. This is attached to the 'U' shaped band with the aid of pair of springs on either side to achieve necessary extensions and flexion against resistance. Number of holes are provided on the band 'A' so as to enable to adjust the length of spring and to provide required tension.

It is thus that the movements obtained are active and not passive as opposed to the other available splints and devices. This not only prevents muscle wasting but aids in muscle build up

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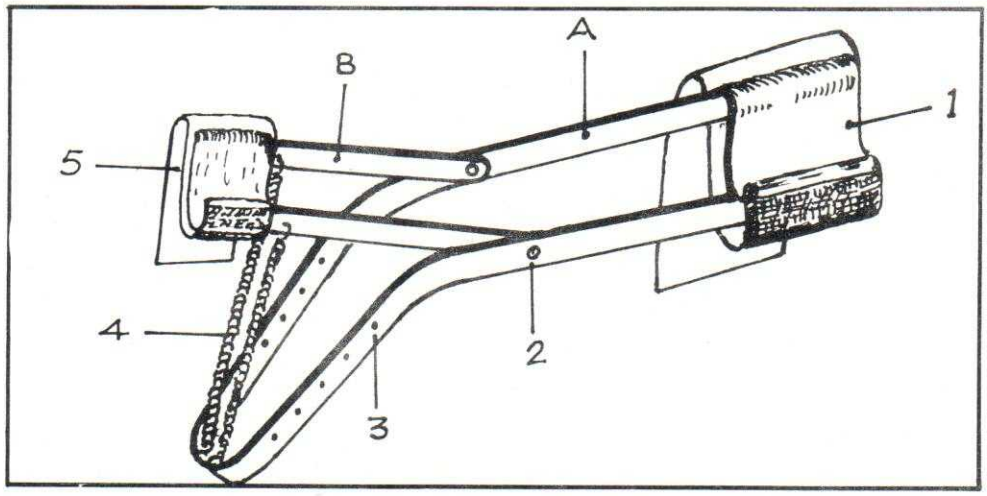

Fig 1: Diagramatic Illustration of Dynamic Knee-Elbow Splint.
A- Main Frame, B- Mobile Attachment,
1- Upper Arm / Thigh Gutter, 2- Mechanical Joint,
3- Holes for Spring adjustment, 4- Springs,
5- Gutter for Distal Part.

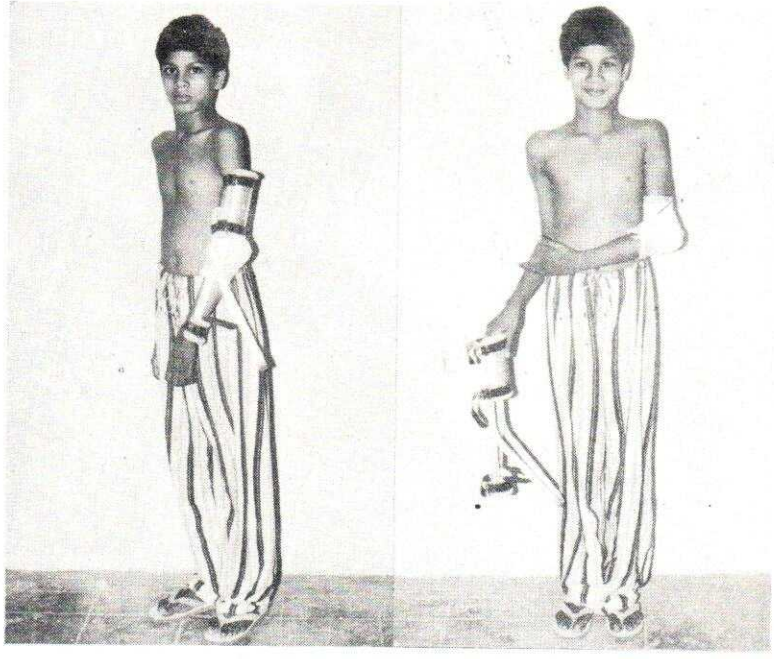

Fig. 2: Splint in use following Elbow Surgery

This splint has been extensively used with encouraging results for the following conditions in Goa Medical College.

Elbow: -Post-traumatic stiffness. Intra-articular fractures (both conservative and surgical management), myositis ossificans traumatica. During active management of burns and after surgical release of burns contracture, arthrolysis, excision arthroplasty, synovectomy in rheumatoid and tubercular arthritis, release of triceps contractures, after arthorotomy in septic arthritis of elbow joint.

Knee: Post-traumatic stiffness. Intra-articular fractures (conservative as well as surgical). Active management of burns and after surgical correction of burns contractures, synovectomy in rheumatoid arthritis, tubercular arthritis, synovial osteochondromatosis and other similar condition, release of quadriceps contractures, recurrent dislocation of Patella.

Conclusion:

A new useful dynamic splint designed in this Institution has been presented which can be used for both the elbow and knee Joint. It is easy to manufacture, economical, light weight, versatile and easy to use and has indication for use in variety of conditions not only to prevent stiffness of Joint but also to treat the same. Patient is ambulatory. The splint works on dynamic principle and hence helps to build up the muscle tone. Thus it has advantage over many of the conventional splints and devices.

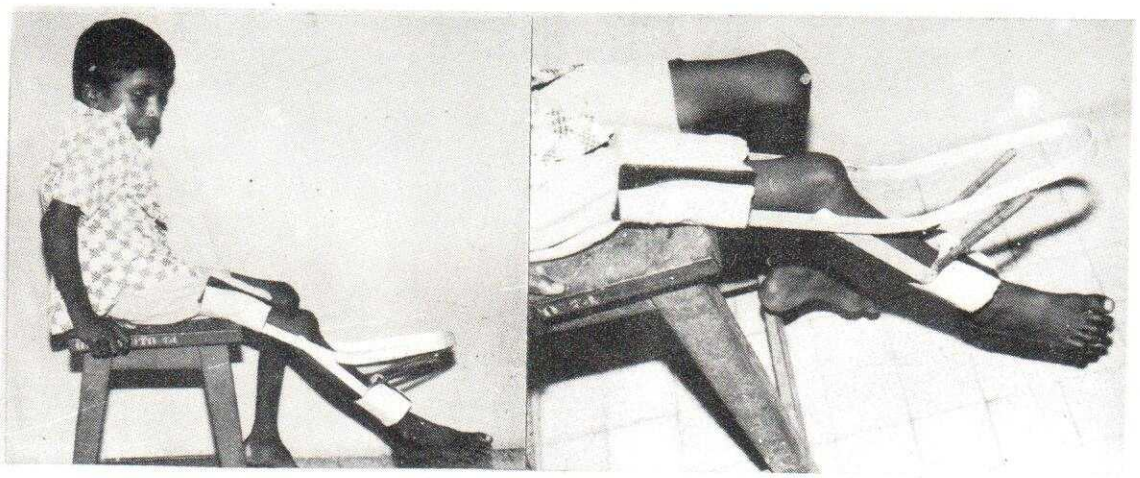

Fig. 3: Splint in use following knee Surgery.

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RIGHTS OF HANDICAPPED CHILDREN

DR. A.K. AGARWAL*, DR. O.P. SINGH** & DR. V.P. SHARMA***

GLOBAL SITUATION :

Convention on the Rights of the child aims to set universal standards for the defence of children against neglect, exploitation and abuse. The provision of the convention apply to three basic areas of children's rights i.e. survival, development and protection

Convention recognizes the right of access to health care services like immunization and oral rehydration therapy, to adequate standard of living like food, clean water and a place to live etc. Convention contains provisions relating to the child's right to education, to rest and to freedom of expression etc. Some of the provisions of convention are designed for protection in various circumstances like mentally or physically disabled children, refugees or parentless children etc.

According to Dr. Hiroshi Nakajime, Director-General of World Health Organisation,"We must recognise that most of the world's major health problems and premature deaths are preventable through changes in human behaviour and at low cost. We have the know-how and technology, but they have to be transformed into effective action at the community level." Parents and families, properly supported, could save two-third of the 14 million children who die every year- if they were properly informed.

Immunization, in particular, has been the most dramatic public health success story of the last decade. If coverage had remained at 1977 levels, then approximately five million young children would have died in the last one year from vaccine-preventable disease. However, actual mortality was under 3 million. Further, there are an estimated one and a half million children, walking, running and playing normal in rural surroundings of developing world today who would have crippled by polio, were it not for the immunization efforts of the last decade.

Children are the most important national resource, where proper development must be a top priority in our nation building programme. Unicef pointed out several years ago, that it is the children of South Asia and Africa who are among the most neglected in the world. South Asia is the home of 1/5 of world's population, which means that of all the regions in the world, the child population in this region is also the largest specially since this is the area which has highest population growth rate. This is also the area where poverty is endemic.

SITUATION IN INDIA

Child population (below 15 years of age) in India is estimated at over 270 million which comes to about 40% of the population, out of which, 48%

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of our population living below poverty line. There are 129.60 million children who require active State and community support to realise the goal set up in the national policy for children adopted in 1974. This is the over all situation concerning our children. These are unfortunate children who are born with some kind of physical, mental or sensory impairments or who acquire such disablement after birth which interfere with their normal development. The number of such children is estimated to 1 in every 10 children.

A handicapped child may be considered as one who, because of a physical or mental or a chronic illness encounters difficulty in independently carrying out day to day activity in communicating with family members or in establishing contacts with physical environment.

As per WHO reports, nearly 70% of these disabilities preventable in the early childhood by immunization, proper nutrition, prevention of accidents and by proper maternal and child health delivery programme. Therefore, intervention at early stage is essential, since many of these disabilities can be prevented or reduced by special educational measures and by appropriate rehabilitation services. In many cases of deafness and blindness, the early intervention can help in maintaining appreciable hearing and vision.

Here community can play a significant role both in early detection of disabilities in children and their rehabilitation. The community includes people living together, therefore the individual participation is essential to assume responsibilities and to understand duties towards their community's development. Hence community participation has an important role in early detection, intervention, prevention and rehabilitation of childhood disabilities. Their involvement will differ from place to place and also due to various socio-cultural & environmental conditions. The community can ensure availability of proper medical care and attention for pregnant women in the first trimester in terms of assessment, adequate nutrition, immunization against tetanus and for safe delivery. The emphasis should be on locally available food material like green vegetables, with variety of mixed pulses, beans, gram, which will ensure the healthy development of child in her womb as well as when she is breast feeding the child. The community can also ensure that all the deliveries are attended by trained persons.

The existing ICDS programme aims at providing a package of services like supplementary nutrition, non-formal pre-school education to children, health education to women, immunization, health check up and referral services to children below 6 years of age with a view to provide a reasonable opportunity to every child, for survival and developing into a useful member of the society. These services are immediate intervention needed for prevention of childhood disabilities and are being provided to the community at the grass root level. The ICDS functionaries are in better position to motivate the community to understand the problem and needs of prevention in first phase so that the occurence of impairment can be reduced to minimum. In second phase, it can also reduce the occurence of disablement, where primary prevention was not available. This will bring hope and happiness in the lives of those children who unfortunately have to live with an impairment.

Similarly through National Service Scheme, educated volunteers can perform very useful task in prevention and intervention in cases living in urban slums.

District Rehabilitation Centre Scheme launched by Ministry of Social Welfare is another milestone in the development of comprehensive

rehabilitation services for the disabled. Under this scheme as a pilot project, 12 districts have been chosen where individual block has been identified and with the help of grass root workers of ICDS project, various services like prevention, intervention, early detection have been envisaged.

It is praiseworthy to consider the rights of these unfortunate handicapped children alongwith normal children. This is one category amongst other who suffer most due to various factors, namely ignorance, lack of proper infra-structure and other resources which are essentially required for integrated comprehensive Rehabilitation programme. I consider it my profound duty to highlight following facets of handicapped children which are significant for their physical, social, educational and vocational development.

1. Prevention of Disability
2. Early detection
3. Prompt management
4. Aids and Appliances
5. Ambulation/Transportation
6. Education
7. Vocational Training and placement
8. Social integration

1. Prevention of Disability :

As per WHO estimate, nearly 70% of all the disabilities are preventable by immunization proper nutrition, prevention of accidents and by proper maternal and child health care delivery system. Each child should be completely immunised. The majority of childhood disabilities are due to lack of vaccination, malnutrition, accidents and due to improper and inadequate care of pregnant women. It should be the duty of all who have a concern for the welfare of children and as a matter of right of the child, these basic facilities are to be provided in the community. Under universal immunisation programme, Government is taking keen interest and has laid down the required infrastructure even in rural areas. With the help of various methods of mass communication, community awareness should be created, so that people may come forward for availing the facilities. The community participation is the most important aspect for the success of the immunisation programme in a developing country like India. However there may be some short comings in implementation of the U.I.P. but with proper coordination, help and support the benefits of the programme can reach to unreached. This will help in prevention of occurence of impairments in the community and in turn will help in promotion of health.

2. Early detection:

When due to any reason, the prevention of impairment is not available to the community then the impairment in child leads to disability. Now at this stage it is essential to do early detection of impairment so that the progress of disability in a particular child can be reduced to the minimum. This again requires community awareness. Presently though Aganwari workers of Integrated Child Development Scheme (ICDS), children under six years of age are being looked after for their physical, nutritional, educational and social development. In an another programme of Government of India i.e. District Rehabilitation Centre scheme which is a pilot project for comprehensive rehabilitation of all types of disabled, the work of early detection has been started at block level with the help of Aganwari worker of I.C.D.S. In nearly 12 districts the DRC Project has been started and the early results are very encouraging. We hope, in VIII five year plan, the DRC project will be started in more districts.

This is one of the finest project, wherein all types of disabled are being identified, screened and individual rehabilitation programme are being made. I feel it is not only Government but non-government organisations should also come forward to help in early detection. International agencies like Unicef has also contributed in early detection of childhood disabilities among urban poor and in slums. Unicef had sponsored a project with Chetna, (Institution for mentally handicapped), for providing such services in the urban slums. The project was itself a success wherein Consultants from Medical College were providing their expertise and guidance to the disabled children living in the slums.

3. Prompt Management:

Early detection and intervention are to be dealt together, in order to reduce the impact of impairment among the children. This requires proper referral services from Primary Health Centres to District Hospitals and to the places of excellence in the field of disability. These services are being provided in the DRC project. Proper treatment involves not only Government sector but also private medical practioners.

4. Aids and Appliances:

This is one of the important aspect of the Rehabilitation. Our majority of disabled are not able to afford these aids and appliances. Therefore Government of India has started a scheme under which these aids upto 3,000/- are provided free to poor and needy disabled having income below 1200/- per month. We are able to provide these Rehabilitation aids to large number of disabled free under the scheme. However this scheme required more and more publicity in rural areas so that benefit of the scheme can reach to periphery. As a matter of right every handicapped child should get free aids and appliances.

5. Ambulation :

Ambulation is very essential for proper exposure to external world. The certain architectural barriers like lack of ramps in public places e.g. parks, stations and schools etc. makes it difficult for a handicapped child to negotiate his wheel chair. Through law, we must remove these barriers for free mobility of the handicapped children. Although Ministry of Railways and Aviation have made special arrangements for the transportation of the disabled but still more awareness is required among other departments.

6. Education :

Without Education, the complete development of a handicapped child is not possible. NCERT has envisaged new scheme namely P.I.E.D. for the handicapped children. State Government has also started schools for the physically handicapped but still more inputs are to be put in development of educational programmes for the disabled. State Council for Education Research and training should evolve the strategies for education in collaboration with Department of Education. Although some reservation is available to handicapped in University, Medical & Engineering Colleges, but this is not enough. We have to provide proper facilities for them, including removal of architectural barriers in the schools etc. as well. More coordination and cooperation is required for integrated education system since our resources are meagure. NGO should also come forward in this field and they require more liberal financial assistance.

7. Vocational Training and Placement :

Every handicapped child should have a right for vocational training for independent living. State Government and various NGOs have started the vocational training for the disabled. Nationalized banks are also providing loans on minimum

interest for self employment of the disabled. These facilities are not able to reach to the disabled who are living in the remote areas. Though mass communication atleast this information can reach to the rural areas.

8. Social Integration

Ultimately we wish that every handicapped child should have social integration among his family and community. Family must accept him as a part and parcel of the family. This requires dignity, self respect and independence not only in the activities of daily life for making him a useful member of family, but to make him an asset to the community and Nation. Every handicapped child should have a right to live in a meaningful manner in his family wherein he can also contribute towards development and progress of the nation.

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Shortcomings in the Management of Patients with Spinal Injuries in a General Hospital of Delhi

DR. B.K. DHAON*, Dr. R.S. JAIN**, Dr. R. KUMAR ***

This study, presents the results of management, of patients with spinal injuries, admitted in an orthopaedic unit, of a General hospital. A total of 73 patients with neurological deficit, were admitted, during the period of 18 months from July 1989 to December 1990. It was found that, during an average stay of 7.4 weeks in the hospital, the patients had a very high rate of mortality as well as major complications. Results of this study highlight the pressing need, for setting up specialised centres, to provide the required high level of care, to bring down the morbidity and mortality in such patients.

Patients with spinal injuries constitute a large number of inpatients, in the orthopaedics department of a general hospital. This study was started with the objective of analysing the effectiveness of management of such patients in the set up of a general hospital.

MATERIAL AND METHOD

Between July 1989 and December 1990, 73 patients with neurological deficit due to spinal injuries, were admitted in one orthopaedic unit, of the LNJP hospital, attached to the Maulana Azad Medical College, New Delhi. A standard proforma was used to note down the details of various aspects of management during their stay in the hospital.

OBSERVATIONS

Table I : Distribution Regionwise

S.No.	Region	No. of Cases
1	Cervical	45
2	Thoracic	12
3	Lumbar	16
	TOTAL	73

Table II : Extent of neurological deficit at admission

Region	Complete	Incomplete
Cervical	19	26
Thoracic	5	7
Lumbar	7	9
TOTAL	31	42

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Table III: Major Complications

	COMPLICATION	REGION		
		Cervical	Thoracic	Lumbar
1.	DEATH	10-(22.2%)	Nil	Nil
2.	BED SORES	19-(41.8%)	6-(49.8%)	9-(56.3%)
3.	CHEST INFECTION	23-(50.6%)	Nil	Nil
4.	URINARY TRACT INFECTION	31-(68.2%)	8-(66.4%)	12-(75%(
5.	CONTRACTURES	16-(35.2%)	4-(33.2%)	6-(37.5%)
6.	PSYCHIATRIC	34-74.8%)	8-(66.4%)	10-(62.5%)

Table IV. Extent of Recovery

REGION	EXTENT		
	Complete	Incomplete	None
Cervical	2(4.4%)	15(33%)	28(62.6%)
Thoracic	0(0%)	6(50%)	6(50%)
Lumbar	0(0%)	6(37.5%)	10(67.5%)
TOTAL	2(2.7%)	27(36.9%)	44(60.4%)

DISCUSSION

From the observations the following facts emerged.

1. The number of patients with neurological deficit following spinal injuries, being admitted in general orthopaedic unit is very large.

2. Rate of major complications as well as mortality is very high. Extent of recovery during the hospital stay, is minimal or none. Only 2.7% of the patients in the present study had complete recovery.

The reasons for latter as can be derived from our study are two fold

a) Outside the hospital
b) Within the hospital

Outside the hospital, initial management of the patients is poor. Initial immobilisation as well as transportation is inappropriate.

Within the hospital, following are the factors resulting in poor prognosis

a) Shifting of patients is frequent, as all the investigation facilities are not available bedside . Besides, the patients have to undergo three to four transfers, before reaching the final bed, where they will stay for rest of the duration in the hospital. The facilities for transportation are

inadequate. All this, aggravates the already serious injury.

b) Good quality inbed radiographs are not available. Moreover the radiographers are not trained to deal with such patients, so the patients are mishandled during the procedure.

c) Turning of the patients is not regular. Technique of handling, is not correct. This is due to the lack of adequate number of trained personnel as well as materials like air mattresses, air rings, pillows etc. Result is a high incidence of bed sores, 46.5% in the present study.

d) Indwelling catheters are used, as there is lack of trained personnel to institute the practise of intermittent catheterisation. Rate of urinary tract infection is 69.8%, in the present study. Moreover, the infecting organisms are mostly resistant strains of gram negative aerobes.

e) Inadequate facilities for physiotherapy of chest, limbs and bladder result in high rates of chest infection and joint contractures viz.50.6% and 35.6% respectively. Most of the patients end up being dependant on indwelling catheters for rest of their lives.

f) Intensive care facilities are poor, resulting in a very high rate of mortality.

g) Facilities for special investigations like myelography and computerised tomography are not readily available. Most of the patients who could be taken up for surgical decompression after these investigations are thus denied this benefit.

h) Facilities for vocational rehabilitation, are not available. Most of the patients are forced to lead a dependant life.

It is obvious from the observations that the general hospitals are not adequately staffed or equipped to tackle these injuries.

CONCLUSION

In this continuing study, it is clearly emerging, that in a general hospital, the future of a patient with spinal injury is bleak. In view of the large number of such patients being received and mismanaged in the general hospitals, it is imperative that specialised spinal injury centres be set up urgently, to provide the level of care which these patients deserve.

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Role of Besan Paste in the Home Management of Bell's Palsy

Dr. Nonica Laisram*, Dr. R.K. Srivastava**

25 cases of Bell's Palsy were taken up for study to find out the role of besan paste in the home management of these cases. The application of besan paste in the cosmetic world is well acclaimed for its role of facial massage and for toning up the facial muscles. Its application in the management of Bell's palsy in the acute stage is studied here. Regular application of besan paste in addition to medicines, exercises, oral and ocular precautions, showed satisfactory results.

Facial paralysis in Bell's palsy is an entity commonly encountered in our day to day OPD practice. Management in the acute phase consists of massage, fomentation, exercises for facial muscles, vasodilators, steroids, care of eyes and oral hygiene, supplemented with multivitamins. Facial splints for Bell's palsy with residual paralysis are available. A simple and effective splint to maintain and improve the tone of the facial muscles is essential in the management of Bell's palsy especially in the acute stage. In our study, we have used besan paste as a facial splint with successful results.

MATERIAL AND METHODS

25 patients of both sexes in the age group 10-35 years attending the Rehabilitation OPD during the period January, 1977 to February, 1989 with a clinical diagnosis of Bell's palsy (average duration of illness 1-7 days) were studied to find out the results of application of besan paste as a facial splint and massage in the home management of facial paralysis. The patients were taught to make a paste of besan (gram flour) of thick consistency by mixing besan and water (2:1) and apply the paste over the affected part of the face, with finger strokes in upward and outward direction. The paste is allowed to dry in the position which minimises drooping of the paralysed muscles, kept for a period of 25-30 minutes and then washed off with warm water. The procedure was repeated twice daily in the initial two weeks, followed by daily application in the subsequent weeks of therapy. Simultaneously, patients were given lines of treatment which includes drugs, exercises, electrical stimulation, massage, ocular and oral hygiene. Patients were followed up every 2 weeks for a periodof 2 months.

RESULTS

Of 25 cases, 4 cases carried out only home therapy, using besan paste regularly as advised. These 4 patients did not receive electrical stimulation at any time. They showed complete recovery at the end of 2 months. The rest of the 21 cases did regular therapy both at home and in hospital. Of these, 12 cases showed 100% recovery, 9 cases showed approximately 75% recovery.

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TABLE : RESULTS OF THERAPY IN 25 CASES OF BELL'S PALSY

	Treatment regime	Recovery (at end of 8 weeks)	Total No. of cases
1.	Besan Paste & Standard regime (without electrical stimulation)	Complete	4
2.	Besan Paste & Standard regime & Electrical stimulation	Complete	12
3.	-do-	Partial (75% recovery)	9

DISCUSSION

Besan paste is easy to make and inexpensive. The procedure is simple and is easily taught to patients for use at home. Besan paste when dried maintains the tone of the muscles and prevents further sagging of the paralysed muscles thus acting as an effective facial splint. The process of applying paste in itself acts as a useful massage for the weak muscles. The local vasodilatation which results from massage and the effect of warm water used for washing off the paste, supplements the action of vasodilators and causes increase in local circulation. In our study, the 4 cases who recovered without electrical stimulation, could not receive electrical therapy as they could not come to the hospital either due to domestic problems or because their homes were situated very far away.

Role of splints to prevent stretching and contractures in Bell's palsy with residual paralysis is well documented. An additional advantage with besan paste is that it can be readily applied and used for all effected areas of the face, whereas the other splints are applicable in preventing drooping of only the lower part of the face. The use of besan paste as a media for toning up muscles is widely used for cosmetic purposes. Its application in facial muscle paralysis in our study has shown equally optimistic results. It is suggested that besan paste splint and massage should be used in the management of all cases of Bell's palsy for a better therapeutic outcome.

Study on the Usefulness of Lower Limb Orthosis In Spinal Cord Injury Patients

DR. V.P. SHARMA*, DR. A.K. AGARWAL**, & PROF. U.K. JAIN***,

In last two years, 31 lower limb orthosis were fitted. Dorsal level paraplegics have used orthosis for exercise purposes only, while lumbar level paraplegics have used for community level ambulation as well.

Spinal Cord Injury patients have been reported to be successful in ambulation with leg braces[4]. But there is high rate of non- usage of braces varied from 32 to 59% (2,5,7,8,9)

Age, level of injury, duration of injury and other physical features are important factors in determining the orthosis usage.

This study has been planned to determine the usefulness of orthosis in Spinal Cord Injured patients along with various physical and social factors in our situation.

Method & Material

In last two years (1990 & 1991), 31 lower limb orthosis were fitted in paraplegics for ambulation, who were admitted in Spinal unit of Department of Physical Medicine & Rehabilitation, K.G. Medical College, Lucknow. Detailed followup study was done including level of lesion, age, ambulation status and their response towards orthosis.

Rancho Los Amigos Hospital criteria (Hoffer etal 1973), Hussey and Stauffer (1973) for functional level of ambulation were used for follow up regarding ambulation status i.e., community ambulation, house hold-ambulation, non functional ambulation (exercise ambulation) and non ambulation.

Observation

Out of 31 paraplegics, 3 cases were less than 20 years of age, while 21 cases were between 20-30 years age group with an average age of 24.19 years. 7 paraplegics of thoracic level were using KAFO for exercise purposes only (Table No.I). Mostly patients of T6 & T7 lesions were wheelchair dependent, for them the orthosis was used only for exercise ambulation. These 7 non-ambulators discontinued the use of the orthosis for ambulation within 6 months after fitting of the brace & only one patient of T10 lesion was using the orthosis for exercise ambulation (Table No. II).

Paraplegics (complete and incomplete) who were below L1 and L2 level, continued to use orthosis regularly for ambulation. They were using their orthosis for community ambulation as well.

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Non use of orthosis was not related to marital status, education level & employment status etc.

Discussion

From the follow up study, it was observed that higher frequency of non usage of Lower Limb orthosis in spinal cord injured patients.

Age, Level of injury and severity of SCI are the important factors in determining the ability of functional ambulation. Patients with injury above T12 level could hardly get functionally significant ambulation while injuries below L4 level could get better ambulation with those appliances. (2,8,9)

In the present follow-up study, lesions above T9 or higher have not used the orthosis for ambulation. The energy cost of ambulation for paraplegics is related to the level of the lesion, and is extremely high at the level higher than T12[1]. This is probably the main reason why high level paraplegics are not able to use orthosis for ambulation continuously.

Nativig and MC Adam (1978) in their 10 years follow up study of 27 paraplegics with complete lesion (T1-T10) observed that 20 patients were able to climb 20 stairs with crutches and 19 patients were able to make 100 meters. It indicates that the patients were younger and their ambulation programme was much more extensive.

Coghlan etal (1980) observed that age, physical status and ADL level were related to the use of braces. The high energy expenditure of paraplegic ambulation does not allow elderly and sick patients to ambulate. They prefer wheel chair more then orthosis. It is more so practically difficult to bear and taking out orthosis for which mostly they are dependent on others.

In an another follow up study of past, the common reasons given by the paraplegics were that brace makes them too slow, too difficult to too unsafe (Coghlan etal 1980). In our situation patients having dorsal lesions do not prefer orthosis as it is too cumbersome and unsafe, hence prefer wheel chair for their ambulation (Table No.III).

The upright position prevents complications like osteoporosis, pressure sore, spasticity and urinary complications, Nativig and MC Adam (1978). For maintaining the upright posture paraplegics prefer a pair of posterior splints as it is easier to use and of light weight.

Present study has demonstrated that younger patients of lumber lesion prefer to use braces for ambulation while dorsal lesion and elderly paraplegics prefer wheel chair for their ambulation and ADL activities.

Table No. I: Status of Spinal Cord Injury versus Type of Brace.

Level of Injury	KAFO	AFO	Total
Thoracic Level	7	0	7
Lumbar Level	20	4	24
Total	27	4	31

Table No. II: Status of Ambulation

Ambulation	At the time of fitting of caliper	Follow up
Community Ambulation	4	4
House hold Ambulation	20	18
Exercise Ambulation	7	1

Table No.III: Reasons for non use of brace

- Unsafe	6
- Not practical	1
- Muscle spasm	2
- Other reasons	2

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A Clinical Study on Role of T(E)Ns In Primary Fibrositis Syndrome

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A total of 20 patients diagnosed as fibrositis syndrome have been selected from an out-patient rheumatic clinic of a State Hospital. All the patients have been subjeccted to Transcutaneous electrical nerve stimulation therapy in a routine way. Excellent results have been obtained in 80% cases. No side effects have been noticed.

The Transcutaneous Electrical Nerve Stimulation or T (E) NS is application of pulsed rectangular wave current directly over patient's skin surface by surface electrodes. Such low frequency currents of small intensity (0 to 60 m A, guide : Tingling sensation with or without feeling of pins or needles) are applied over the greatest intensity of pain or trigger points for reducing and removing pain in chronic pain syndrome. The electrical paresthesia to decrease or control pain first appeared in 1914 (Burchlow 1919, cited by Mannheimer), and became modified as many companies in various countries started manufacturing this device in different models. However it was Mannheimer (1984) who gave T (E) NS uses and effectiveness in the International perspectives in Physical therapy. The method is getting place as a physical therapeutic agent due to its advantage that it is simple to use and it is a small portable unit which the patient himself can apply directly over the painful area.

Soft tissue rheumatism or non articular rheumatism, according to Stockman (1940), is a condition of chronic inflammation of white fibrous tissue of the fascial aponeuroses, sheaths of muscles and nerves, ligaments, tendons, subcutaneous tissue, occurring in all parts of the body, and giving rise to pain, aching, stiffness and other symptoms. Fibrositis is such a condition presenting with local pain, tender fibrous nodules (some times fibrous bands in subcutanceous tissue or within muscles).

The aim of this study is to evaluate the role of T(E) NS in a series of patients suffering from fibrositis syndrome, in a crowded out - patient's department of a State hospital.

Hence psychological assessment of these patients was also felt necessary.

Material and Method:

20 (twenty) cases of primary or Idiopathic soft tissue rheumatism were chosen from the Rheumatology clinic of Physical Medicine department of R.G. Kar Medical College, Calcutta, for study, after completion of their necessary pathological, radiological investigations, and diagnosed as Fibrositis. Full psychological assessments were done in all the cases. Then they were subjected to T (E) NS therepy, 30 minutes

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daily sitting. Ten sittings were considered as one course of treatment and review was done after every course. As & when necessary treatment was continued upto 2,3 or 4 courses. This study was carried out from January 1989 to June 1989. i.e. for a period of six months, and all the cases were followed for another 3 months, and the results were tabulated after the month of september 1989.

The criteria for assessment of results were:

I. Excellent

1. Pain relieved with two courses (i.e. 20 sittings of therapy).
2. No discomfort, No local tenderness.
3. No relapse within 3 months after complete relief of symptoms.

II. Good

1. Pain relieved in three or four courses (i.e. 30 to 40 sittings of therapy).
2. No tenderness, no discomfort.
3. No relapse within 3 months after complete relief.

III. Fair

1. Pain relieved within four courses. (i.e. within 40 sittings of therapy)
2. No tenderness, but slight discomfort persisting.
3. Relapse of pain occurred within 3 months period, and one more course of therapy given to get complete relief, and no more relapse within next 3 months.

IV. Poor

1. Pain not completely relieved even after completion of four courses.
2. Tenderness persisting.

V. Side effects

1. Drowsiness.
2. Exaggerated pain response.

Observation

Table-I

	Age in years	No. of Patients Female	Male
A.	Below 15	NIL	NIL
B.	16-20	3	NIL
C.	21-25	10	NIL
D.	26-30	5	2
E.	Above 31	NIL	NIL
	TOTAL	18	2

Table-II:
Site of Fibrositis

	Site	No. of Patients
A.	Interscapular region	12
B.	Lower Cervical	3
C.	Lumbar (Low back trunk)	1
D.	Supra spinatus	4
	TOTAL	20

Table-III:
Results of Psychological Assessment.

Mental Status	No. of Patients Female	Male
Free	2	NIL
Not Free	16	2
TOTAL	18	2

Table-IV:
Results of Treatment

No. of Patients			Female	Male
A. Excellent	16	80%	14	2
B. Good 2	10%	2	NIL	
C. Fair	1	5%	1	NIL
D. Poor	1	5%	1	NIL
TOTAL	20		18	2
E. Side effects	NIL			

Discussion:

From table I it is evident that fibrositis syndrome is common in Females, and in the age group 21 to 25 years. From table II it is evident that the most common site of fibrositis is interscapular region. From table III it is evident that in most of the cases, the mental status is not normal. Only 2 cases (out of 20) have been declared psychologically free by the psychologist.

There were only 2 male patients in this series and both of them showed excellent result by this therapy. There were 18 female patients, out of which 14 showed showed excellent results, and good, fair and poor were 2,1 and 1 respectively. Thus T (E) NS is an excellent method of therapy to provide analgesia, without change of psychological state of the body, in fibrositis syndrome, showing 80% excellent results, and 10% good results and 5% fair results. Only 5% of cases showed poor results. There is also no side effects.

Good results so far as analgesia is concerned, have been reported, following T (E) NS therapy in chronic pain syndrome (Ebersold et al (1975), Loeser et al (1975), but the mechanism by which pain is removed or controlled is not clear. The gate control theory (by predominating A-Fibre input carrying touch, pressure, thermal stimulus and inhibiting C-Fibres-a physiological mechanism to close the gate to pain at substantia gelatinosa of dorsal column of spinal cord) may be a possible explanation. Similarly counter irritation, conduction block, neuro humoral liberation theory etc. are not definitive to strongly support their views. However, the complete discussion is available in the study of Mannheimer et al (1984) where the cutaneous stimulation has been shown to inhibit release of substance P, a neuro-transmitter needed to promote propagation of pain stimuli.

However this method cannot be considered a treatment modality for specific treatment. But it can surely assist in one phase of rehabilitation programme which is concerned with pain control.

SUMMARY:

A total of 20 patients diagnosed as fibrositis syndrome have been selected from an out-patient Rheumatic clinic of a State hospital. All the patients have been subjected to Transcutaneous electrical nerve stimulation therapy in a routine way. Excellent results have been obtained in 80% cases. No side effects have been noticed.

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Schooling Handicap's In Disabled Children

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160 disabled children were interviewed at Department of Physical Medicine and Rehabilitation, K.G. Medical College, Lucknow. 41.7% disabled children were found handicapped in schooling and were not attending school inspite of their school age. 76% of disabled children are deprive of schooling due to disability alone. 64% disabled girls were not attending the school. Regarding schooling, parent's view were inadequate facilities for disabled children within their reach, (86.2%) lack of transportaton facilities, (91.25%) God's curse (57.5%), and the rest (33.1%) did not comment for schooling of their children.

Disablement is unforeseen event in terms of agony, suffering and frustration to victims, the family and the community. When the child is the victim, these related problems increase manyfold specially in their mental, physical, social development due to deprivation of schooling. Nearly 70% of disabilities are preventable (WHO Report, 1981). Only preventive measures can save atleast five million children a year from mental and physical disablement (Sunder Lal, 1986).

Every child has a right to attend school. It is the responsibility of the family, community and society to provide all infrastructural facilities to the children, normal and handicapped, to undergo schooling for their comprehensive physical, mental and social development. Special attention is required to handicapped children so that these neglected children can have the advantage of school environment.

Handicapped child encounters difficulties in indepdently carrying out day to day activities, in communicating with family members or in establishing contact with physical environment. If intervention occurs in time, many of these disabilities can be prevented or reduced through special educational measures and rehabilitation or preventive services. Apart from various reasons for drop out in school as seen in normal children too, it is a major problem in disabled children which leads to social burden to family and society especially in the case of girl disabled, which warrents for the special attention.

MATERIAL AND METHOD

The present study has been conducted at the Department of Physical Medicine and Rehabilitation, K.G. Medical College, Lucknow. Orthopaedically handicapped children below 14 years of age were interviewed alongwith their parents, who attended out- patient department and registered for follow-up. Data was recorded on pretested schedule and analysed accordingly.

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OBSERVATION AND DISCUSSION

Poliomyelitis (56.2%) was the main disease leading to disability followed by Congenital Talipes Equino Cavo Varus (16.2%). Disability was noticed more in male children than female (Table-I).Agarwal, A.K. et al 1991 reported in his study that post polio. residual paralysis in 58.7% of cases. Paccaud (1979) reported 70 to 80% Poliomyelitis victims in three countries i.e. Africa, Middle and Southern America and Asia. Almost similar report was published by WHO in 1979. Similar incidence was also reported by Project on Childhood Disability by Baroda Citizens Council, 1983-88.

It was noticed that 58.3% children were attending school being in school age, inspite of their normal milestone development i.e. 89.4%. The State of World's children (1992) has reported that 99% children were enrolled in Primary School during 1986-89). Although schooling facilities are available but disability becomes the barrier for schooling. Enrolment of disabled girls was found only 25% of disabled male children. The State of World's children 1992 further reported that 73% female as a percent of males were enrolled in Primary School. This gross difference shows apathy towards girl child and were towards disabled one, as well as frustration of parents towards disability. 76% of children were unable to attend school on their own efforts due to disability in which majority 63.1% were female disabled. 24% children could not attend the school due to indifferent attitude and other reasoning which also forced 66% girl disabled not to attend the school (Table-III).

It was noticed that inadequate schooling facilities for disabled child within reach (86.2%) as well as transportation facilities (91.25%) were the major constraint for schooling in view of the many father of disabled children which warrants community/voluntary organisations as well as Goverment machinery to come forward and to reach to these disabled. Still father's view towards schooling is related to God's curse (57.5%) which again warrants the Health Educationist, Anthropologist, Psychologist to take care of this vulnerable group. 33.1% father's did not specify any reason for schooling of their children, could be motivated and rehabilitational services to be provided to them (Table-IV).

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Table-I :Diseases Leading to Disability in Children

Diseases leading to disability	Male No.	Female No.	Total	%
Poliomyelitis	52	38	90	56.2
Congenital Talipes Equino Cavo Varus	16	10	26	6.2
Rickets	3	4	7	4.0
Amputation	1	-	1	0.6
Congenital Bilateral Hyper Extension at Elbow	1	-	1	0.6
Cerebral Palsy	7	4	11	6.9
Pes Planus	2	2	4	2.5
Hemiperesis	1	2	3	1.9
Others	12	5	17	10.6
Total	95	65	160	100.0
Percentage	59.4	40.6		

Table-II: Schooling and Milestones in Disabled Children

S.No.	Milestones	Schooling				Total	%
		Yes		No			
		M	F	M	F		
1.	Normal	26	7	60	50	143	89.4
2.	Delayed	2	-	6	8	16	10.0
3.	Not known	-	-	1	-	1	0.6
	Total	28	7	67	58	160	
	Percentage	17.5	4.4	41.9	36.2		100.0

Table-III: Reasons for not attending Schooi

S.No.	Reasons	Male No.	Female No.	Total	%
1.	Not of school age	58	42	100	80.0%
2.	Disability	7	12	19	15.2%
3.	Parent's indifferent attitude towards disability	1	2	3	2.4%
4.	Others	1	2	3	2.4%
	Total	67	58	125	
	Percentage	41.9%	36.2%		

Table-IV: Father's views towards Schooling of Disabled Child

S.No.	Views of parents	No. of patient	Percentage
1.	Inadequate schooling facilities within reach	138	86.20
2.	Transportation facilities not available	46	91.25
3.	God's curse	92	57.50
4.	No Comment	53	33.10

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