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Percutaneous Release of Trigger Fingers: Is it reserved for a few Surgeons?

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Abstract

Symptomatic trigger fingers are painful and disabling. When conservative management fails, surgery is the treatment of choice. Percutaneous release of trigger finger was performed in 38 patients as an out patient clinic procedure using a # 11 blade in the Department of Physical Medicine and Rehabilitation with 84.2% success. Haematoma, infection of tendon sheath and hypoaesthesia due to injury to the digital nerves were the complications encountered. The technique is simple, reliable and effective.

Introduction

Stenosing tenosynovitis is a group of conditions in which there is a mismatch between the size of the tendon sheath and the tendon which passes through it. The trigger finger, a type of stenosing tenosynovitis, is caused by a nodule or thickening of the flexor tendon which catches on the proximal edge of the first annular pulley (A1) when the finger is actively flexed[1]. When severe, finger may lock in flexion, requiring the patient to use the other hand to release the finger. The catching and locking is often painful and interfere with hand activities. Though the natural history indicates a self limiting disease[2], a prompt treatment is often required to relieve pain and also to lessen the interference in activity. Local injection of steroid is often recommended[3,4,5]. Although injection is simple with low morbidity, this has a high rate of failure and repeated injections may be required6. When conservative treatment fails, open release of A1 pulley is usually recommended[6]. To reduce morbidity and cost of open release method and also to permit out patient surgery in clinics, subcutaneous release of the trigger finger using a #11 blade have been tried and the results are reported here. Not many reports on this procedure are available in the country.

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Material and methods

Patients of trigger finger(s) who attended the Department of Physical Medicine and Rehabilitation, Regional Institute of Medical Sciences since January 2000 were the study population. So far, 152 patients have been enrolled till December 2001. Patients who had been treated earlier with surgery, had history suggestive of infection following local injection, systemic diseases like diabetes, hypertension, excessive subcutaneous tissue, fixed trigger finger, local infective problems were excluded from this study. Patients who had been treated earlier for more than 4 months with NSAID, local steroid injection (minimum of two injections) and physical therapy like ultrasound therapy, but failed to produce a functional recovery were eligible for the study. Thus 38 patients were included in this study out of 152 patients. Subcutaneous releases of the trigger finger were performed in these 38 patients. However, disease characteristics were also being described here for the whole study population to compare with other series.

Operation was conducted under peripheral nerve blocks (28 patients) or local anaesthetic infiltration (10 patients) with 2% lignocaine without a tourniquet. Involved hand was cleaned with antiseptic solutions. Trigger nodule was identified. Finger was hyper extended to displace neurovascular bundles to the sides on the dorsal aspect. A # 11 blade was inserted just distal to the nodule and cutting was done and free movement of the finger was checked. In release of trigger fingers, dissection of A1 pulley proceeds from proximal to distal. In case of trigger thumbs, the entry point of incision is just distal to the nodule over the proximal phalanx, and division of annulus proceeds proximally[7]. A grating sensation could be felt as the knife cuts through the horizontal fibers of A1 pulley. This grating sensation ceases when the pulley is completely divided. When the knife does not move with the flexion of the finger tip, it indicates adequate depth of the blade. If there was residual catch, the same procedure was repeated until flexion/extension movement of the finger was free. A compression bandage was put for about 8 hours. Then, the bandage was replaced by a water proof band aid and active movement of the finger started. Actual operative time was less than 1 minute. Patients were reviewed on the next day and checked for the free movement of the finger, sensation and other post operative complications like bleeding, hematoma, etc.

Here we are reporting the results of the first six months follow up with three contacts at one week, three months and six months. Follow up is still continuing. Results were recorded as complete relief when there were no symptoms and complications; partial relief when there were residual symptoms in the form of triggering or pain or complication less disturbing than the previous symptom; and no relief when no improvement in symptoms or more disturbing complications than the previous symptoms were present.

Results

There were 14 males and 138 females who had trigger fingers. Among the 38 patients who underwent surgery, there were 4 males and 34 females. Distribution of the trigger digits are shown in table 1. Thumb was most commonly involved followed by middle finger. Peripheral nerve block was partial in 6 cases. Complications due to local anaesthetic were not reported. Local anaesthetic infiltration frequently distorted anatomy thereby causing difficulty in locating the nodule.

Thirty two patients got complete relief and another four got partial relief. Two patients had no relief with surgery. Three patients with partial relief and another 2 patients with no relief were seen amongst trigger thumb patients. Post operative complications like hematoma (1), infection of the tendon sheath (2 cases) and hypoesthesia due to injury of digital nerves of thumb (2 cases) were encountered.

Four patients (3 partial and 1 complete reliefs) developed symptomatic trigger finger within 2-5 months. They were treated with open release. Adhesion was noted in 2 cases, incomplete release in 3 and a distal nodule in one case.

Table 1. Distribution of digits among 152 patients.

Fingers/Digit	*Side of trigger digit/finger*		*Total*
	Right	*Left*	
Thumb	45	46	91
Index	6	6	12
Middle	38	30	68
Ring	4	0	4
Little	5	1	6

Table 2. Treatment outcome of 38 patients.

Outcome	Number of patients	Percentage
Complete relief	32	84.2
Partial relief	4 (all thumbs)	10.5
No relief	2 (all thumbs)	5.3

Discussion

The aetiology of stenosing tenosynovitis is unclear, but a repetitive trauma does appear to play a role[1]. Sampson[8] found fibrocartilage metaplasia on the inner surface of the A1 pulley which was the cause of the triggering. A tendon nodule, as a bunching up of the spiral fibers of the flexor tendons at the site of constriction in the fibrous flexor sheath may be found[9]. It is most common in the ring and long fingers and rare in index finger[1]. Sanjib[10] reported that thumbs and ring fingers are most frequently involved. This present series showed thumbs as the commonest digit involved followed by middle finger and ring finger. Surgical release has good success rate of 83% but significant complications have been noted [11]. If finger is locked in flexion or extension, open release is the choice[12]. Several techniques for percutaneous release of the A1 pulley have been described with satisfactory results and few complications. Sanjib[10] reported 73.5% complete relief with percutaneous release using a 21 gauge hypodermic needle similar to that described by Eastwood et a[l9]. However, Ha[13] pointed out that the needle bent easily and the tip did not readily divide a thickened pulley. Satisfactory results with complete relief of triggering were achieved in 93% of the digits using a specially designed Korean HAKI knife[13] without any nerve injuries in 185 digits including 79 thumbs. In the present study complete relief was noted in 84.2%. Ha[13] recommended that a patient with acute triggering is probably best managed by an injection of steroid but when it fails, percutaneous release is the treatment of choice. Several authors have indicated that the proximity of the digital nerves in the thumb poses a considerable risk of injury when the percutaneous technique is used [9,14,15]. Sanjib[10] reported a high chance of digital nerve injury (37%) in thumb. At the same time, Thorpe AP[11] reported that digital nerve injury is the most frequently reported complication of the trigger finger release by open method. We came across 2 patients with hypoesthesia following the procedure. However both the patients regain normal sensation within 3 months. Injury to flexor tendon has also been described as a complication of the percutaneous technique [9,12,14]. We tried to avoid this complication by cutting the A1 pulley only after checking absence of mobility of the knife during movement of the finger. Routine use of a tourniquet is not required because blood loss due to this procedure is very minimal. The procedure is best performed under peripheral nerve block(s) because local infiltration often distorts anatomy.

Conclusion

A physiatrist who failed to relieve trigger finger by all conservative measures should go for percutaneous release unless there are contraindications. This procedure that gives an instant result is not so difficult to be reserved only for the experienced and careful hand surgeons. The advantages of this procedure like reduced morbidity, low cost and an OPD procedure should be made available to all physiatrists without fear. This procedure is simple, reliable and effective.

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Advantages of Ischial Weight Bearing Immediate Post Operative Prosthesis

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Abstract

This study was conducted to clinically assess a new prefabricated immediate post operative prosthetic design patented in the U.S. The prosthesis has ischial weight bearing proximal contact socket which reduces the pressure and shear over the stump, thus avoiding the stump complications. It has the added advantages of being adjustable to anthropometry and can be used for transtibial, through knee and transfemoral amputations. It is easy to adjust and fit, patient can don and doff as and when required and is reusable. Twelve patients, who were fitted with the prosthesis reported decreased complaints of pain, phantom sensation etc. None developed wound dehiscence or other stump complications. It was used as early as post operative day one and all of them walked on the same day of prosthetic fitment. Its use was limited to hospital premises and the design was acceptable to the patients.

Introduction

Early ambulation after amputation has enormous benefits on the functional & psychological outcome in lower limb amputees. They include reducing risks of immobility such as aerobic deconditioning and contractures and avoiding complications like pain, oedema, muscle atrophy etc. It thus accelerates wound healing. Postural reflexes are maintained and the patient does not 'forget' walking until definitive prosthetic fitment, with added psychological benefits. Immediate post operative prosthesis thus hastens overall rehabilitation[1].

There have been many attempts to achieve early post amputation ambulation, the first of which was rigid plaster of paris casting of the stump on the operating table with pylon attachment, proposed by Berlemont[2-4]. Some of the other models were;

- early walking aid for geriatric amputees with polythene, padded leather or metal sockets (Devas, Thomson)[5-7],
- pneumatic post amputation mobility aid (PPAM)[8-11],
- simple pylon of copper tubing and tripod base (Harrington et al)[12] and
- prefabricated plastic limbs[13], to mention a few.

All these models had total contact, end weight bearing sockets which produced shearing and stress forces on the amputated residual limb, leading on to complications like delayed healing and wound dehiscence and hence felt into oblivion.

At the Deptt. of PMR, AIIMS, New Delhi, we conducted a prospective study to clinically assess a new prefabricated immediate prosthetic design, patented as Durga prosthesis in the U.S.A. which is adjustable to patient's build and height and is easy to apply[14-16].

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Material and Methods

Device studied: The prefabricated immediate lower limb prosthesis has a polypropylene, quadrilateral ischial weight bearing socket, which is open distally. The socket is adjustable in anteroposterior and mediolateral dimensions. It has a modified silesian band suspension. There are adjustable metal uprights extending from side walls of the socket to SACH foot. There is an automatic locking and manual unlocking knee joint allowing sitting on a chair with bent knee. Patients can don and doff their prostheses themselves (Fig. 1,2).

Inclusion Criteria

- Transtibial, through knee and transfemoral amputees
- Above 12 years of age
- Within ten days of amputation
- Any cause and type of amputation
- Sound mental status
- Informed consent

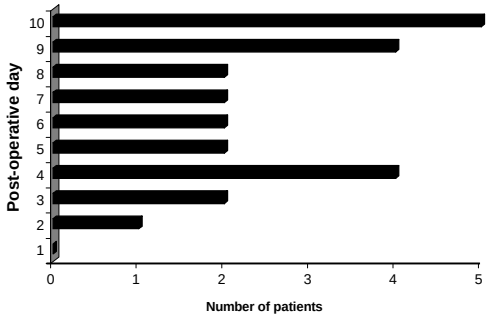
Exclusion Criteria

- Short transfemoral (less than 7 inches) stump
- Long transtibial stump
- Associated medical conditions detrimental to patient's early ambulation
- Associated upper extremity conditions affecting use of a standard walker
- Sensory deficit in gluteal or perenial region of amputated extremity
- Unwillingness to take part in study.

Procedure

After bandaging the amputated residual limb, a foam dressing was applied to it. The prosthesis was adjusted to patient's measurements and then fitted. Patient was made to stand and after final adjustments, the fit of the ischial seat was confirmed. Patient was then taught weight shifting on alternate lower limbs and then walking with assistance of a standard walker (Fig. 3).

Fig. 3. Time of Prosthetic Fitment



IMMEDICATE POSTOPERATIVE ISCHIAL WEIGHT BEARING LOWER LIMB PROSTHESIS

Fig. 1: Front View

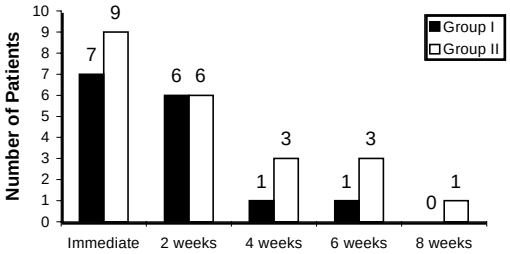
Fig. 2: Lateral View

Observations and Results

Out of the twenty four consecutive lower limb amputees studied, twelve successfully ambulated with immediate prosthesis and we considered them as group I. The procedure had to be abandoned in the other twelve (group II).

The average time of prosthetic fitting was 6.7 days after amputation (Fig.4).

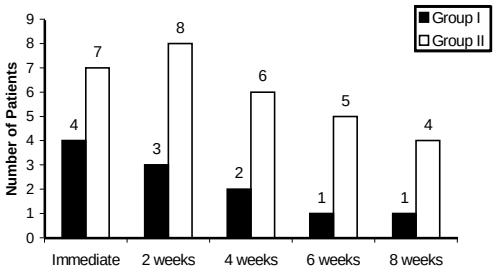
Fig. 4 : Pain



The total distance walked varied according to individual patient and at the end of the study those who completed the programme could walk for time periods varying 30 minutes to 120 minutes at a stretch without any complaints. All of them walked on plain surface without any difficulty and seven out of twelve patients (58.3%) could walk on uneven surface as well. A young male negotiated up and down stairs with his transfemoral immediate prosthesis.

We noticed that patients in group I had decreased incidence of pain as compared to those in group II who did not ambulate with immediate prosthesis (Fig. 5).

Fig. 5: Phantom Sensations



A reduced incidence of paraesthesiae, phantom sensations, phantom pain and discolouration and oedema of the stump were also noticed (Fig. 6, 7, 8).

Fig. 6. Phantom Pain

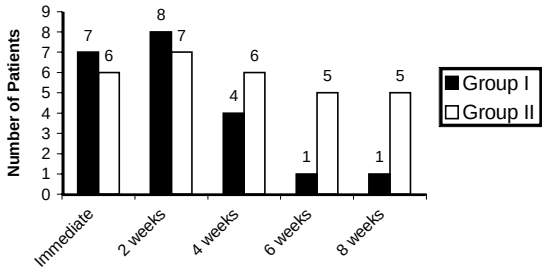


Fig. : 7 Paraesthesiae

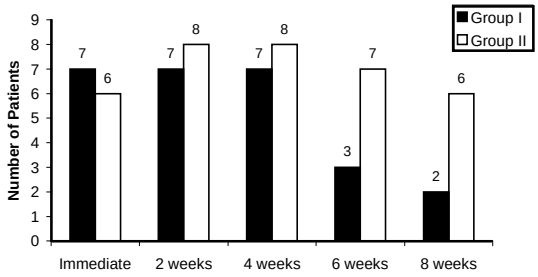
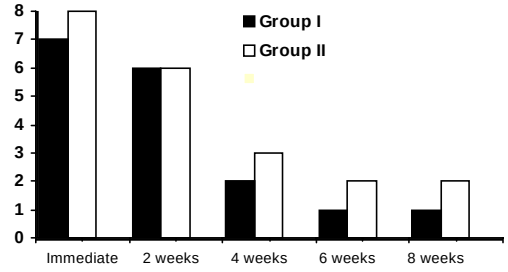


Fig. : 8 Odema And Discolouration



A statistical significance could not be arrived at due to the small population studied. None of the patients had wound dehiscence or excessive stump soakage in either groups. Only one transtibial amputee in group II who was amputated for vascular disease and had an ulcer on the anterior

aspect of the knee, developed a knee flexion contracture.

The prosthetic design was made to western standards and many of our patients could not use it because the socket was too loose. This was the reason for abandoning the trial in 9 patients of group II. We did not alter the adjustability in socket which could have been done. Two patients had excessive pain in the limb and were unable to co-operate and one patient had a conversion reaction during the procedure.

Discussion

The present study was conducted in 24 consecutive lower limb amputees in immediate post amputation period. Knutsson and Stahl[4] were of the opinion that only those patients who were walking before the amputation, at least with stick could ambulate postoperatively as well. However, in our study, all the patients who had successful trial walked on the same day of prosthetic fitment irrespective of their pre-amputation ambulation status.

The classical technique of immediate post surgical prosthetic fitting necessitated meticulous care in application of the rigid dressing, alignment of the pylon and foot and in prosthetic gait training, requiring a skilled and dedicated prosthetic team to achieve optimum results and to minimize complications[13,17]. It also needed frequent changes of temporary sockets which placed an extra burden on an already over burdened workshop[4]. The new prefabricated design is in stark contrast to this, being easy and simple to apply with adjustability provided in itself.

Immediate postoperative prosthesis once applied was static, caused variable and unpredictable pressure on the wounds and the surgeon could not observe or palpate the wound instantly. Though the pneumatic devices allowed wound inspection, all of them provided total contact equal pressure throughout the stump with intimate fit [5-7]. There also was the potential risk of inflation pressure causing tissue necrosis[18-20]. The study design bypassed weight through the amputation stump and thus removed any pressure or shear on it, allowing wound inspection as and when necessary.

The amputees who satisfied the inclusion criteria were fitted with the ischial weight bearing proximal contact immediate postoperative prosthesis after applying foam dressing over the bandages. It was ensured that no pressure or excessive pain was felt at the stump end or suture line and that the ischial seat was confirming to the ischial tuberosity. Initially, patients were taught to shift weight on alternate limbs and then bear weight on the affected limb. After making sure that no pressure was felt at the residual limb with total weight bearing, patients were allowed to walk as much as they could, with assistance of a standard walker. This differed from the classical teaching of IPOP which graduated from touch down weight bearing in the first few days to 25 to 50% of body weight, measured by bath room scales[21], where the enthusiastic often ended up with complication. Some authors advocated weight bearing only after suture removal1[9,22-24]. Such a problem did not occur with this design as the stump end was free and secure within the prosthesis. A standard walker was used always to prevent any imbalance, inco-ordination, fear of vertical position or trauma or fall should they occur.

In the group where trial was abandoned, nine out of twelve were due to an ill fitting socket despite maximum adjustments. No attempt was made to increase the slot provided in the socket which could solve the problem.

In our series, patients who ambutated with immediate post operative prosthesis had lesser incidence of pain, paraesthesiae, phantom sensation and phantom pain, as compared to those without. The values were statistically non significant due to the small sample size studied.

Many authors [5,23-25] have described reduction in phantom pain and other complications with early ambulation which was also observed in our study.

No patient had wound dehiscence or excessive stump soakage. Warren and Moseley[26], Golbranson et al[22], Cohen et al [17] and Kane et al[27] reported incidence of stump complications and wound dehiscence in vascular amputees who practiced immediate ambulation with rigid dressing.

Mark[28] objected to the tendency of joint-less limbs to produce an awkward gait and Slocum[29] expressed his concern about immediate post operative prosthesis with a stiff knee producing faulty gait patterns at a later date. This was found not to be true in this series. All amputees, whether transfemoral, through knee or transtibial, walked with a stiff knee in the immediate prostheses. Their definitive prostheses had knee movement and no gait abnormality was detected in any of them. Thorpe et al[30] could not directly attribute any gait abnormality to the use of a pylon.

All patients in group I accepted the new prefabricated prosthetic design. They did not express too much of concern on walking with a stiff knee and none had any fear of falling. This was in accordance with the opinion of Kay and Pennel who found that some preferred a stiff knee which was more stable and provided no fear of falling [31].

A peg leg or pylon protruded when the patient sat down, which was cosmetically displeasing [32]. The disadvantage was overcome in the design studied by a manually unlocking knee which provided flexion in the prosthesis when patient wished to sit down. Such a provision with hinges to allow manual control for sitting and standing was found in the "early walking aid for elderly amputees" developed by Devas[5-7].

A high degree of self esteem was observed in all the patients who were fitted with IPOP. Though all our patients were apprehensive about their ability to walk again without a part of their leg, the visual feedback in front of a mirror, thus seeing themselves standing and walking again, boosted up their morale. This is in accordance with the opinion that "the best use of immediate prosthesis is the psychological benefit". Golbranson et al felt that the intensity of immediate ambulation programme decreased the incidence of post amputation depression[22].

Limitations & Recommendations

Our study, with a total of twenty four amputees was limited in its sample size. This was in view of the limited clinical experience prior to this. Moreover, due to the restricted availability of the design and prior clinical knowledge, the prosthetic use was confined to hospital premises.

We propose a larger clinical trial including use of prosthesis at home. It is also recommended to increase the adjustability in the socket which alone would make the prosthetic application possible in a larger number of patients.

Summary and Conclusions

A new prefabricated immediate prosthetic design was clinically assessed in 24 lower limb amputees. The prosthesis has ischial weight bearing proximal contact socket which reduces the pressure and shear over the stump, thus avoiding stump complications. It has the added advantage of being adjustable to anthropometry and can be used for transtibial, through knee and transfemoral amputations. It is easy to adjust and fit, patient can don and doff as and when required and is reusable.

Twelve patients had successful trial of the new immediate prosthesis and they walked with assistance of a standard walker on the same day of prosthetic fitment. A decrease in incidence of pain, paraesthesia, phantom sensations and phantom pain were noted in them. Out of the other twelve, the reason for abandoning the procedure was a

large socket in spite of maximum adjustment in ten patients as they were extremely thin. Other two had stump and psychological reasons.

We found that the use of immediate post-operative ischial weight bearing prosthesis was feasible in our setup. Minor adjustments in the modular socket measurements need to be done to enable thin built patients to be accommodated.

The design concept was largely acceptable and no serious complications like wound dehiscence or delayed healing as seen with the other immediate post-operative prostheses were seen with this. Its use improved patients' morale and needed no sophisticated prosthetic techniques. It was simple to use and adjustable to each patient. High level of satisfaction and self esteem were reported in patients who had a successful immediate prosthetic ambulation.

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A Case of Spinal Cord Injury with HIV, Hepatitis-B Infection: Ethical & Rehabilitation Issues

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Abstract

Spinal cord injury associated with HIV and hepatitis-B infections is unusual. These two infections adversely affect the functional outcome of already disabled person. Exercises increase the lean body mass, muscle strength and CD4 count. We present the case of a girl with spinal cord injury, who also developed HIV and Hepatitis-B infections through blood transfusion. We discuss the ethical and rehabilitation aspects.

Key Words: Spinal Cord Injury, Ethics, Disability, Rehabilitation, Exercises, HIV, Hepatitis-B.

Introduction

Inspite of the Law for mandatory blood screening in India, incidence of HIV and Hepatitis-B due to blood transfusion is increasing. According to National AIDS Control Organization (NACO), there were 3.86 million persons sero positive for HIV at the end of year 2000. That is highest in the world. Out of 20,304 AIDS cases, 805 (4.16%) are reportedly due to blood or blood products. Exercises have a great role in endurance building and improving quality of life in these patients. AIDS with Spinal cord injury has been previously reported in a homosexual man[1]. We report a spinal cord injury case infected with HIV and Hepatitis-B infection due to blood transfusion. To our knowledge this is the first case report of this kind from India.

Case Report

A 14-year-old Indian girl, resident of UP came with complaint of weakness in both lower limbs and inability to control urine and stool for 2 1/2 months. There was a history of trauma to spine by sliding of mud over her body near her village. She was brought to a private hospital where MRI of spine was done. MRI revealed fracture L1. She was initially managed by non-surgical methods for a week. Later she was referred to other hospital for spinal fixation. Spinal fixation was done after 10 days of injury and she received 2 units of blood, which was brought from a private blood bank. After 3 weeks she was discharged from the hospital. 1 ½ month after surgery there was no change in neurological status. Her parents brought her to AIIMS for further treatment. She was admitted in PMR ward. On examination she was found to have complete paraplegia with motor & sensory level of L1 with ASIA-Class A. She had a grade 4 pressure sore in sacral region and she was on indwelling catheter for neurogenic bladder. Functional Independence Measure (FIM) score was-46. Initial routine investigations were normal except ESR 45/1st hour.

She was on rehabilitation programme including upper limbs strengthening exercises; Tilt table standing and wheelchair transfers. She learned bladder training with clean self-intermittent catheterization (CSIC). After 1 month of admission she developed abdominal discomfort,

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vomiting and fever. Urine culture sensitivity was done and reported E-coli>10^5/ml and sensitivity to ciprofloxacin, which was given for complete course. She was treated with the same for fever and UTI. In the 2nd month of admission she developed a mild icterus, urine was positive for bile pigments & salts. LFT were repeated next day, which came Total Bilirubin-3mg%, SGOT-673 IU, SGPT- 681 IU, and ALP-590 IU. Inspite of antibiotic therapy and bed rest her fever persisted. After 5 days repeat liver function tests were repeated total bilirubin 4.4mg%, SGOT-1155 IU, SGPT-824 IU, ALP-406 IU. Further investigations revealed she was positive to HbsAg and HIV. CD4 count was 1979 cells/microlitre.

Her LFT came to normal after 8 weeks, during this period she was on bed rest. Rehabilitation program was started with upper limb strengthening exercises with pushups and dumbbells. She continued clean self-intermittent catheterization. She was able to walk with B/L axillary crutches and B/L HKAFO. Her pressure sore in sacral region healed completely. She was counseled for future marriage & sexual life and advised on how to take precautions in day-to-day activities to prevent the spread of infection. Because of her normal CD4 count we didn't start any antiretroviral therapy. She was discharged at the end of five months in the hospital. At the time of discharge her LFT was SGOT-39IU, SGPT-37IU, alkaline phosphatase-114IU and FIM score was 113, in comparison of 46 at the time of admission.

Discussion

Spinal cord injury associated with HIV, Hepatitis-B infection was first reported by Meythaler JM et al in 1988[1]. In his report a homosexual man who developed quadriplegia due to injury by a small caliber pistol. The common presentation in this patient and our patient is fever of unknown origin.

According to 1993 revised CDC classification system it is difficult to classify spinal cord injury patient for staging of HIV. Infection with HIV causes progressive ultimately fatal illness characterized by depletion of CD4 count, muscle wasting, fatigue and depression. Spinal cord injured patient have already got disability, associated HIV infection in the same patient causes additional disability by decreasing muscle power, which interferes in the ADL. At the time of first medical contact, 9% of HIV infected individuals and 22% of AIDS patients require assistance in ADLs. Child may be isolated due to barriers from the caregivers, therapists, and hospital staff due to incontinence or fear regarding the disease. Misconceptions regarding the disease in school also makes child isolated and give a blow to the education. Stress due to traumatic injury and additional stress due to disease retard the growth of child. The disease also isolates the parents/ dependents socially, psychologically and economically. In this case patient was allowed to share a common ward with other patients and advising her to take necessary precautions to prevent the spread of infection.

La Perriere et al reported increase in CD4 count following aerobic exercise training with asymptomatic HIV-1 males, whose CD4 count is in normal range[2]. Lox et al reported moderate intensity aerobic exercises have been shown to significantly increase CD4 cell counts among asymptomatic HIV infected individuals[3]. Muscle mass is a major determinant of strength and thus of functional capacity and disability. In HIV patients because of wasting of muscles there is loss of lean body mass. The only physiological intervention known to increase lean mass, muscle mass and strength is progressive resistance exercises. A study done by Ronenn et al suggests that progressive resistive training has the potential to increase strength and lean mass in-patients with HIV infection[4].

The Supreme Court of India had banned paid blood donations by the end of 1997 and established the National Blood Transfusion Council to look for the safety of blood[5]. Still a high incidence of (8.2%) HIV was observed in blood donors. A study conducted by Pandav et al estimated the annual loss of economy due to HIV population in India to be 3447 billions[6]. In conclusion it is very essential to ensure safety of blood in treating a spinal injury patients.

In conclusion although patient required complete bed rest for few weeks we did not observe any progressive neurological deficit. Strict enforcement of laws concerning blood banks to prevent spread of infection is needed to prevent such cases in future. Rehabilitation programme and community participation helps to overcome physical and mental illness due to the disease. Progressive resistive exercises, aerobic exercises, energy conserving ADL modifications, psychological and sexual counseling along with drugs can add life to years and also years to life of HIV patients.

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Management of Upper Limb in Cerebral Palsy - Role of Surgery.

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Abstract

Forty six patients with cerebral palsy (hemiplegic and diplegic) aged from five to twenty one years had surgical procedures for the upper limb to increase functional status of hand. All the patients underwent various surgical procedures depending upon the necessity . The mean age is of thirteen years .(five to twenty one years) IQ of all the patients were more than seventy .Forty one out of forty six patients felt there was an improvement in function . Range of movement in the fore arm and wrist were also increased in most of the patients . Thumb in palm deformity was completely corrected . Resting position towards neutral and stability of hand were also some of the achievements of surgery. There was improvement in different functional grasps. The management of upper limb in cerebral palsy is a challenge. But in properly selected patients there is some improvement in functional status.

Key Words : Upper limb - Cerebral palsy - Role of surgery.

Introduction

Neonatal intensive care units are saving more children of lower gestational age and lower birth weight than previously , and these children are more likely to have birth injuries or prenatal defects than are other children , there by increasing the cerebral palsied population. [1]

A majority of those with involvement of the upper limb are adequately handled by occupational therapists by developmental therapy and bracing. Probably fewer than 4 % of patients with hands disabled by cerebral palsy can be benefitted by surgery. But, because of the general feeling that the results of surgery in cerebral palsy is poor , many patients have not been considered for surgery . If we recognize that some improvement of hand function may aid the patients to a marked degree in ADL , then the correct place of surgery will be established.

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Typical pattern of spasticity in upper limb includes elbow flexion , pronation of the fore arm , ulnar deviation and flexion of the wrist with thumb in palm deformity . Each individual case must be carefully evaluated and when indicated surgery can be extremely beneficial . It has been seen that ideal candidate for surgery is a spastic hemiplegic , who is co operative , IQ more than seventy and has a pattern of grasp and release are so functional that the hand is useful to some extent. Hoffer et. al [10] believed that adequate cognition was important and suggested that patients with IQ less than seventy must be carefully selected. Thometz and Tachjian [11] showed that in patients with IQ less than seventy , improvement in functional capacity was less. The hand should be sensitive. Because upto 50 % children with cerebral palsy have significant deficit in sensibility. 2 It has also been reported that 30- 97 % of patients have defective steregnosis . Steregnosis also affects the outcome of surgery .

The technique of surgical reconstruction of the upper extremity in cerebral palsy are well established. [3,4,6,7,8,9]

We report the results of surgery in forty six patients who had reconstructive surgery of upper limb in spastic cerebral palsy.

Material and Methods

Forty six patients with cerebral palsy (hemiplegic and diplegic) under went various types of surgical procedures for upper extremity from 1995 to 2001. There were twenty six males and twenty females . There were forty hemiplegics and six diplegics. Out of forty hemiplegics right side was involved in thirty three cases and left side in seven cases. A total number of fifty two hands were operated and two hundred and five operations were done. (Table I) Our youngest patient was five years and eldest was twenty one.

TABLE- I : **OPERATIVE PROCEDURES**

NAME OF OPERATION	NUMBER
1. Fractional lengthening of biceps tendon	17
2. Flexor aponeurotic release	32
3. Rerouting of pronator teres	29
4. Fractional lengthening of flexors of fore arm	5
5. FCU > ECRL/ ECRB	21
6. FCU > ED	13
7. Release of adductor policis	33
8. PL > EPB	15
9. PL > APL	7
10. BR > APL	6
11. Release of first dorsal interosseous	25
12 Excision of head of radius	2
Total	205

The patients were selected after evaluation of IQ (70 or more) . Cases with moderate degree of spasticity were selected for surgery. Athetoids were not included in our study . All patients had some type of physical therapy before surgery . No medicines were used pre operatively to reduce spasticity . Different grips and grasps were assessed pre operatively and were compared with that of post operative cases. (Table II) Various movements like that of elbow extension , supination of fore arm, wrist dorsi flexion and thumb in palm deformity were compared post operatively. (Table III)Different ADL were assessed post operatively to confirm the post operative functional improvement.

TABLE II : ASSESSMENT OF GRIP/ GRASP PRE-OPERATIVELY AND 6 MONTHS POST OPERATIVELY

	Pre operatively Present	Post operative (6 month) improvement
1. Chuck grip	8	32
2. Five finger pinch	13	26
3. Power grasp	17	32

TABLE III : IMPROVEMENT OF RANGE OF MOTION

Type of motion	No of Cases	Unchan-ged	Improved	In degrees
1. Elbow extension	17	1	16	10-30
2. Supination	29	5	24	10-80
3. Wrist extension	37	8	29	5-60

Results

There was significant improvement in active elbow extension , active supination and grasp at six months post operatively in forty one patients. Five showed no improvement. Chuck grip was improved in twenty four patients, five finger pinch in thirteen cases and power grasp in fifteen cases. (Table II) There was improvement in ROM in elbow , forearm and wrist joint. (Table III) Thumb in palm deformity was completely corrected in thirty one out of thirty three cases. Thirty five patients out of forty six patients were able to hold glass, do buttons and handle objects confidently. None was made worse. Twenty five patients out of forty six were able to eat independently with some difficulty who were being fed by parents. Ten out of forty six were able to write in the

operated hand . Style of letters of hand writing improved dramatically with more follow up. The operated hands were not compared with the normal hand. They were compared with the improvement of function of same hand.

Fig. 1 Pre-operative

Fig. 2 Post operative

Almost all felt that there was some improvement in function, cosmoses, or overall improvement . Hands having severe flexion deformity of wrist and hand were unable to clean the palm which improved post operatively, Only unsatisfied are those who were having greater expectations.

Discussion

Reconstructive surgery of the spastic upper extremity in cerebral palsy can be a most challenging one. Techniques and principles for the various procedures are established. [3,5,6,7] In our series most patients were of hemiplegic type. Most patients showed improvement of hand function which were maintained upto six months to four years. Thumb in palm deformity was completely corrected in most of the patients. The reconstruction included division of origin of adductor policis and partial release of first dorsal interosseous. Position of thumb was reinforced by transfer of brachioradialis and palmaris longus to abductor policis longus tendon. The results were compared with that of L.B Dahlin et. al [8] and results were found to be comparable.

Flexion and pronation deformity is not only a functional disability but also cosmetically displeasing. We have done lengthening of biceps, rerouting of pronator teres, flexion aponeurotic release and transfer of flexor carpi ulnmaris to ECRL/ ECRB which improves elbow extension , active supination and dorsiflexion deformity. Rerouting of pronator teres was also used to improve supination. Supination gain was compared with that of Sakellarides et. al [7] . ROM of wrist was compared with that of L.B Dahlin et al.[8] and T.M Wolf et al. [9]. Correction of pronation increased two handed activities, because forearm pronation interferes with the ability to get the palms together. One of our patient was having bilateral superior radio ulnar dislocation probably due to long standing pronation contracture . We excised both the head of radius and then tendon transfer performed.

The level of intelligence may affect a patients co operation, training and motivation. Patients with IQ seventy or more were selected for surgery by Hoffer et. al [10] . After his study he concluded that adequate cognition was important

and IQ less than seventy must be carefully selected. So we have not tried the procedures in cases having less than seventy. It is also very difficult to get the co operation of parents due to lack of education and low financial status. Frequent visit or long duration stay in hospital is necessary. So, family counselling and mental status of child should be assessed thoroughly in our country before under taking the procedures.

Though any appropriate age is not selected for surgery , still it is reasonable to wait until the child can actively participate in post operative therapy. Green and Banks [3] recommended that surgery should not be done below the age of seven. But , it is patient dependent. Our youngest patient was of five years old. But it is reasonable to wait until the child actively participate in post operative therapy. It is seen that good results are obtained in patients who are hemiplegic , IQ more than seventy and the patients were able to perform some of the activities in the same upper limb.

Motivation of the patient and family is a very important consideration . Longer duration of hospitalization and therapy is mandatory in these cases. Patients should not be given high hope. Parents should be explained in detail about the procedure and about expectation of the results.

Patients were asked to demonstrate different ADL post operatively . The hemiplegic extremity could be used as a support in these activities in most of the patients . Surgery also improves the pattern of eating , propelling wheel chair etc. in diplegics.

Appropriately selected patients for surgery in upper extremity show some improvement in functional status. In our series most of the patients felt that there was a definite improvement in some sort of function.

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Occult Problem in Paraplegia - A case report

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Presented herewith is a case of Traumatic Paraplegia in which the neurological status was not agreeing with the functional outcome achieved. The investigations into the causation of the condition revealed an occult problem: sexuality issues.

Introduction

In any spinal cord injury rehabilitation setup paraplegics present with many a problems to be taken care of. Sexuality and concerns about it are some of those issues that are often ignored or left for future. This attitude is not conforming to the holistic rehabilitation program, where comprehensive rehabilitation is the goal. It has been observed that if talked into this aspect, 70% do talk freely.1 One such case is reported here where myth and beliefs related to sexuality was the causative factor for paraplegia and hindered the ultimate rehabilitation. Holistic rehabilitation approach to details of clinical history, problems leading to the occurrence of anatomical diagnosis and the remedial measures by the physiatrist led team is highlighted in this report.

Case Report

A 35 years old male presented with fracture L1 vertebra with bilateral fracture calcaneum with incomplete paraplegia of two years duration, following fall from a height, treated conservatively elsewhere. Motor system examination revealed reduced muscle tone, power in the hip extensors and abductors were in the range of 2+, knee 3 and ankle in the range of 2+ with associated stiffness of the ankle movements. He could not get up from sitting to standing by himself, but was able to walk with crutches if made to stand. Stress incontinence of the bladder was present. The patient was worried about achieving normality of lower limbs. He was in a dilemma about whether further investigations and possible surgery could cure him. He looked depressed and was hardly communicative. The relatives of the patient were ready to do anything including getting surgery done in a centre abroad. The patient was engaged and the family wanted to know if he could get married under the present condition. Initial advice to the patient consisted of working up the lower extremity muscles, to mobilize the stiff joints, achieving independence in activities of daily living to achieve better physical independence. Advice about decision for marriage was deferred initially for a period of about two months. In the six weeks period, the patient worked hard, muscle power improved to 3 to 3+ in lower limbs, improved his gait with crutches, was able to get up independently but with difficulty, did not report erections though signs of presence of semen in the urine were present. He was sent to sexual guidance clinic in psychiatry but was lost for follow up for about 3-4 months after that.

He came back about six months later with the same physical status as he had left us after about 6 weeks of intervention in our department. At that moment, he was scheduled for surgery in a private hospital where he was given the hope of recovery after surgery. He wanted to know if he should go

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ahead for surgery over there or not. At this stage he was counseled against surgery and told that it may not help him achieve full cure as he was thinking and besides there was no indication for surgery at the end of two and a half years. The patient did not proceed to the private hospital for surgery and decided to continue treatment in our department. The patient was depressed further though he had the will to work hard. He was more anxious about his marriage because the pressure from the girl's side was mounting up to get married early. While asked about his treatment in sexual guidance clinic, he was very reserved and did not want to go back there. Efforts to build up further physical reconditioning was not fruitful to get rid of crutches after further two months though muscle power improved by about one in all the muscle groups making it about grade 4.

Sexual counseling session conducted by us in the department of PMR with the patient revealed old habit of masturbation and depression due to feeling of guilt for having indulged in masturbation, which that patient thought could have caused weakness in his sexual abilities. The proposal for marriage arranged by parents aggravated the fear and depression as he felt that habit of masturbation could mar his sex life after marriage. In such a depression he attempted suicide by jumping from the roof of a building leading to paraplegia.

The working diagnoses reached after sexual counseling session (S.C.S.) with the patient were that the myth about masturbation lead to fear of inability to perform after marriage leading to killing of sexual desire leading to suicidal attempt and paraplegia, but recovery from paraplegia was masked by the conversion reaction. Plan of management after S.C.S. was to continue repeated counseling only for his sexual problems while continuing strengthening of lower extremities and gait training. Patient was kept in total confidence though the actual diagnosis reached was not revealed to the patient. He was asked to work on and report any psychological erections. After repeated boosting of morale, clarifying the unfounded basis for myths related to masturbation and sexual performance and counseling, the patient reported weak erections. He could not masturbate but no advice on masturbation was stressed, therefore, status about ejaculation was not known. Keeping in view the moral code, he was not advised to have a try at the pre-marital sex with the fiancee. The pressure about marriage was further mounting on him. With these guidelines in mind, the patient was asked to go ahead for the marriage with the advice to report after marriage for further counseling with the partner for problem sorting.

Soon after the above decision, the patient started showing dramatic recovery and could walk with only one stick instead of two crutches, in a period of two weeks.

The patient along with the partner reported the day after the marriage. He came walking independently without any walking aid with near normal gait pattern. During the counseling session understanding about the condition of the patient to the partner was stressed. The patient was instilled with confidence to go ahead and try sex play including intercourse. The spouse was guided on the techniques to maintain arousal in the patient. During the early post marriage period patient reported semi-erections and pre-mature ejaculation and inability to penetrate, on which the patient was further counseled to take this as a usual yardstick in most marriages or sexual relations. Two weeks after marriage following repeated efforts, coitus was achieved and the patient had a co-ordinated ejaculation. In the following two menstrual cycles and active sex life, pregnancy was achieved. At the time of writing this report, they are the proud parents of a six years old daughter. The patient runs a shop, has mild stiffness of ankles and no apparent physical weakness.

Discussion and Conclusions

Studies pertaining to the sexuality of the disabled from this part of the world are almost nonexistent.[2] The disabled themselves have a negative self-concept and a low self-esteem and this affects their attitudes towards sexuality and their sexual behavior. Health care professionals tend to neglect this issue perhaps due to their insensitivity to the sexual needs for the disabled or a lack of understanding and expertise in this area. Attitudes and misconceptions of the public need to be corrected. Sexual rehabilitation needs to be incorporated as part of holistic medical rehabilitation program.[2] Stiens[3] emphasized interdisciplinary person-centered rehabilitation, and success of the individual in chosen life roles and proposed a module to update SCI issues reviewed in past syllabi.

Every worry of the patient needs to be honoured while working in rehabilitation. While ascertaining the cause of paraplegia, each and every aspect of the etiology needs to be thought about. Unfortunately, patients as well as the doctors and other care givers do not like to discuss the sexual issues at the first instance. White et al,4 in a series of 79 spinal cord injured (SCI) men reported that with respect to eleven other areas of life, sex life ranked the lowest in terms of satisfaction and fifth in terms of importance. Of the sample, 67% reported having had a physical relationship (not necessarily including intercourse) in the past 12 months. From among seven topics related to sexuality, the three in which there was greatest interest were methods and techniques to achieve sexual satisfaction, helping a partner cope emotionally with limitations on sexual activity and ability to have children. Alexander[5] noted that many physicians and allied health care workers responded to patients' sexual concerns with dismissal or reassurance at the exclusion of emotional aspect of sexuality. In another community based study by Ide et al [6] 102 subjects indicated that the provision of information regarding sexuality should remain a high priority for health care providers.

Siosteen et al[7] in a study on 73 SCI subjects found more than half of the subjects (57%) rated their sexual relations after injury as satisfying or at least rather satisfying. The study further suggested that sexual information and counseling should be integrated in the total care of the SCI patient to reduce the negative effects on sexuality, caused by the injury. Similarly Evans et al [8] suggested a multidisciplinary sex education program with specific recommendations for content, which should be included in the information-giving counseling process.

In a study on 49 partners of SCI, Kreuter et al [9] reported, 61% appreciated the quality of their sexual relationship and most partners (84%) considered their relationship overall to be satisfying. Half of the couples engaged in sex, with or without intercourse, once a week or more. Fifty-five per cent of the partners reported being content with the frequency of their sexual interaction while one third would have wished more frequent activity. Almost half of the partners (45%) considered their current sex life to be as good as or even better than their previous sex life.

Considering the above case, if the diagnosis of paraplegia (cauda-equina syndrome) was made as only traumatic paraplegia without going into the reasons why the patient fell, understanding of the problems of the patient would not have been very clear. Here, an attempt to suicide leading to fall from height prompted further investigation into the reasons for the attempt. The reason for the suicide lead to our understanding of the basic problem related to sexual behaviour of the patient prior to attainment of disability. The problems being faced by the patient due to myths about his sexual affairs lead him to a conversion reaction despite his attaining adequate recovery physically, but still that was not apparent clinically due to this

being masked. Gunther[13] reported that (1) Socially universal sources: the demands posed by patients' regression; patients' misplaced aggression; patients' thwarting of staff's (narcissistic) professionalism; the threat of obligatory identification; staff disgust at patient's body damage. (2) Individualized sources: individual residues of caregivers' own developmental experience (conscious and unconscious) with issues such as dependency, aggression, sexuality, self-esteem and autonomy. Solutions involve understanding and mastering the distinction. Miller[10] found SCI patients had many fears and misapprehension about there Sexual functioning. Common beliefs include: (a) disabled men cannot sexually satisfy able-bodied women; and (b) cord-injured persons cannot have sexual intercourse. Such misapprehensions can be helped by the counselor's willingness to discuss sexual issues openly. Clients need a clear and accurate picture of the facts, as well as encouragement and support to help them rediscover their sexuality. Spinal cord injury does not mean sexual incapacity. Given a knowing and patient partner, most clients can enjoy a satisfying sex life. Hence S.C.S. forms an essential component of any SCI rehabilitation program. However, before such an interaction can comfortably take place, the counselor may gain from an opportunity to examine his or her own attitudes toward human sexuality and gather more information about the sexuality of physically disabled adults.[11] Anderson et al [12] presented a framework to show how different types of physical disability affect sexual function. Addressing to the patient's problems related to the underlying cause lead to the reversal of the conversion reaction and the patient could surface the optimum level of functional and clinical recovery. This could only be achieved due to problem oriented goal planning and not leaving sexual matters about the patient to others or leaving them unattended. Sexual satisfaction and feelings of self-esteem play an important role in the ability to adapt to an acquired physical disability. Sexual counseling for the disabled differs little from that for the able-bodied. However, the same principles apply. It is appropriate to remind not only the counselor but also the disabled that (1) loss of sensation does not mean loss of feelings, (2) loss of potency does not mean loss of ability, (3) loss of urinary continence does not mean loss of penile competence, and (4) loss of genitalia does not mean loss of sexuality.

We come to the conclusion that sexual perversions or sexual behaviour of the patients can be a cause of paraplegia (by conversion reaction), or can complicate the paraplegia. Sexuality issues may complicate and delay the progress of the patient even in the physical status and rehabilitation is incomplete until sexuality issues are settled.

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Pattern and Causes of Rural Based Locomotor Disabled

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Abstract

780 rural based locomotor disabled are studied to find out the pattern and causes of disability. Males are four times more than females. Paralysis of limb is maximum 55.1% followed by stiffness of joint 27.7%, loss of limb 11.7%, Kyphoscoliosis 2.8% and others 2.7%. Paralysis affects mainly one lower limb (53.3%) followed by one upper limb (15.6%), both lower limbs 14.4%, all four limbs 8.4%, one upper and one lower limb 8.1%. Paralysis of limb is mainly due to residual poliomyelitis (81%) followed by spastic cases 17%. Stiffness of joint affects mainly foot and ankle (28%) followed by wrist and hand (14%), Hip (13%), knee (11%), elbow (9%) and others. Main causes of stiffness of joints are congenital deformity (51.9%) and post traumatic stiffness (35.6%). Loss of limb is mainly due to post traumatic amputation (84.6%) and congenital limb deficiency 14.3%. Upper limb loss is more (55%) than lower limb loss (45%). In this study on locomotor disability poliomyelitis is (45%), congenital deformity (14.3%), post traumatic stiffness (10%), amputee (11.7%), spastics 9% and others 10%.

Introduction

Rehabilitation is still an under-developed services in rural areas. Even in rural Medical College there is no comprehensive rehabilitation services for disabled. In rural medical college there is no facility of orthosis and prosthesis services and Physical Medicine Departments have been dumping ground for chronically ill patients. This is probably due to financial constraints and feeling that rehabilitation services are expensive due to dependence on sophisticated machines and equipment. On the other hand, in the rural areas population explosion with large number of congenital malformed children, inability to eradicate preventable diseases like polio, leprosy etc, rapid industrialisation, mechanisation in agriculture and fast-moving traffic with increased number of accidents are increasing the number of disabled persons day by day. It is aimed to study the pattern and causes of locomotor disabled in rural areas which may be helpful to take definite measures for their prevention and to develop less costly, simple, community oriented rehabilitation measures.

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Material and Method

The study is carried out in the Department of Physical Medicine and Rehabilitation, Burdwan Medical College and Hospital, Burdwan, a rural Medical College in West Bengal, during the period from January 1993 to December 1993. All locomotor disabled irrespective of age, sex and cause, attending the department and medical board seeking physically handicapped certificates during this period, are included in the study. In each case history, clinical examination, blood test and X-ray if required are done to come to a diagnosis.

Observations :

A total of 780 locomotor disabled attended the department during the period of one year, of which 611 (78%) are male and 169 (22%) female. Maximum cases 330 (42.5%) are in the age-group

Table - 1. Showing pattern of locomotor disables in relation to age & sex

Pattern of Disables	Age in Years					Sex		
	0-10	10-20	20-40	40-60	60 +	Male	Female	Total %
Paralysis of limb	59	173	159	39	0	328	102	430
	13.7%	40.2%	37%	9.1%		76.3%	23.7%	55.1%
Stiffness of joint	11	70	101	32	2	175	41	216
	5%	32%	47%	15%	1%	81%	19%	27.7%
Loss of Limb	5	16	48	18	4	84	7	91
	5.5%	17.5%	52.7%	20%	4.3%	92.3%	7.7%	11.7%
Kyphoscoliosis	0	6	14	2	0	12	10	22
		27%	64%	9%		54.5%	45.5%	2.8%
Cured Leprosy	0	2	4	3	0	5	4	9
		22.2%	44.4%	33.4%		55.5%	44.5%	1.2%
Shortening of Limb	0	5	1	1	0	4	3	7
		71.4%	14.3%	14.3%		57.2%	42.8%	0.9%
Dwarfism	1	0	3	0	0	2	2	4
	25%		75%			50%	50%	0.5%
Achondoplasia	0	1	0	0	0	1	0	1
		100%				100%		0.1%
Total %	76	273	330	95	6	611	169	780
	(10%)	(35%)	(42.5%)	(12%)	(0.5%)	(78%)	(22%)	(100%)

of 20-40 years followed by 273 (35%) in the age-group of 10-20 years (Table-1).

Out of 780 disabled, paralysis of limb cases are maximum 430 (55.1%), followed by stiffness of joint cases 216 (27.7%), loss of limb 91 (11.7%), kyphosocliosis 22 (2.8%) and others like cured leprosy, shortening of limb, dwarfism and achondroplasia 21 (2.7%) (Table-1). Paralysis of limb is maximum 173 (40.2%) in the age-group of 10-20 years and mainly 328 (76.3%) in male. Stiffness of joints are maximum 175 (81%) in male and mainly 101 (47%) in age-group of 20-40 years. Loss of limb cases are maximum 48 (52.7%) in age-group of 20-40 years and mostly 84 (92.3%) in male. Out of 430 cases of paralysis of limb, one lower limb is paralysed in 229 (53.3%) cases, both lower limbs are paralysed in 62 (14.4%), one upper limb and one lower limb in 35 (8.1%), one upper limb is involved in 67 (15.6%) cases, both upper limbs in 1 (0.2%) and all four limbs are paralysed in 36 (8.4%) cases (Table-2). Cause of paralysis is mostly 349 (81%) poliomyelitis followed by spastic cases in 72 (17%) which include hemiparesis (23) paraparesis (21) and cerebral palsy (28) and others 9 (2%) like G.B. syndrome, motor-neurone diseases and parkinsonism.

Out of 216 cases of stiffness of joint, foot and ankle are involved in maximum cases 61 (28%) of which 21 left, 25 right and 15 are bilateral. Hip is involved in 28 (13%) cases of which 16 left, 10 right and 2 bilaternal. Knee involvement is in 24 (11%) cases of which 8 left, 15 right and 1 bilateral. Wrist and hand are involved in 30 (14%) cases of which 15 left, 10 right and 5 bilateral. Elbow involvement is in 19 (9%) cases of which 11 left, 5 right and 3 bilateral cases. Shoulder is involved in only 4 (2%) cases. The cause of stiffness of joint is mainly congenital deformity 112 (51.9%), then post traumatic 77 (35.6%), arthropathies 14 (6.5%) and others like

Table - 2 : Showing pattern of paralysis of limb cases in relation to involved limb and cause

Involved limb	CAUSE			Total
	Poliomyelitis	Spastic	Miscellaneous	%
One lower limb	229	x	x	229 53.3%
Both lower limbs	40	21	1	62 14.4%
One upper and one lower limb	12	23	x	35 8.1%
One upper limb	65	x	2	67 15.6%
Both upper limbs	x	x	1	1 0.2%
All four limbs	2	28	6	36 8.4%
Total	349 (81%)	72 (17%)	9 (2%)	430 (100%)

post burn contracture, volkmann's ischaemic contracture etc. 13 (6%) (Table-3). The distribution of loss of limb cases is shown in Table-4. Upper limb is involved in 50 (55%) cases of which right 20, left 25 and bilateral 5. Among upper limb loss cases at or above elbow loss 15 (16.5%) and at or above wrist loss 14 (15.4%). Lower limb is involved in 41 (45%) cases of which right 23, left 15 and bilateral 3. Among lower limb loss cases at or above knee loss cases are 14 (15.4%) and below

Table - 3. Showing pattern of stiffness of joint cases in relation to anatomical site and cause

	Side			Cause				
Site	Left	Right	Both	Congenital	Post Traumatic	Arthropathies	Misc.	Total
Hip	16	10	2	7	15	6	x	28 (13%)
Knee	8	15	1	5	17	2	x	24 (11%)
Foot & ankle	21	25	15	50	9	x	2	61 (28%)
Lower limb	12	7	3	11	9	x	2	22 (10%)
Shoulder	1	2	1	2	1	1	x	4 (2%)
Wrist & hand	15	10	5	13	9	x	8	30 (14%)
Elbow	11	5	3	6	12	1	x	19 (9%)
Upper limbs	6	6	1	5	5	2	1	13 (6%)
All limbs	x	x	x	13	x	2	x	15 (7%)
Total				112 51.9%	77 35.6%	14 6.5%	13 6%	216 100%

Table - 4. Showing pattern of loss of limb cases in relation to anatomical level and cause

	Side affected			Cause			
Anatomical	Right	Left	Both	Congenital	Post-Traumatic	Others	Total
At or above Elbow	7	8	x	1	14	x	15 (16.5%)
Ar or above Wrist	4	8	2	3	11	x	14 (15.4%)
Thumb and 4 Fingers	2	2	2	1	5	x	6 (6.5%)
One Thumb	2	2	x	2	2	x	4 (4.4%)
Only 4 Fingers	4	4	1	3	6	x	9 (9.9%)
Thumb & little preserved	1	1	x	2	x	x	2 (2.2%)
At or above Knee	7	6	1	x	13	1	14 (15.4%)
Below Knee	8	7	2	1	16	x	17 (18.7%)
At Ankle	6	1	x	x	7	x	7 (7.7%)
Through mid-foot	2	1	x	x	3	x	3 (3.3%)
Total				13 14.3%	77 84.6%	1 1.1%	91 100%

knee loss cases 17 (18.7%). The cause of loss of limb is mostly 77 (84.6%) post traumatic amputation, then congenital deficiency 13 (14.3%) and only one is gas-gangrene amputee.

Discussion :

In the present study incidence of locomotor disability is four times higher in male than in female which is similar to findings of some workers[1,2]. In this study the pattern of locomtor disability is mainly paralysis of limb 430 (55.1%), then stiffness of joint 216 (27.7%), loss of limb 91 (11.7%) and kyphoscoliosis 22 (2.8%). Among paralysis of limb cases poliomyelitis is 349 (81%) which is 45% of total locomotor disables while other workers,[1,2,3] observed poliomyelitis 35.5%, 50%, and 69.2% of locomotor disabled in their studies. In this study in polio-disables lower limb involvement is four times more than upper limb against 26 times as in other studies[1,4]. In this study spastic cases are 9% of total locomotor disabled against 11.2% in the study of R. Kumar et al[2]. Among stiffness of joint congenital deformity is 51.9% which is 14.3% of locomotor disables and post traumatic stiffness is 35.6% which is 10% of total locomotor disability. These probably indicate the deficit of facility of reconstrutive surgery in rural area.

Here loss of limb is 11.7% of total locomotor disables against findings of 6.7% and 49.3% by other observers[2,1]. The maximum number of loss of limb cases are seen in the age-group of 20-40 years, upper limb loss 55% and lower limb loss 45%. These observations are similar to that of R. Kumar et al[2]. Here more number of left upper limb loss than that of right and more number of right lower limb loss than left do not agree with the findings of R. Kumar et al[2] which reveals equal involvement of right and left sides in both upper and lower limbs amputees.

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Pulmonary Functions and Effect of Incentive Spirometry During Acute and Post Acute Period in Tetraplegia

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Abstract

A prospective study was undertaken to evaluate if incentive spirometry can improve peak inspiratory mouth pressure (PIMP), peak expiratory mouth pressure (PEMP), and cough peak expiratory flow rate (CPEFR) in traumatic tetraplegia. Fifty patients who were seen within 7 days from the date of trauma were randomly selected for treatment (25 patients) and control (25 patients) group. The patient under treatment group received incentive spirometry training for 15 minutes per day, 7 days a week for six months.PEMP & PIMP were measured using an indigenously designed modified sphygmomanometer. CPEFR was measured using CPEFR meter. Measurements were taken on initial examination (basal value) and after the end of each week for 4 weeks, after 3 months and after 6 months & statistical test of significance were performed.Higher values of PEMP, PIMP, CPEFR were observed in both the groups. But in treatment group the improvement was significant to highly significant statistically.To conclude,incentive spirometry can improve PEMP, PIMP and CPEFR by increasing strength of innervated muscles and thus can improve cough capability, inspiratory capacity, endurance and perceived dyspnea, and can help in decreasing pulmonary complications.

Key Words : Tetraplegia, Pulmonary Function, Incentive Spirometry

Introduction

Pulmonary complications present a major threat in patients suffering from cervical spine injury[1], as it results in paralysis of intercoastal muscles leading to change in rib cage compliance and detrimental effect on diaphragmatic function causing it to operate from disadvantaged position[2]. Even in low cervical cord lesions normal function of fully innervated diaphragm is impaired due to paralysis of abdominal muscles[3].

Inspiratory and expiratory muscle dysfunction can be demonstrated by a marked reduction in static inspiratory and expiratory mouth pressure, and cough peak expiratory flow rate. It results in difficulty to cough out phlegm and increased risk of pulmonary complications[4]. It is therefore evident that tetraplegic patients require a comprehensive pulmonary rehabilitation with patient's involvement to improve; it's respiratory capacity.

A study was conducted in fifty patients of cervical spine injury to assess the respiratory muscle strength and to evaluate the effect of training on respiratory muscle strength and cough efficacy following exercise with incentive spirometer.

Material and Methods

Fifty consecutive cases of traumatic cervical spine injury with quadriplegia admitted in the

Department of Physical Medicine & Rehabilitation, S M S Hospital, Jaipur, from December 1996 to December 1998 were included in this study. Patients who had incomplete lesion, ASIA Grade C, D or E, tracheostomy, chest injuries, spasticity and those who reported after more than seven days from the date of trauma were excluded from the study. In all patients' peak inspiratory and expiratory mouth pressure were assessed by using a modified sphygmomanometer with a connecting tube and a mouthpiece. A bore was made at the upper end of the mercury gauze / column. The tube was connected to the lower end of sphygmomanometer for recording peak expiratory mouth pressure obtained by forceful expiration of air and rise of mercury column.Where as the tube was connected to the upper end for recording peak inspiratory mouth pressure by forceful inspiration / sucking and thereby rise of mercury column. The pressure generated was noted in millimeter of mercury (mm Hg).

Peak inspiratory and peak expiratory mouth pressure were selected because in contrast to lung volumes measurment and dynamic tests such as maximum breathing capacity, which many intrapulmonary diseases may alter. Determination of the maximal pressures is a specific method for estimating respiratory muscle strength[5,6].

Peak expiratory flow rate during cough was measured in litres per minute (lt / min) by vitalograph (Holland, lat no. 43000). It records peak expiratory flow values between 50 and 800 litres per minute and can read to an accuracy of approximately 10 litres per minute, cough peak expiratory flow rate was used to evaluate coughing and expiratory capabilities as it correlates well with peak expiratory flow rate, maximal breathing capacity test and with maximal rate of airflow of a recording pneumotachograph[7,8]. The testing procedure of rapid and deep expiration as did for cough peak expiratory flow rate gives a mirror view of expiratory efficacy as well as ventilatory capabilities. And the most important advantage of the peak flow rate is that it is a physiological measure and a convenient means of following cough response in patients with an ineffective cough due to neurological disorders.

Air life air incentive spirometer from Baxter (Lat No. 001900) was used for training of inspiratory group of muscles. It is attached with a calibrated dial , which can be rotated to increase or decrease the resistance of flow by increasing the minimal air flow allowances in ml/sec. The spirometer had setting range from 210 ml/sec to 1400 mL/sec.

These fifty patients were divided into two equal groups matching in age and sex. Control group was left alone without any intervention. Treatment group were assigned incentive spirometer exercises 15 minutes per day and seven days a week.

Initially cough peak expiratory flow rate was measured by forceful cough on "Vitalograph", whereas peak inspiratory mouth pressure and peak expiratory mouth pressure was measured by modified sphygmomanometer, in all patients who were on cervical traction with crutchfield tong in supine position. Cough peak expiratory flow rate was measured by forceful cough on "Vitalograph", whereas peak inspiratory mouth pressure and peak expiratory mouth pressure was measured by modified sphygmomanometer. Three repetitions were done after giving at lease ten seconds and up to one minutes of rest between the measurements depending on patient's ability and comfort for each measure and the mean was computed for each subject.

Peak inspiratory and expiratory mouth pressure and cough peak expiratory flow rate was measured before the beginning of protocol and at the conclusion of each week up to four weeks. Patients were then discharged with instructions to continue inspiratory muscle training protocol by incentive spirometer and were called for follow up, at three months and six months from the date of initial trauma.

Observation and Statistics

All cases ranged from 28 to 54 years were included in the study within seven days from the date of trauma.

Out of 25 patients in treatment group one was female (4%) and rest were male (96%). Two patients (8%) discontinued from the study as they did not come for follow up and 2 (8%) expired during study. So 21 patients (84%) were included for statistical analysis.

Out of 25 patients in control group one was female (4%) and rest (96%) was male. One patient (4%) expired during study, one (4%) had to be shifted to intensive care unit thus could not continue the protocol and one (4%) patient developed spasticity. So, 22 (88%) were included for statistical analysis.

The cough peak expiratory flow rate, peak inspiratory mouth pressure & peak expiratory mouth pressure showed improvement from the basal value, which was recorded at the time of admission.

On comparing the mean of peak inspiratory and expiratory mouth pressure at different points of time for all the patients in treatment and control group, improvement was seen in all the three measures but higher values were observed in treatment group. In peak inspiratory mouth pressure, improvement was found in both the groups but higher values were observed in treatment group (Table 1). The mean for change from basal value was calculated and test of statistical significance was applied significant to highly significant improvement of peak inspiratory mouth pressure was seen in treatment group (Table 2). In peak expiratory mouth pressure, higher values were observed in both the groups (Table 3) but on comparing the mean for change from basal value a statistically non-significant improvement was found (Table 4).

Similarly a improvement was seen in cough

Table 1 : Comparative values of mean standard deviation (SD) in peak inspiratory mouth pressure at different points of time in treatment and control group

	Mean ± SD (mm Hg)	
	Control	*Treatment*
Basal Value	9 ± 4.74	12.28 ± 5.93
After 1st week	9.54 ± 4.22	13.90 ± 4.60
After 2nd week	11.54 ± 2.00	15.62 ± 3.36
After 3rd week	14.36 ± 2.74	17.71 ± 3.28
After 4th week	15 ± 2.39	21.52 ± 2.46
After 3 months	19 ±2.15	29.80 ± 6.29
After 6 months	21.45 ± 2.64	32.38 ± 5.81

Table 2 : Comparative values of mean change standard deviation (SD) in peak inspiratory mouth pressure from basal value to measurements at different points of time in treatment and control group; & its significance.

	Mean change ± SD (mm Hg)		*P value*	*Significance*
	Control	*Treatment*		
After 1st week	0.54 ± 2.06	1.62 ± 2.42	> .05	Not Significant
After 2nd week	2.54 ± 3.76	3.34 ± 3.30	> .05	Not Significant
After 3rd week	5.36 ± 3.87	5.43 ± 3.75	> .05	Not Significant
After 4th week	6 ± 4.99	9.24 ± 5.81	< .05	Significant
After 3 months	10 ± 4.78	17.52 ± 9.16	< .01	Significant
After 6 months	12.45 ± 4.78	20.01 ± 8.35	< .001	Highly Significant

Table 3 : Comparative values of mean standard deviation (SD) in peak expiratory mouth pressure at different points of time in treatment and control group.

	Mean ± SD (mm Hg)	
	Control	*Treatment*
Basal Value	6.18 ± 4.30	7.52 ± 3.46
After 1st week	6.54 ± 4.14	8.19 ± 2.89
After 2nd week	9.73 ± 1.38	12.67 ±1.98
After 3rd week	11.91 ± 1.53	17.23 ± 2.65
After 4th week	16.36 ± 1.87	19.90 ± 3.46
After 3 months	19.45 ± 2.84	22.95 ± 2.59
After 6 months	21.54 ±2.76	24.09 ±2.64

Table 4 : Comparative values of mean change standard deviation (SD) in peak expiratory mouth pressure from basal value to measurements at different points of time in treatment and control group; & its significance

	Mean change ± SD (mm Hg)		*P value*	*Significance*
	Control	*Treatment*		
	Control	Treatment		
After 1st week	0.36 ± 2.10	0.67 ± 2.31	> .05	Not Significant
After 2nd week	3.73 ± 3.56	5.15 ± 2.49	> .05	Not Significant
After 3rd week	5.73 ± 3.40	9.71 ± 3.65	< .001	Significant
After 4th week	10.18 ± 3.76	12.38 ±5.04	> .05	Not Significant
After 3 months	13.27 ± 4.16	15.43 ± 3.85	> .05	Not Significant
After 6 months	15.36 ±4.38	16.57 ± 3.80	> .05	Not Significant

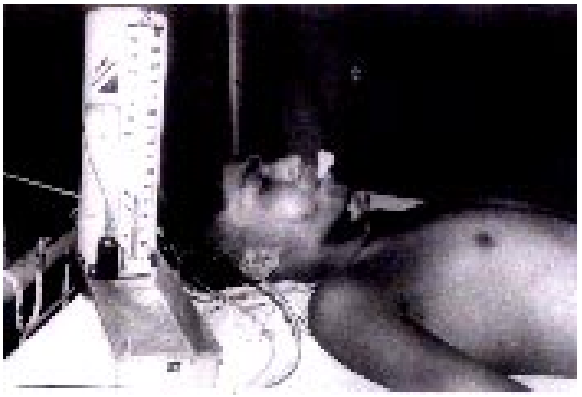
Table 5 : Comparative values of mean standard deviation (SD) in cough peak expiratory flow rate at different points of time in treatment and control group

	Mean ± SD (mm Hg)	
	Control	*Treatment*
Basal Value	42.27 ± 36.05	68.09 ± 41.36
After 1st week	45 ± 34.87	70.95 ± 42.30
After 2nd week	65.19 ± 17.50	92.38 ± 29.42
After 3rd week	75.45 ± 12.33	122.96 ± 16.66
After 4th week	93.18 ± 12.57	130.95 ± 14.44
After 3 months	108.18 ± 13.36	141.90 ± 15.00
After 6 months	125.45 ± 11.17	162.85 ± 23.33

Table 6 : Comparative values of mean change standard deviation (SD) in cough peak expiratory flow rate from basal value to measurements at different points of time in treatment and control group; & its significance.

	Mean change ± SD (mm Hg)		*P value*	*Significance*
	Control	*Treatment*		
After 1st week	2.73 ± 13.86	2.86 ± 6.44	>.05	Not Significant
After 2nd week	22.73 ± 26.56	24.29 ± 23.14	>.05	Not Significant
After 3rd week	33.18 ± 27.15	54.77 ± 38.16	<. 05	Significant
After 4th week	50.91 ± 30.69	62.86 ± 41.25	>.05	Not Significant
After 3 months	65.91 ± 32.75	73.81 ± 41.53	>.05	Not Significant
After 6 months	83.18 ± 33.45	94.76 ± 44.90	>.05	Not Significant

Fig.1 Measuring PEMP with modified sphygmomanometer.



peak expiratory flow rate in treatment and control group (Table 5), but on comparing mean change observed in cough peak expiratory flow rate from basal value a non-significant improvement was found (Table 6).

Discussion

The pulmonary functions of fifty tetraplegic subjects were evaluated by peak inspiratory mouthpressure, peak expiratory mouth pressure and cough peak expiratory flow rate with an aim to determine whether incentive spirometry can improve the respiratory capabilities & cough

efficacy.

Incentive spirometry was used as a mode of training in patients with tetraplegia in treatment group and the device selected was such that it provided resistance to the airflow and patient could adjust their inspiratory pressure load or resistance by adjusting it's airflow allowance.

During initial acute & post acute period low columns of peak expiratory & inspiratory mouth pressure were observed because during this period respiratory muscles are paralyzed and there is instability of the chest wall along with rib cage abdominal paradox[9]. Expiratory muscle strength is decreased more severely than inspiratory strength and the expiratory muscle weakness causes a decrease in the effectiveness of cough as reflected by low cough peak expiratory flow rate.

Improvement was observed in all the three measures in comparison to basal value in both the group of patients but it was higher in those who were on incentive spirometry. The general improvement in both the groups can be considered related to, change from muscle flaccidity associated with the initial phase of spinal shock to trained accessory muscle status and slowly developing hypertonicity of the paralyzed intercostals and abdominal muscles[10].

On comparing the two groups, significant to highly significant improvement in peak inspiratory mouth pressure in tetraplegics was observed in those who were on incentive spirometry.

Tetraplegics are predisposed to chronic alveolar hypotension, which is due to increased work required to overcome the extra pulmonary resistances. Early fatigue in these patients leads to respiratory acidosis, which can be assessed by associated signs and symptoms[11]. Though inspiratory muscles are trained with each breath as it is a active process and slowly it improves but incentive spirometery trains the innervated respiratory muscles by providing strengthening of these muscles and thereby increase peak inspiratory mouth pressure which results in improved dyspnea, increase in both strength and endurance[12,13,] protection against fatigue and reduced metabolic cost of breathing[14].

Awareness of phlegm or wheeze, ineffective cough and resulting chronic retention of secretion are the root cause of various pulmonary complications in tetraplegics. The reasons are both loss of expiratory muscles strength as well as decreased vital capacity due to loss of inspiratory muscles and in spinal injured population expiratory muscle strength is often decreased more severely than inspiratory strength. Expiratory muscle weakness causes a decrease in the effectiveness of cough due to impairment in cough induced dynamic compression, leading to a reduction in the velocity of air flow as seen by the low values of cough peak expiratory flow rate. An improvement of peak expiratory mouth pressure and cough peak expiratory flow rate was observed in both the groups. The increase in expiratory flow rate is related to vital capacity and in a tetraplegic patient vital capacity increases with time from an approximate doubling of vital capacity three months after injury to 60% of predicted by fifth month 10. This improvement is due to change from muscle flaccidity of initial phase to increasing tone of paralyzed intercostals and abdominal muscles with time[15]. In treatment group still higher values can be attributed to increased inspiratory capacity and vital capacity due to incentive spirometry exercise, because to achieve an effective cough the patient must reach the largest lung volume possible prior to initiation of cough 16 but it was non significant because specific training of expiratory muscles was not undertaken and without expiratory muscles it is impossible to generate high intrathoracic pressure to accelarate air flow.

Incentive spirometry can thus be used in tetraplegics during acute and post acute period as

a preventive measure to reduce pulmonary complications most of which are due to decreased inspiratory capacity and chronic retention of secretions due to decreased expiratory pressure and flow. It also improves neuromuscular coordination, so patients can consciously breathe deeper and slower. When exerting them it may also decrease the fear of dyspnea and can thus put them in a position to attempt a higher level of activity.

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CME Paper

Rehabilitation Management of Mentally Retarded Amongst Physically Disabled

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The one having physical or mental disability, more often than not, becomes a parasite on the family and the community making life a miserable, experience. In the life pattern of developed countries, disabled today have become a productive member of the society and can look back on their life with satisfaction. In contrast, in traditional societies like India, due to low aconomy conflict with ignorance, the disabled have yet to find a place in the mainstream of social life, away from the usual occupation of begging.

Mental retardation refers to subaverage general intellectual functioning which originates during the development period and is associated with impairment in adaptive behaviour. The mentally retarded from childhood experiences unusual difficulties in learning which affects his capacities for adjustment in day to day living. General intellectual functioning means the results obtained by administration of standardized general intelligence tests for the purpose. The significant subaverage is defined as I.Q. of 70 or below on the standardized scale of intelligence. The adaptive behaviour is defined as the degree with which the individual meets the standards of personal independence and social responsibility in relation to his age and cultural environment. The expectation of adaptive behaviour vary with the chronological age. The deficits in adaptive behaviour may be reflected in the three areas i.e. during infancy and early childhood, during childhood and adolescence and during late adolesdence and adulthood.

(a) During infancy and early childhood in
- Development of sensory and motor skills
- communication skills (speech and language)
- Self help skills
- socialization.

(b) During childhood and adolescence in
- use of basic academic skills to activities of daily life.
- application of reasoning and judgement in the mastery of environment.
- use of social skills

(c) During late adolescence and adulthood in
- vocational performances and social responsibilities.

Classification

There are various method of classification of mentally retarded like medical, educational and psychological. The medical is based on the aetiology, educational on the current level of functioning of MR and psychological on the level of intelligence. These classification provide an idea of the level at which a mentally retarded person functions in relation to his education, appropriate behaviour and the degree of his independence.

Educational
- Educable
- Trainable
- Custodial

Psychological	-	Mild	(50-70)
	-	Moderate	(35-49)
	-	Severe	(20-34)
	-	Profound	(below 20)

Multiple Handicapped

A person with more than one of the four handicaps like physical, hearing, visual and mental, is classified under multiple handicap. These cases grow, learn and develop much more slowly as compare to children having one disability. Therefore they required energetic training to perform ADL skills, Cerebral palsy with MR is one of the commonest form of multiple handicap where there is motor disturbances and lack of coordination in movements. It is rather difficult to pinpoint the intensity of each of the handicap in an multiple handicapped person. However proper and accurate assessment of the various handicaps is necessary in such children before a management plan is drawn for them.

Diagnosis

The detailed information from the parents is needed before making the diagnosis which includes - detailed history about status of health of the mother during pregnancy, nature and type of delivery of the child and associated difficulties if any, postnatal - status of health of child after birth, for example, illness like fever, fits, jaundice, measles, history of similar illness in the family, immunisation etc. Then development assessment is done followed by administration of intelligence tests. The child is assessed on the assessment checklist to find out the current level of functioning.

Rehabilitation Management Plan

It depends upon the current level of the child and the associated conditions such as epilepsy, hyperkinesis, behaviour problem and sensory handicaps. The plan varies from infant stimulation, training in ADL skills. Further in cases of MR amongst physically disabled, apart from this, management includes help in posture, locomotion, problematic behaviours and treatment of medical condition.

Management Team : The assessment and management of a case of mental retardation is undertaken by a team consisting of psychiatrist or physical medicine expert, psychologist and a special educationalist. The other members of team included are speech therapist, physico-occupational therapist, social worker and a vocational counsellor. After a thorough assessment, the case is referred to either special school whesever possible, home based training or vocational training.

In overall management, there is very significant role of counsellor to help the parents in understanding and accepting the child's problem. This requires a life long adjustment. In order to assist the parents in dealing effectively with the situation, counselling for behaviour modification is essential, as a part of the whole rehabilitation management plan. The focus of counselling depends upon the individual needs and requirement of the mentally retarded and his family.

Parent Counselling : the parent counselling is done as given below;

(1) To provide information regarding the condition of the mentally retarded child. The counsellor should explain child's condition in simple words to the parents and give enough trial. Further information regarding management of his associated medical problem and other disabilities must be made available to the parents. The false hopes should be avoided.

(2) Development of correct attitudes towards their handicapped child.

Usually parents have wrong beliefs, ideas and thoughts regarding causes and treatment of their disabled child. They blame each other for

being responsible for the birth of such child due to lack of awareness. Parents tend to believe that the child would become normal in due course of time. Hence counsellor should give correct information on the nature, causes and treatment of mentally retarded child.

- Attitude of over protection, rejection should be changed so that the child can be helped to learn proper and reasonable training.
- Some of the parents have the feeling of guilt that they are responsible for their child's condition. The parents should be explained that it is generally due to causes over which parents have no direct control.
- Creation of awareness in parents regarding their role on training mentally retarded child.
- Usually when parents bring the child for assessment they tend to believe that the whole management will be taken care of by the staff working for mentally retarded. Here again counsellor plays a very effective role in educating the parents about their role in training the child.
- Parents also feel that training of such child requires specialized skills and they may to be able to train their child. Parents should be explained that training of child does to need special or complex skills and the child can learn with repeated training in simple ways.
- Parent groups meeting having parents of mentally retrarded children who have been already helped with the parents of earlier identified children, will be purposeful for proper interaction among themselves.
- Parents should be helped to learn the skills of training and then they should be demonstrated how their training has helped the child to learn the few skills, so that parents can have a feeling of achievement.

Community Awareness :

The society should be made aware of the need to recognize the mentally retarded persons and give enough care to make them as independent as possible. The various modalities of communication for reaching out to the community should be utilized. The vocational counsellor should tap the resources available in the rural community and try to intergrate the mentally retarded persons both physically and socially into the community to the extent possible regardless of the degree of retardation. Thus a dedicated involvement of a counsellor is essential in making society aware of problems of the mentally retarded persons and to make the community work towards normalizing them.

Vocational Training & Work Placement :

The rehabilitation management aims for social and occupational adjustment in adulthood. Proper and need based guidance is essential for appropriate vocational training and work placement. It is necessary to see his willingness for the work, before he is given a job. A simple checklist to assess the individual's readiness includes degree of independence in ADL, social skills, reaction to superiors, work ability, behaviour and health status.

The various types of work are available according to the resources in the community and the ability of the mentally retarded person. In rural areas, he can be involved in farming, bees keeping, poultry, dairy and other simple service jobs. In the urban areas, he can be involved as attendant, helpers for semiskilled or unskilled jobs.

The vocational guidance counsellor should make a proper analysis of the job as well as suitability of the retarded person to fit in before placing the person. Satisfactory job placement will be possible only if the job requirement and the concerned retarded person's ability are matched.

The proper and periodical follow-up is necessary after job placement of the mentally retarded person. They are more successful in jobs which requires simple repetitive operations than those where they have to make decisions or change the activities.

The mentally retarded can be gainfully placed in the work in three situations i.e. self employment, sheltered employment and open employment depending upon his level of retardation, aptitude, resources in the family and community.

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Disability Evaluation - From Guestimates to Gazette Notification

Historical evidence suggests that social justice and systems of compensation have existed since ancient times. The practices of impairment rating and disability determination have traditionally been the purview of the physician examiner. The physician disability examiner is typically expected to diagnose and treat a medical impairment and to determine its disabling effect(s) on a variety of functions. During the past three decades, medical experts, especially specialists in Rehabilitation Medicine (Physical Medicine and Rehabilitation, or Physiatry), have played a very important and leading role in the process of development of uniform guidelines for assessment of impairments and disability throughout the world, including India. Prior to 1986, in India, experts were using a variety of guidelines, namely Workman's Compensation Act, ESI Act, ALIMCO booklet (reprint of guidelines developed by American Academy of Orthopaedic Surgeons, 1962), guidelines developed by Earl D McBride (1963), H. H. Kessler (1970), or American Medical Association (1971), and Manual for Doctors to Evaluate Permanent Physical Impairment (1981).

Ministry of Welfare, Govt. of India issued an O.M. No. 4-2 / 83-HW.-III, dated the 6th August, 1986 dealing with uniform definitions and general guidance for evaluation and assessment of various disabilities. These guidelines were in major part, recommendations of the national expert group meeting on disability evaluation, held at AIIMS in September 1981. Keeping in view the Persons with Disabilities (Equal Opportunities, Protection of Rights and Full Participation) Act, 1995, as well as based on the experience of use of the above mentioned guidelines, Ministry of Social Justice and Empowerment, Government of India vide Order No. 16 - 18 / 97 - NI. I, dated 28-8-1998, set up four committees under the Chairmanships of Director General of Health Services- one each in the area of mental retardation, Locomotor / Orthopaedic disability, Visual disability and Speech & Hearing disability. Subsequently, another Committee was also constituted on 21-7-1999 for evaluation, assessment of multiple disabilities. In June 2001, the final guidelines for disability evaluation and certification were issued through a Govt. of India Gazette notification. As per this Gazette notification, the certificate would be valid for a period of five years for those whose disability is temporary. For those who acquire permanent disability, the validity can be shown as 'Permanent'. Also, the minimum degree of disability should be 40% in order to be eligible for any concessions / benefits. Earlier, the Persons with Disabilities Act, 1995 had defined "severe disability" as a disability to the extent of eighty percent and above, for the purpose of recognition and maintenance of institutions working for persons with severe disabilities. Gone are the days when one could use the terms mild, moderate, severe, profound disability arbitrarily, without referring to any valid document.

An ideal scale for disability evaluation should be sensitive, specific, reliable, appropriate, acceptable, and robust. Each must be validated against standard criteria to which the attribute may be assessed. Many disability measures have not been validated and value of their robustness is required not only as a general measure, but as a measure of specific rehabilitation activity, e.g. the Barthel ADL Index in stroke rehabilitation. The recent Gazette notification, in major part the same as the August 1986 document, also needs to be tested on these criteria. Till date there are no guidelines which are agreeable to all the experts in different parts of the world

or even within the same country or State.

The Gazette document is available in Hindi and English languages. It contains a little background, constitution of various Committees, methods of estimation of different types of impairments and disabilities, appendices containing upper limb activities, lower limb activities, criteria for dwarfism, a copy of the proposed format for disability certificate, and a ready-reckoner to compute figure by using combining formula a + b (90-a) / 90. All these are useful elements and make the task a bit easier.

Today disability evaluation is no longer a problem for Workmen's Compensation alone. A certificate stating the nature and extent of disability issued by a competent authority is required by a person with disability in order to avail benefits under different schemes for assistance to disabled persons. The importance of acquiring a more thorough understanding of the subject of disability evaluation has gained great momentum in the past few years. The medical expert witness has found it necessary to use sound medical reasoning based upon all factors of physical impairment rather than rely on snap judgement in expressing an opinion on the percentage of disability. Guessing casts reflection on integrity and qualifications. Wide difference of medical opinions breeds suspicion of prejudice. If an opinion is to be expressed it must be based upon same sound scientific reasoning as is used in arriving at any medical diagnosis. The use of numerical values is preferred because of difficulty in communication and variability in interpretation of such terms as mild, moderate, severe, slight, marked etc.

"When you cannot measure it, when you cannot express it in numbers, you have scarcely, in your own thoughts, advanced to the stage of science, whatever the matter may be." Lord Kelvin.

Although, one may say that now we have a Gazette notification regarding guidelines for disability evaluation and certification and therefore all problems are over. This is far from true. It needs to be realised that although we have some guidelines, these are far from perfect. There are still many issues which need to be discussed, debated and resolved. There are a number of shortcomings even in these guidelines. There appears to be an element of arbitrariness in terms of percentages assigned to some of the problems. It would have been better had some of the recent documents related to objective evaluation of impairments and disabilities being used by some of the developed countries been referred to in order to avoid some of the shortcomings noticed in these guidelines.

Added to this is the fact that the information about these guidelines, let alone a copy of these guidelines, is not available to a large majority of Orthopaedics, Ophthalmology, ENT, Psychiatry or Rehabilitation Medicine specialists in the country. These guidelines need to be well understood before one starts using them and for this one may have to undergo some short duration orientation and practice under the guidance of specialists who are well versed with various issues related to assessment of disability. One must also understand the difference between impairments and disabilities. Unlike disability, permanent impairment can be measured with a reasonable degree of accuracy and uniformity. It is universally recognized that assessment of impairments and disabilities is a very important but difficult, complex and debatable exercise.

Many readers may not agree with the views expressed by me above, but even if these views are not accepted or adopted, it is hoped the reasoning used will be a helpful influence and there will be discussion and debate to move forward in the direction of better and clearer guidelines with less of arbitrariness and more of objectivity.

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