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Breathing Pacemaker in Poliomyelitis -A Case Report.

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Abstract

Poliomyelitis is a disease of ambiguity that usually affects the children. Though the disease commonly affect the lower limbs, rapidly developed quadriplegia with progressive respiratory difficulties are often encountered. It can be diagnosed confidently with Physical examination and stool culture. Such a quadriplegic case with respiratory drive failure is resuscitated with ventilator in intensive care unit. Rehabilitation with breathing pacemaker system is an acceptable way of weaning the ventilator. Advantage of breathing pacemaker system over the ventilator is numerous. The system was made available and a team of surgeons operated to implant it. Externally placed transmitter and antennas transmit energy to the bilaterally implanted receivers, which convert the radio signals into stimulating pulses delivered to both phrenic nerves by the corresponding implanted electrodes. The hemidiaphragm then contract, producing inhalation of air. The train of pulses then stops, allowing the diaphragm to relax and exhalation to occur in a passive process. This cyclic repetition of pulse trains followed by no pulses produces a normal breathing pattern. The total system can be monitored through a system via telephone called "Trans Telephone Monitoring" (TTM). The diaphragm, like other skeletal muscles when denervated is expected to atrophy and therefore, become fatigued upon stimulation. Re-training and reconditioning programs are being carried out to have the full functioning of the pacemaker. The boy now improving very slowly and is discharged with a portable ventilator. This case note represents the first case of poliomyelitis with breathing pacemaker so far.

Key Words: Poliomyelitis, Breathing Pacemaker, TTM, Ventilator.

Introduction

Cavallo first proposed the use of electrical stimulation to artificially controlled respiration in 1777 shortly after the discovery of electricity. More conventionally electrical stimulation has been used to provide clinical ventiltory support for ventilator dependent quadriplegics, patients with central hypoventilation syndrome and patients with sleep apnoea. The external radio frequency transmitter sends signals through two antennae taped to the skin. These stimuli are picked up by bilateral receivers implanted under the skin and electrical pulses are delivered by electrodes attached to the phrenic nerves. Bursts of pulses delivered to the phrenic nerves

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cause each hemidiaphgragm to contract giving rise to expansion of the lungs (inhalation of air). When the train of pulses stops, the diaphgragm relaxes and exhalation occurs in the passive way. These bursts of pulses are typically applied for 1.6 seconds and repeated 12 times per min. permitting 24 hours breathing in quadriplegics without a tracheostomy. Breathing pacemakers have been used to treat patients with phrenic nerve damage, multiple sclerosis, GBS, obstructive pulmonary disease, spinal muscular atrophy, idiopathic diaphragmatic paralysis and chronic hiccup[2-5]. Data of 700 patients ranging from younger than 2 months to 89 years of age demonstrate that some of these patients have been successfully undergoing pacing for more than 20years[6].The limiting factor is whether the phrenic nerve and the diaphragm muscles are intact or whether they can be stimulated with suitable current stimulus. Breathing pacemaker in polio patients are not known. This case report demonstrates the first implanted breathing pacemaker in poliomyelitis.

The Case Report

Amit, 10 years old school boy from Dhaka city was admitted in the paediatric unit of Bangabandhu Sheikh Mujib medical university hospital, Dhaka, during september 1999. He had complaints of mild continuous fever, headache and pain in the limbs for 5 days. Following the 2nd day of hospital admission, headache was further intensified with addition of his neck stiffness and weakness in the limbs. Within next few hours, limb weakness further deteriorated and he developed frank quadriplegia with rapid respiratory insufficiency. General and neurological examination revealed, normal higher psychic function and no motor function in the limbs, cranial nerve function was normal. Deep tendon reflexes were absent. There was mild dissociation of pain, touch and temperature sensations below C2 on the right side and C3 on the left. Routine laboratory investigations revealed no abnormality. Lumber puncture demonstrated significantly raised CSF protein, reduced sugar and a normal electrolyte content with sterile culture. Stool sample was sent for poliovirus. He was given a course of interferon with the differential diagnosis of GBS, and poliomyelitis. Following further deterioration of respiratory function he was transferred to intensive care unit. An emergency tracheostomy was done and he was put to a ventilator and PPMV was continued. Stool report confirmed polio with isolation of P -1 virus.

After 10months in ICU, he was presented in a clinical meeting, where suggestions are sought from different specialists regarding further management. Rehabilitation team proposed for the possibility of a breathing pacemaker.

Clinical examination during August 2000 revealed, he was full conscious and oriented. All 4 limbs were wasted grossly with just flickering of muscle movements. Level of sensori-motor quadriplegia was below C3. Deep tendon reflexes were absent. Routine chest and pulmonary function tests demonstrated that he has a forced tidal volume of 0.35L with some reduced function on the left lung and a normal functioning right lung. Transcutaneous stimulation of the phrenic nerve in the neck was not successful. EMG of intercostal muscles showed positive sharp waves with increased insertional activity. EMG of the diaphragm and the phrenic nerve conduction velocity was not possible due to technical difficulties. It is assumed that he is going to be permanently ventilator dependent and a partial functioning of the phrenic nerves are possible. Breathing pacemaker is an alternative to ventilator, which works in partial functioning phrenic nerves as well, is much superior physiologically and is

cost effective. The viability of the phrenic nerves was determined intra-operatively during implantation operation under direct vision.

Breathing pacemaker system was made available. It costs about 76,000 US dollar. A team of surgeons with the-onsite instructions of a biomedical engineer, operated to implant the system using the standard fascian of surgery. Testing with sterile antenna prior to closure demonstrated contractions of both hemi diaphragms confirming the integrity of the phrenic nerves. Post operative come-up was un-eventful.

After 4—weeks of implantation operation, a standard protocol was begun to stimulate the diaphragm. Initially, the patient was given 3 minutes of pacing. Within the course of a month, he was able to tolerate 10 minutes of pacing of the diaphragm with constant complaints of tiredness, sweating and tachycardia. Diaphragm movement was confirmed by fluoroscopic examination. "Trams Telephone Monitoring"(TTM) was not possible due to technical difficulty. Over the period of next 3 months, the patient showed slow improvement of pacing time. He was discharged with a portable ventilator. Father of the child was trained to operate the portable ventilator with on call assistance of an ICU doctor. At the end of one year of implantation operation, he could continue respiration for 4 hours per day using the pacemaker system.

Discussion

The diaphragm is the principal muscle of respiration. Motor supply of the diaphragm is by the phrenic nerve whose root value is from C3 to C5, mainly C4. In an individual with a spinal cord lesion above C3, the diaphragm becomes paralyzed but the phrenic nerve is expected to be viable. Poliomyelitis affects the anterior horn cells of the spinal cord or motor nuclei of the brain. A small fraction of the patients with paralytic polio need chronic respirator care. The return of muscle strength occurs mainly in the first 3-4 months and is the result of enlargement of motor units by re-innervation and by morphologic restitution of partially damaged nerve cells. Slow recovery of slight degree may then continue for a year or more. Branching of axons of intact motor cells with re-innervation of muscle fibres of denervated motor units may also play a part[7].

Transcutaneous stimulation of the phrenic nerve was found to elicit response of the diaphragm in 1984[8] and since then electrophrenic respiration was applied. Electrophrenic respiration through implanted radio-frequency stimulator was first introduced by van Heekren and Glenn in 1966[9] First pacing was used in patients with Ondyne's curse. With this initial success, breathing pacemaker found broader application in ventilator-dependent patients with respiratory drive failure. Glenn and co-workers reported the first case of total ventilatory support of a C2 quadriplegic[10]. All the above conditions require the phrenic nerve to be intact to allow the conduction of the artificial stimulus to the diaphragm. Axonal continuity should be tested before implantation of a pacing system[11] although we could not make the facilities available in our case. Transcutaneous stimulation of the phrenic nerve has been shown to be successful in 95 of 100 patients[11] however, failure of the diaphragm to contract when transcutaneous stimulation is applied to the phrenic nerve does not necessarily mean that the nerve will not respond to direct stimulation. Definitive test of phrenic function is achieved via open dissection of the phrenic nerve, as happened to our case. TTM feedback is an useful way of monitoring the system but due to technical difficulties we could

not avail it.

The denervated muscle is expected to atrophy and, therefore, become quickly fatigued upon stimulation. So it requires a reconditioning period that may take a period even of two years or more.

Conclusion

This case represents the first implanted breathing pacemaker in polio patients. Diaphragm pacing provides physiological respiratory function far superior to that provided by mechanical ventilators since the inhaled air is drawn in, rather than being forced into the chest under mechanical pressure. The benefit of breathing pacemaker over the ventilator is numerous. 24 hours continuous pacing is expected although the presented case is improving very slowly.

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A Study on the Role of Needling and Infiltration in Fibromyalgia and Myofascial Pain Syndrome

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Abstract

Patients with muscle pain, localised or generalised, is a common presentation in Physical Medicine and Rehabilitation department. It produces much morbidity to the patient and responsible for loss of working days of the individual .The study aims to findout a simple treatment which can be applied in outpatient basis even in rural setting . 30 patients, 15 each of fibromyalgia and myofascial pain syndrome, were considered for the present study. Age of the patients ranges from 18 - 55 years. Each patient was treated , once or twice, with needling and infiltration of 1% lignocaine in the tender spot / trigger point in right or left upper trapezius muscle. Patients were followed for one month. Clinical response was measured for subjective improvement by visual analogue scale as well as for objective improvement by pressure algometer. Like some former studies sustained improvement was noted mainly in myofascial pain syndrome. Thus it is worthy of trying needling and infiltration in myofascial pain syndrome cases.

Key Words : Muscle Pain - Fibromyalgia and Myofascial Pain Syndrome - Needling and Infiltration.

Introduction

Muscles make up 40% of the mass of human body. The forces muscle generate and mechanical stresses they are subjected to are tremendous . Muscle pain is a universal experience. The muscle pain syndrome, however, have yet to achieve universal acceptance in the medical community.[1]

Myofascial pain is considered to be one of the important causes of pain.[2] Muscle pain may be generalised or localised. It produces substantial morbidity and socio-economic impact. Simon[3] indicates that about 30% of patients attending a general medicine clinic with a chief complaint of pain are found to have myofascial pain. Common denominator of muscle syndrome is negative laboratory finding particularly absent evidence of inflammation.[4] Cases can be divided into myofascial pain syndrome with regional pain and fibromyalgia with widespread pain and systemic feature.[5] Trigger point is a criterion for myofascial pain syndrome and sustained pressure (10 seconds) or penetration by a needle of the trigger point causes referral of pain to defunite sites . There may or may not be a palpable nodule at the site. Often trigger point is located within a taut band.[6] Criteria for fibromyalgia are widespread aching for 3 month , pain above and below the waist, pain on both right and left side of the body along with axial pain and presence of 11 out of 18 tender points on digital palpation with an approximate force of 4 kg.[7] Pressure on tender spot produces pain without radiation .

The present study aimed to know the efficacy of needling and infiltration, a simple procedure which can be done in outpatient department in remote rural setting , in patients with muscle pain

Materials & Methods

The study was carried out in the department of Physical Medicine and Rehabilitation , Medical College Kolkata between Jan 1999 and Dec 1999. 30 patients , in the age group of 18-55 years , having localised or generalised muscle pain along with chronic neck pain were confidered for the present study . Table 1 shows the distribution of the patients .

Inclusion criteria :

1. Muscle pain , localised or generalised , along with chronic neck pain .
2. Muscle pain present for more than 3 months.
3. Age above 18 years .
4. Patients giving consent to be included in the study .

Exclusion criteria :

1. Association with other rheumatic diseases .
2 . Preganancy.
3 . Patients refusing injection.
4 . Past history of hypersensitivity to lignocaine.
5. Bleeding disorders or patients under anticoagulant.
6 . Presence of local or systemic infection.

A detailed history was taken and thorough physical examination was done to divide the patients into fibromyalgia (The American College of Rheumatology 1990 Criteria)[8] and myofascial pain syndrome (Simons AG 1990)[9]. Baseline investigation for RA factor , C- reactive protein, haemogram and radiological investigation viz. X-ray cervical spine were done.

Irrespective of diagnosis, fibromyalgia or myofascial syndrome, local needling and infiltration of 1% lignocaine with 24G needle was done in tender spot / trigger point on right or left upper trapezius muscle . Each patient was asked to follow advice regarding neck exercise and posture care. A second needling and infiltration was done in some cases at the same site after one week of the 1st needling and infiltration. (Table 2)

Concurrent therapy :

Patients were advised to avoid any medication for pain during the study.

Patients were followed at one week and one month after the 1st needling and infiltration and evaluated for subjective improvement by Visual Analogue Scale (VAS) of 100 mm and objective changes of pressure threshold of tender spot / trigger point by Pressure Threshold Meter (Algometer).

Results and Analysis

Fig. 1 compares the changes in Visual Analogue Scale readings as a result of needling and infiltration in patients with fibromyalgia and myofascial pain syndrome. In cases of fibromyalgia although slight improvement was noted at 1wk 90.67 ± 14.43 but at 1 month pain returned to pretreatment level (100). In cases of myofascial pain syndrome, mean Visual Analogue Scale readings were 100 cm. at the time of 1st injection, at 1 wk 41.33±17.27

and at 1 month 16.67±15.43. Thus following needling and infiltration persistent significant subjective improvement was noted only in patients with myofascial pain syndrome.

Fig 2. shows changes in readings of pressure Algometer as a result of needling and infiltration in patients with fibromyalgia and myofascial pain syndrome. In fibromyalgia slight improvement was noted at 1 wk , as slight greater pressure was needed to elicit tenderness at tender spot (4.46 ± 0.74 as compared to 4 at 1st visit). But at 1 month followup, pretreatment level returned i.e. tenderness could be elicited with a pressure of 4 kg/cm 2. But in cases of myofascial pain syndrome, there was gradual improvement during the study period . At 1 wk mean pressure required to elicit tenderness at trigger points was 3.53± 0.74 and at 1 month the value was 5.06±0.70 both of which were greater than the corresponding reading at 1st visit 2.06 ±0.79 .

Thus in fibromyalgia, though slight improvement was noted at 1 wk but ultimately patients returned to pretreatment level at 1 month. In cases of myofascial pain syndrome, there was gradual improvement even at 1 month.

Table 1 : Showing characteristics of patients.

	Fibromyalgia	*Myofascial pain syndrome*
1. Age of the patients	30.13 ±11.35 (18 - 55 years)	32.27 ± 10.27 (20 - 48 years)
2. Sex	F=12, M=3	F=11, M=4
Duration of illness	7± 2.62 (3 - 12 months)	7.06 ±2.46 (3 - 11 months)

Table 2 : *Number of needling and infiltration required .*

	One Injection	*Two injections*
Fibromyalgia	5 patients	10 patients
Myofascial Pain Syndrome	12 patients	3 patients

Table 3 : *Shows mean value ± standard deviation of readings of visual analogue scale and pressure algometer in cases of fibromyalgia.*

	At entry	*At 1 week*	*At 1 month*
Visual Analogue Scale	100	90.67±14.38	100
Pressure Algometer	4	4.46± 0.74	4

Table 4 : *Shows mean value ± standard deviation of readings of visual analogue scale and pressure algometer in cases of myofascial pain syndrome.*

	At entry	*At 1 week*	*At 1 month*

Visual Analogue Scale	100	41.33±17.27	16.67±15.43
Pressure Algometer	2.06± 0.79	3.53± 0.74	5.06± 0.70

Fig . 1 : Comparison of Visual Analogue Scale readings as recorded during the study in fibromyalgia and myofascial pain syndrome patients.

(Not Available)

Fig . 2 : Comparison of readings of Pressure Algometer as recorded during the Study in fibromyalgia and myofascial pain syndrome patients .

(Not Available)

Disscussion

Though patients with muscle pain is a common experience in Physical Medicine and Rehabitation department, there is no single treatment protocol that can control the disease process and naturally the patients search for alternative treatment.

As per criteria for selection of patients, laboratory results were negative except degenarative changes in cervical spine in older patients .

Local needling and infiltration is ineffective in tender spot of fibromyalgia but effective in myofascial pain syndrome (Schneider MJ)[10]. This is also found in our study where initial improvement was noted in some cases of fibromyalgia (5 out of 15) but even in those cases signs and symtoms ruturned to the pretreatment level at the conclusion of the study. But in all cases of myofascial pain syndrome, substantial improvement of signs and symtoms were noted at the end of the study . Schneider MJ concluded that fibromyalgia and myofascial pain syndrome are two different clilnical conditions that require different treatment plans.Fibromyalgia is a systemic disease process and requires multidiciplinary treatment approach including psychotherapy, low dose antidepressant medication and a moderate exercise programe . Myofascial pain syndrome, on the otherhand, is a condition that arises from the referred pain and muscle dysfunction caused by trigger points which often respond to local treatment . Hong - CZ[11] studied to know the effects of injection of local anaesthetic agent and dry needling in the myofascial trigger point of upper trapezius muscle . Improvement was assesed by measuring subjective pain intensity, the pain threshold of trigger point and range of motion of cervical spine . Improvement was noted with both dry needling and injection of local anaesthetic agent .The author concluded injection of local anaesthetic agent is preferable as it produces less postinjection soreness.

Conclusions

Muscle pain is a common presentation of patients in Physical Medicine and Rehabilitation department. By careful history taking , physical examination and laboratory investigation cases can be divided into myofascial pain syndrome with localised symptom and fibromyalgia with diffuse ache and systemic affection.

Presence of taut band , nodule and trigger point help in diagnosis of myofascial pain syndrome and presence of multiple tender points distributed around the whole body along with systemic complaints points to fibromyalgia.

It is worthy of trying local needling and infiltration in cases of myofascial pain syndrome. In cases of fibromyalgia the procedure is of no value and other treatment modalities can be tried.

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Progressive Muscular Dystrophy A New Clnical Sign

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Abstract

Meryon gave the first description of progressive muscular paralysis in 1852. Later, Duchenne gave complete description of progressive muscular dystrophy (PMD) in 1868, now disorder has been given his name. Gowers provided the first comprehensive details in English in 1879. Both Duchenne and Gowers emphasized the pseudohypertrophic enlargement of certain muscles.

P.M.D. is a primary progressive degeneration of the musculature of the body of unknown etiology. P.M.D. is the commonest muscular dystrophy having x-linked recessive inheritance and usually affects males. In the early stage or in doubtful cases, accurate diagnosis should be made after proper clinical examination and investigations like estimation of creatine kinase (CPK), serum aldolase, electromyography (EMG) and histopathological examination of muscle.

Incidence

The incidence of Duchenne muscular dystrophy ranges from 13 to 33 per 100,000 live born males and its prevalence in population varies from 19 to 39 per 100,000.

Symptoms

Usually parents describe clumsiness in walking and frequent falls in the affected child. In many cases, walking is delayed. Whereas in other cases, child is apparently normal until third year and parents do not report any abnormality. Later child shows laziness or pesplanus and inability to run, followed by increasing difficulty in climbing stairs and also in raising from floor by climbing upto legs, to attain standing position (Gowers sign). Later child walks with waddling gait.

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The wasting is seen in musculature of proximal part of upper and lower limbs alongwith muscular hypertrophy is present in calves. Weakness of hip and knee extensors is observed followed by weakness around shoulder girdle. Contracture develops usually in tendoachillus & flexors of hip and knee.

A new clinical sign has been observed in these cases due to atrophy of Brachioradialis muscle.

Technique

The upper limb is kept on the side of the chest and elbow at 90^{o}, along with forearm in mid-prone and then the child is asked to flex the elbow against the resistance on the forearm. Normally there is bulge or prominence of belly of a brachioradialis.

A positive sign means that there is no bulge or prominence of belly of brachioradialis

(photograph 1). A negative sign means that there is bulge or prominence of belly of brachioradialis (photograph 2).

The weakly positive sign means that there is mild bulging of belly of brachioradialis.

photograph 1

photograph 2

Discussion

This new clinical sign (Agarwal's sign) has been observed practically in all cases of already proved PMD who have attended O.P.D. of Department of Physical Medicine and Rehabilitation, RALC, K.G. Medical College, Lucknow from August 1997 till April 2002. During this period a total of 36 cases of PMD have been documented wherein this new clinical sign was observed.

This new clinical sign (Agarwal's sign) is simple, easily detectable and requires no tools or special training. Further elicitation of this new sign requires less exposure of the upper limb and hence suitable for young girls as well. It has been observed in cases of Myopathy where there is minimum hypertrophy of calves, the new clinical sign was positive.

The positive sign denotes complete atrophy of brachioradialis whereas negative sign denotes normal bulge of brachioradialis.

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Adolescent Osteomalacia as a Cause of Low Back Pain In Young Female

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Abstract

10 young female patients presenting with low back pain and generalised bodyache were considered for the present study. They were examined physically and investigated biochemically and radiologically. All the cases were diagnosed as osteomalacia. They were treated with single dose of parenteral Vit.D and oral calcium supplementation. All of them improved clinically, biochemically and radiologically within two months. Some of them had residual pain at one month. Oral supplementation of calcium was continued in those cases for another one month. In addition advice regarding proper diet and importance of exposure of sunlight was given to every patient to prevent recurence of osteomalacia.

Key Words : Osteomalacia - Adolescent - Female - Drug Treatment

Introduction

Low back pain is a common complain of female adolescent patients attending Physical Medicine and Rehabilitation Department. History of trauma is usually lacking. Some of the patients have additional symtoms of bodyache, gait disturbances and difficulty in standing from squatting position. On examination, bony and muscle tenderness is usually found in addition to painful spinal movements.

The present study was conducted to know cause of such presentation and the treatment procedure to be used for the benefit of such patients.

Materials and Methods

The study was conducted in the department of Physical Medicine and Rehabilitation of Medical College, Kolkata. A total of 10 adolescent females having long duration low back pain as the main complain were considered for the study. Some of the members also had additional symtoms like bodyache and gait abnormality. In each patient a detailed history was taken along with clinical, biochemical and radiological examinations to ascertain the cause. In addition routine blood and urine examinations were done in every case. All the patients were diagnosed as having osteomalacia.

They were treated with single dose of 6 lakh units IM Vit.D and oral calcium 500mg twice daily. They were evaluated periodically at one month and at two month after the first visit. In patients with residual symptoms at one month, oral calcium supplementation was continued for another one month. Each patient was adviced regarding proper diet and sunlight exposure.

Observations and Results

All cases in the above study were below 17 years, mostly between 14-16 years. All the cases were female. It is interesting to note that all the

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Table 1 : Showing characteristics of patients.

Sl. No.	*Name of the Patient*	*Age in Years*	*Sex*	*Marital Status*	*Religion*	*Duration of Illness*
1.	Reshma	14	Female	Unmarried	Muslim	5 months
2.	Sahina Parveen	14	Female	Unmarried	Muslim	6 months
3.	Punam Ikbal	16	Female	Unmarried	Muslim	7 months
4.	Susma Ikbal	17	Female	Unmarried	Muslim	2 months
5.	Tarannu Begam	12	Female	Unmarried	Muslim	2 months
6.	Sabnam Parveen	12	Female	Unmarried	Muslim	6 months
7.	Afsana Khatoon	14	Female	Unmarried	Muslim	1 year
8.	Ruksana Khatoon	14	Female	Unmarried	Muslim	6 months
9.	Rahina	13	Female	Unmarried	Muslim	4 months
10.	Nurjaha	14	Female	Unmarried	Muslim	9 months

Table 2 : Showing financial and social distribution of the patients.

Total family members of the patient			*Rooms shared by the family members of the patient*		*Total income of the family of the patient per day in rupees*		
<5	5-10	>10	1 room	2 rooms	< 50	50-100	>100
0 patient	10 patients (100%)	0 patient	7 patients (70%)	3 patients (30%)	2 patients (20%)	5 patients (50%)	3 patients (30%)

cases were of Muslim community. All of the patients were unmarried (Table 1)

All the subjects of the study were members of large family living in one or two crowded rooms and consuming nutritionally deficient diet due to meagre family income (Table 2).

Only one patient had been consuming anticonvulsant for control of epilepsy for last 7 years.

Initially serum alkaline phosphatase was found to be high, whereas serum calcium and phosphate were found to be below normal in all cases. As a result of treatment patients improved physically and biochemically early but radiological improvement took some time. But after two months of treatment, all the patients improved physically, biochemically and radiologically (Table 3).

Radiograph showed looser zone especially in pelvis (Fig. 1) which disappeared following treatment (Fig. 2).

Fig. 1 :Photograph of Pelvis showing looser zone in the right superior pubic ramus.

Table 3 :

Sl. No.	*Radiological Assessment*		*Serum Calcium Level (mg/dl)*		*Serum Phosphate Level (mg/dl)*		*Serum Alkaline Phosphatase Level (U/L)*	
	At Entry (Looser Zone-present or not)	*At 2 month (improvement noticed or not)*	*At Entry*	*At 2 Month*	*At Entry*	*At 2 Month*	*At Entry*	*At 2 Month*
1.	Present	Yes	7.9	9.4	2	2.8	550	306
2.	Present	Yes	8	10	2.3	3.8	350	295
3.	Present	Yes	8.1	9.3	1.8	3.9	510	300
4.	Present	Yes	7.9	9.5	2.1	2.9	720	309
5.	Present	Yes	8.2	10.1	2.2	3.2	375	260
6.	Present	Yes	8	9.4	1.9	3.8	500	290
7.	Present	Yes	8.3	9.5	2.1	4	430	301
8.	Present	Yes	8.5	9.8	1.8	2.8	480	308
9.	Present	Yes	7.8	9.6	2	3.1	400	270
10.	Present	Yes	8.4	9.7	1.9	3.5	410	280

Fig. 2 :Photograph of Pelvis showing looser zone in the right superior pubic ramus.

Discussion

Low back pain in an adolescent female is a common presentation in physiatric practice. If low back pain is present for a long time especially in a female of low socioeconomic status and they fail to improve with NSAID and exercise, osteomalacia should be thought of as a possibility. Osteomalacia and Rickets are disorders in which mineralisation of the organic matrix of the skeletal is defective. In Rickets growing skeletal is involved. The term Osteomalacia is reserved for disorders in audults in whom epiphysial grouth plate is closed[1].

Aetiologies of osteomalacia are (1) Dietary deficiency of Vit. D. (2) Inadequate exposure to sunlight (like women in purdah). (3) Chronic renal diseases. (4) Chronic intake of antiepileptic drugs[2]. Adolescent period starts from the onset of puberty and ends till sexual maturity is complete. It can be divided into prepubescent, pubescent and post pubescent period. It extends from 10 to 18 years in male and 12 to 20 years in female[3]. None of the patients in the present study used purdah in contrast to the study of EL-Sonbaty-MR et.al.May 1994[4]. One of the patients used anticonvalsant for 7 years, which may be cause of Osteomalacia[2]. Biochemical examinations showed increased alkaline phosphatase and reduced levels of serum calcium and phosphate that is in corroboration with the study of Oliveri-B et.al.1999[5]. Less exposure to sunlight can cause Rickets and Osteomalacia[6]. All the members were found to be residing in over-crowded slums of Kolkata getting less sunlight exposure that contributed to causation of

osteomalacia. In addition all the patients were found to depend on meagre family income, which is the cause of nutritional deficiency leading to osteomalacia[2].

It is interesting to note that all the cases in the present study were muslim. That does not mean that osteomalacia does occur in young muslim female only. Patients in the present study came from slums surrounding medical college, Kolkata where maximum mumber of peoples are muslim and they live in underexposed overcrowded rooms and they do not get even minimum nutritious food required to prevent osteomalacia (Table 2). Again female predominance also proves our social injustice to female. Females get little share of the food available in the family, as male member are previleged to get maximum amount of food. Thus socio-economic background and not religion is importment for causation of osteomalacia.

Though 400-1000 I.U vit.D per day and calcium supplementation is effective in osteomalacia[7], single parenteral dose of 6 lakhs units of vitamin D was administered in this study considering lower socio-economic status of the patients. In addition, importance of dietary advice and exposure to sunlight was not ignored, as they would prevent recurence of osteomalacia. Though bed rest along with plenty of milk and sunlight exposure may have definite role in treatment, rigid bed rest was never advised considering socio-economic background of the patients as they were bound to do normal household activities. But they were advised to avoid vigorous exercises. Serum vit.D estimation could not be done due to lack of facilies.

All the patients improved clinically, biochemically and radiologically within 2 months of initiation of treatment. In all cases improvement of general health and mode of the patients were also perceived. With oral vit.D, radiological evidence of healing is first noted within weeks[8]. The process of healing in the present study was probably hastened due to single high dose of parenteral dose of vit.D instead of daily low dose of oral vit. D.

Conclusion

From the present study it is found that in case of adolescent female of lower socio-economic status who are underexposed to sunlight and are presented with prolonged low back pain with or without symtoms of myalgia and gait abnormality, osteomalacia should be considered as one possibility. Parenteral single dose of vit.D and oral supplementation of calcium can give good result in establised cases of osteomalacia.

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Study of Quantitative Assessment of Spasticity by Isokinetic Dynamometry

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Abstract

Spasticity is defined as velocity dependent increase in tonic stretch reflexes with exaggerated tendon jerks resulting from hyperactivity of stretch reflex. It is important to quantify spasticity to know the improvement following treatment. The present study was aimed at quantitative assessement of spasticity by using isokinetic dynamometer.

A group consisting of 12 cases with measurable spasticity due to various causes were compared to 12 able bodied controls. These measurements were made using isokinetic dynamometer. Ashworth scale was used for grading the spasticity before testing on the machine. Maximum peak torque was measured while the limb was passively moved in flexion and extension at knee joint at speeds of 30, 60 & 120 degree / second. On analysis, there was no significant difference between right and left sides. The maximum peak torque was higher in cases than controls at all angular speeds tested ($p<0.05$).These values increased with increase in speed of movement of the limb. Flexion torque (FT) at 30 degree per second was significantly higher than the extension torque (ET) ($p<0.05$). In the control group there was no significant difference between FT and ET.

Spasticity could be quantified using isokinetic dynamometer which correlated well with the Ashworth scale.The effect of any medication or intervention may be known using this method.

Key words: Isokinetic dynamometer; Maximum peak torque; Flexion torque; Extension torque.

Spasticity is difficult to characterize than to recognize and still more difficult to quantify[1]. Spasticity is very easily detectable by clinical examination but there is no effective method of quantifying muscular tonus inspite of the continuous efforts. Quantification is important to know the response to medication and evaluate the progression of the disease. Various neurophysiological and biomechanical methods have been used in various centers. Ashworth scale is the simplest one to grade spasticity by passively moving the limb. But this method is highly subjective. Here, in the present study we have made an attempt to quantify spasticity using isokinetic dynamometer (Biodex system II) in patients with clinically detectable spasticity and compared with the control group.

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Materials and Methods

A total number of 12 cases of any age and of either sex with clinically detectable spasticity were included in the study. The patients were selected from the out patient department of Physical Medicine and Rehabilitation, AIIMS, New Delhi. Out of these 12 cases, 10 cases had complete traumatic spinal cord injury and 2 cases presented with hemiplegia following cerebrovascular accident. All the cases selected had clinically detectable spasticity without any history suggestive of knee trauma or disease. Control group consisted of 12 subjects with age and gender matched to the cases and without any neurological

disease or knee injury. Isokinetic dynamometer (Biodex system II) was used for the measurement of resistance to passive movement of the knee joint.

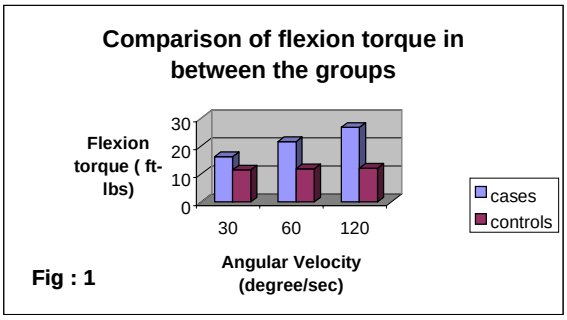

Fig : 1

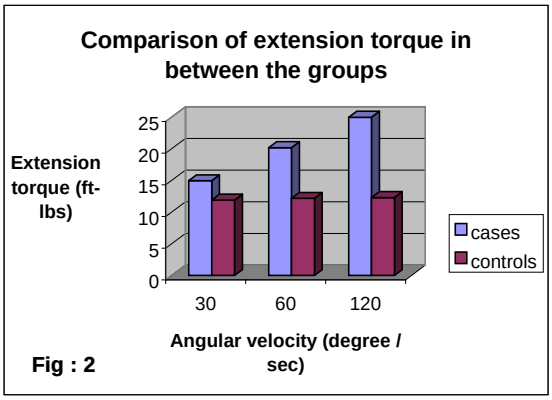

Fig : 2

All the patients were informed about the experiment's procedure and positioned properly by adjusting the height of the dynamometer persuing congruence between the dynamometer's axis and the axis of the knee joint. Patients were stabilized by restraining straps at the level of the chest, around the abdomen and thigh. The force acceptance unit was attached 5cm above the lateral malleolus. Test program is selected after feeding in the general information about the patient, joint tested, movements (flexion and extension) tested and side tested. After setting the range of motion, the evaluation mode is turned into passive mode. Resistace to passive movement of the knee joint during flexion and extension, measured as eccentric torque is recorded at speeds of 30^{o}, 60^{o} and 120^{o} per second with resting period of 10seconds and 5repetitions each. Maximum peak torque value measured in foot-pounds was considered for comparison between the cases and the control group. As spasticity is highly variable, Ashworth scale was used for grading spasticity just before being tested on the machine. This grading was done by a single subject to avoid subjective variability. Both the limbs were tested in all the patients. On an average it took around 20minutes for each test and were performed by a single operator. The able bodied subjects in the control group were asked to keep their knees relaxed as much as possible and not to interfere with the passive movement of the knee joint.

Results

On analysis of the available data, the mean age of cases and controls at presentation was comparable ranging from 17-56years.Mean age of cases was 34.5 ± 11.36 (17-56) and that of controls was 35.0 ± 11.72(20-56).Male patients were more than the female patients with a ratio of M:F=10:2 indicating higher incidence of spinal cord injury in males.

Cause of spasticity was spinal cord injury in 10 patients and cerebrovascular accident in 2 patients. On grading of spasticity according to ashworth scale, four patients presented with grade1 spasticity, six patients with grade 2 and two patients with grade 3.No significant differences were found between right and left sides tested.

The torque value measured during extension movement of the knee joint is the eccentric torque value of the hamstring muscles (ET) and the one measured during flexion movement of the knee joint is the eccentric torque value of the quadriceps muscle (FT). Maximum peak torque recorded was 34foot-pounds (FT120) which was the flexion torque at angular speed of 120 degree per second. The maximum peak torque value was higher in the cases than controls at all the angular speeds tested ($p<0.05$) on student t test analysis. Torque values increased with increase in the speed of

movement of the limb. Flexion torque was more than the extension torque at 30degree (FT30>ET30) with high significance ($p<0.05$). Flexion torque at 60 and 120 degree per second was also higher compared to the extension torque. However the values were not significantly higher. Comaparison of flexion torque in between the cases and control group is shown in Fig : 1and that of extension torque is shown in Fig: 2. In the control group there was no significant increase in the torque values with increasing speeds and no difference was found between flexion torque and extension torque.

Discussion

Stretch reflex is velocity dependent frequently presenting a linear interrelation which seems to increase with the degree of spasticity[2]. Stretch reflex reduction due to fatiguability on repeated testing has been shown previously[3]. So the test is carried out with 5 repetitions at each speed and at 30 degree initially followed by 60degree and finally at 120 degree per second.

There are various techniques of study of assessment of spasticity. The neurophysiologic techniques include H reflex and the tendon jerks[4,5]. The ratio of H(max) and M(max) is more sensitive than the amplitude of H reflex alone[6]. Tendon jerks are elicited by tapping with a patellar hammer when the patient is relaxed. Biomechanic methods for assessing spasticity include gravitational method,[7,8,9] manual method which is passively moving the limb, controlled displacement method and controlled torque method[10].

The controlled displacement method was used in the present study. In this method, velocity remains constant and so the displacement. But the torque value varies each time depending upon the resistance felt while passively moving the limb. Advantage of controlled displacement method is that the velocity and range of motion can be standardized and controlled. The ability to vary velocities allows for the evaluation of rate dependent characteristics of muscle tone[11].

In the present study, there was no significant difference between FT and ET at 60 and 120 degree per second but FT30 was more than ET30 in cases. Study by Franzoi et al 1999[12] showed higher FT values compared to ET in the control group. In our study there was no significant difference between FT and ET in the control group.In a study by firoozbakshi et al[5] in 1993 FT>ET at all the speeds in the spastic group..

Torque values were more compared to the control group especially at higher speeds. This finding is consistent with the other 2 studies. We have considered maximum peak torque values for comparison in between the groups.

Usually quadriceps muscle is strongly affected by spasticity as shown by Vodovnik et al[13] in 1984.This explains higher FT than ET. Higher the grade on ashworth scale higher was the torque value. This means when the spasticity is more the eccentric torque value increases. The torque values correlated well with ashworth scale.

Spasticity can be quantified effectively by using isokinetic dynamometer. This can be repeated very easily and the values can be compared over time. The efficacy of medications or any other interventions can be tested by estimating the torque values before and after the procedures. Higher speeds are more useful than the lower speeds.

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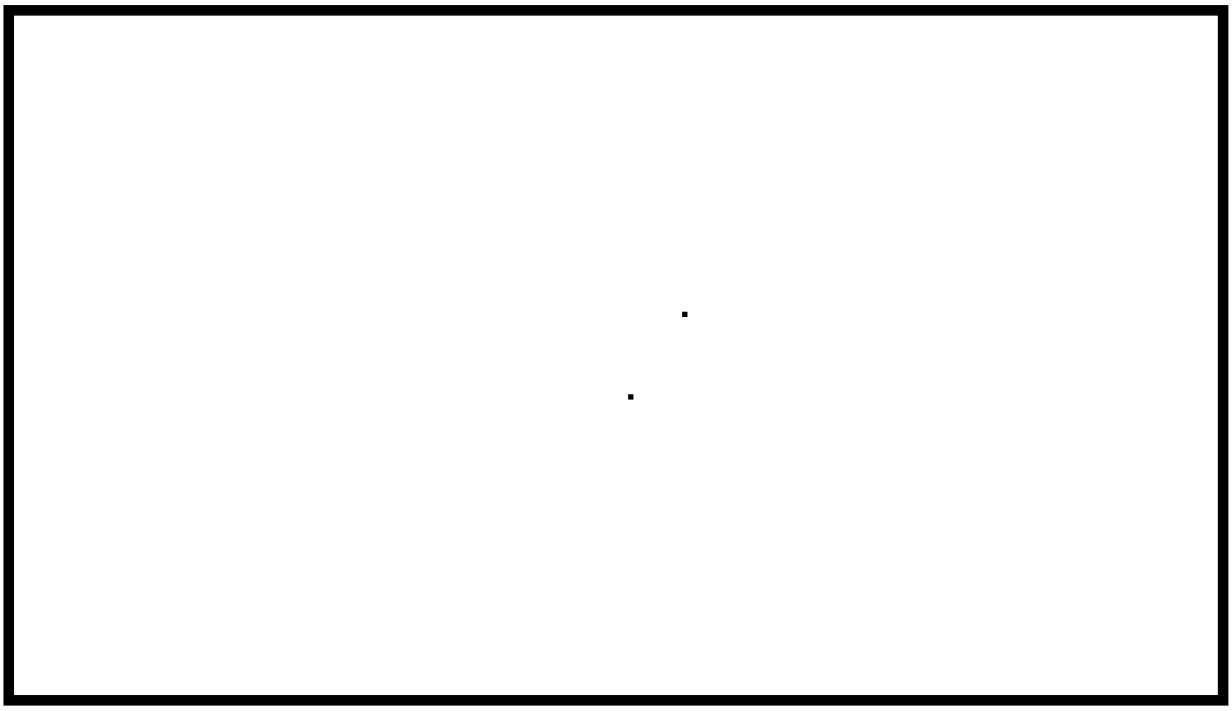

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Spinal Tuberculosis :Presenting as Retroperitoneal Lymphadenopathy, Obstructive Uropathy, Chronic Renal Failure, and Back pain - A Case Report

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Abstract

More and more cases of back pain are being referred for rehabilitation due to better outcome of rehabilitation measures. A correct diagnosis is the most important deciding factor for accurate management. The tendency to oversimplify back pain can often lead on to serious complications.

A young male patient with a diagnosis of chronic renal failure with outflow obstruction under investigation for cause of anaemia was referred to Deptt. of Physical Medicine and Rehabilitation for management of back pain. On detailed assessment, he had dull low back ache for 2-3 years which aggravated over past eight months. The pain was tolerable and disturbing problem was retention of urine and inability to void at will. He had grade 3 tenderness over lower thoracic and lumbar vertebral spinous processes and severe paraspinal muscle spasm. There was mild exaggeration of thoracic kyphosis. His preliminary investigations revealed anaemia, elevated erythrocyte sedementation rate (ESR) and impaired renal function. Skiagram of thoracolumbar spine showed reduced heights of T12 and L1 vertebral bodies and decreased disc spaces between T11-T12 and T12-L1 vertebrae. C.T. scan of thoracolumbar spine revealed severe destruction of T12, L1 and L2 vertebral bodies with pre and paraspinal soft tissue mass with an epidural extension and retroperitoneal lymphadenopathy. With the initiation of antituberculous treatment (three months) patient had some clinical improvement and is still under close follow up.

Though spinal tuberculosis is a common cause of back pain, the symptoms and signs are often masked. There are various reports of unusual presentations of spinal tuberculosis. A strong clinical suspicion and systematic approach to the patient's problem is the key to correct diagnosis, lack of which might cause serious unwarranted complications.

Introduction

Back pain is a very common problem for which patients seek a Physiatrist's help. Most of the patients are referred by a specialist in some other field for rehabilitation and they might have a certain diagnosis. This case report points out that, a detailed assessment of the patient along with the relevant investigations and confirmation of the diagnosis is mandatory before initiation of therapy to avoid serious complications.

Tuberculosis of the spine has to be considered in the differential diagnosis while evaluating a case of back pain especially in a young adult. Vertebral tuberculosis is the most common form of skeletal tuberculosis. However, usual symptoms and signs may be absent even in cases of active vertebral disease[1].

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A case is reported where the complications of spinal tuberculosis were the prominent problems for the patient. The primary pathology which is curable went undetected.

Case Report

History

A twenty four year old male patient was referred from the Renal clinic to the Deptt. of Physical Medicine and Rehabilitation for management of back pain. Patient had the following complaints.

- Dull low back ache for two to three years and aggravated for eight months.
- Difficulty in initiation of micturition for one year

The patient had dull ache over his lower back which he found was tolerable. There was no radiation of pain either to the lower limbs or to the abdomen and he did not notice any tingling sensation or numbness over his feet. During the past eight months, he has noticed that pain aggravated while sitting or standing for a long period of time and that the pain was relatively more at night. He had occasional episodes of low grade fever which was difficult to quantify. There was no history of cough with expectoration. He did not report loss of weight or loss of appetite but malaise was present. A family history of tuberculosis could not be elicited.

During this period, the patient developed difficulty in initiating micturition. He had normal bladder sensations and adequate sphincter control but could not initiate voiding. This problem alarmed him and immediately he seeked the help of a Urologist. He was being investigated and treated at Urology and Nephrology departments. With the above features in mind, the patient's clinical condition was assessed in detail.

Clinical Examination:

The patient had mild pallor on general examination. Generalized lymphadenopathy was absent. He was afebrile and blood pressure was within normal limits. His respiratory system was clear with no added sounds. Liver and spleen were not palpable per abdomen and there was no free fluid. Cardiovascular system was within normal limits.

Mild exaggeration of thoracic kyphosis was observed with apex approximately at T12-L1 level. Grade 3 tenderness was elicited on palpation over the spinous processes of vertebrae from T12 to S1 levels. There was severe spasm of paraspinal muscles bilaterally with associated tenderness. There was no renal angle tenderness. Thoracolumbar mobility was grossly restricted in all directions due to pain. No tenderness or restriction of range of motion (ROM) was noted in the cervical spine. Examination of both his lower limbs did not reveal any neurologic deficit and there was no perianal anaesthesia.

Bladder evaluation revealed a large capacity bladder with good compliance and significant PVR. Sphincter EMG (Electro myography) was not performed. Patient was practicing clean self intermittent catheterization (CSIC) technique at three to four hour intervals for voiding and there was no dribbling in between. The occasional difficulty in passing stools was managed with stool softeners and laxatives.

He had the following reports with him during his first visit (Table. 1).

Parameter	6-5-02	5-6-02(start ATT)	3-9-02	25-11-02
Hb	8.1	7.8		
T.C.	9200	7400		
D.C.	N64L33E2M1	N72L26E1M1		
Platelets	162x10^3/Cumm	217		
ESR	46mm	60		
Urea	97	96	135	135
Creatinine	5.9	4.4	4.8	4.4
Na/K	146/4.8	140/5.8		146/4.9
Ca/P	9.1/5.4	8.9/5.9		8.3/4.5
Bili. Tot	2.5		0.5	0.6
Con/un	1.0/15			

Tot.Prot	7.2		7.4	7.5
A/G	4.0/3.2		3.8/3.6	3.9/3.6
SGOT/SGPT	22/11		13/18	61/66
ALP	156		146	292
Urine Prot.	++			
Bacteria	+++			
RBC	5-6/HPF			
WBC	30-40			
24 Hr.urinde AIB.	6.0 gm			
Creat.	1400u			
Urine c/s	E.Coli	E.Coli		

His ultrasonogram (USG) of kidney, ureter and bladder (KUB) showed mildly enlarged kidneys bilaterally with moderate hydronephrosis and diffuse parenchymal thinning. There was irregular thickening of wall of the urinary bladder with significant post-void residual (PVR) volume. Radiologist gave a diagnosis of features suggestive of neurogenic bladder.

Micturating cysto-urethrogram (MCU) revealed large capacity bladder with very significant PVR.

HBs Ag and HIV tests were negative.

The patient was prescribed Amlodepine 5mg daily for control of his hypertension.

Investigations:

This patient's prior investigation reports could not explain all the clinical findings and so he was further investigated to find out a cause for his back pain which revealed microcytic hypochromic anaemia, raised ESR and elevated serum urea and creatinine levels (Table. 1)

- Skiagram of thoracolumbar spine: Exaggerated thoracic kyphosis and loss of lumbar lordosis, decreased disc space between T11-T12 and T12-L1 vertebrae. Reduction in the heights of vertebral bodies of T12 and L1 vertebrae was marked.
- Non contrast computerized tomography (NCCT) of thoracolumbar spine: There was evidence of severe destruction of T12, L1 and L2 vertebral bodies. Some erosion was noted in the body of T10 vertebra. There was pre and paraspinal soft tissue mass with an epidural extension ranging from T12 - L2 level causing significant thecal sac compression. There is severe bilateral hydronephrosis and retroperitoneal lymphadenopathy (Figures 1,2).

Fig : 1

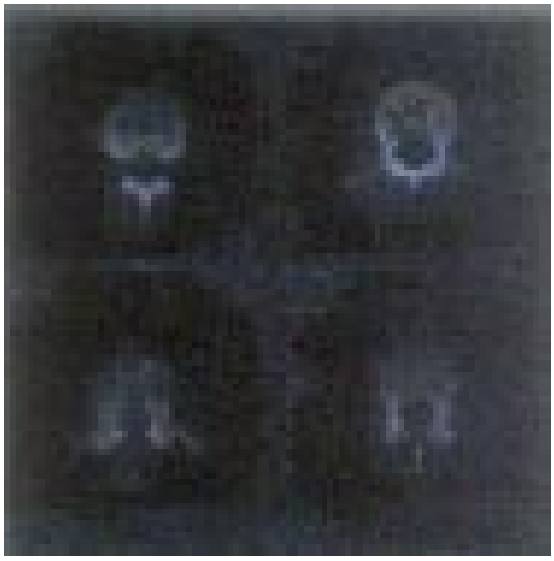

Fig : 2

These findings led to the diagnosis of tuberculosis of the spine (Pott's disease) with retroperitoneal lymphadenopathy, obstructive uropathy, chronic renal failure and renovascular hypertension.

As soon as the diagnosis was established, the patient was started on antituberculous drugs under nephrologist's supervision. Analgesics and antihypertensives were continued. Orthosis was given to support thoracolumbar spine.

After about 6 weeks of therapy, patient had some symptomatic improvement in back pain and is back to his vocation but there has been no improvement in his bladder status and hypertension.

He is on regular follow up with PMR and Nephrology departments.

Discussion

Vertebral tuberculosis (TB) is the most common form of skeletal tuberculosis, and it constitutes about 50% of all cases of tuberculosis of bones and joints, 15% of extra pulmonary TB and 2% of all cases of tuberculosis[1-4]. It is most common during the first three decades. The usual clinical symptoms in active stage of the disease are malaise, loss of appetite, loss of weight, night sweats and evening rise of temperature. A stiff spine, painful on movement and tender on percussion with localized kyphotic deformity and spasm of the vertebral muscles are the usual signs. A cold abscess may be present. A history of tuberculosis in the family may or may not be present. However, several of these symptoms and signs may be absent even in cases of active vertebral disease[1]. There are various reports of unusual presentations of spinal tuberculosis[5-10]. In our experience, though the patient had some of the features at examination, which could easily have been overlooked due to the diagnosis of a chronic renal disease. Moreover, they might have been masked at his initial visit to the nephrologist.

Wedge et al reported a delay from onset of symptoms to diagnosis of at least three months in one third of their patients with spinal osteomyelitis- both pyogenic and tubercular and they attributed this to the failure of the initial physician to consider osteomyelitis in the differential diagnosis of back pain associated with a febrile illness[8]. This was the cause of delay in diagnosis of our patient also.

C.T. scan of the spine was considered confirmatory of tuberculosis. Though many authors[9,11-14] have reported atypical presentations in C.T., we observed classical findings in our patient - paradiscal lesions characterized by destruction of the adjacent bone end plates of the bodies and diminution of the intervening disc[1] which progresses to adjacent vertebral collapse. In such case, bacteriological examination is often unwarranted.

In our case, patient reported first to the nephrology out patient department (OPD) with prominent and disturbing urinary complaints. Agarwal and Dash in their work, Spectrum of renal diseases in Indian adults concluded that chronic renal failure(CRF) was the diagnosis of most of the patients attending nephrology OPD. They added that as CRF in young adult male patients is the largest load, with its wide social and economical implications in the Indian context, we must gear up to organize ourselves for providing the best possible care to these patients with the limited resources[15].The misdiagnosis was probably due to over simplification of back pain, presuming that it might be due to the renal problem and not considering or assessing back pain and its cause. The patient was at risk of developing paraplegia if it was not detected at this stage (stage III of clinicoradiological staging of spinal tuberculosis).

Tuberculous abdominal lymphadenopathy has been repoted to cause renovascular hypertension in a few case reports which reversed with anti tuberculous treatment[5,6]. Our patient did

not undergo renal angiography to determine the cause of hypertension but is on regular follow up and blood pressure is being monitored.

Jackson and Kemp in their letter said that in the majority of patients especially in older age groups, it is not easy to establish the diagnosis with any degree of accuracy despite the availability of modern diagnostic methods[16]. This is true even at present especially in the early stage of the disease. A strong clinical suspicion is the key.

Conclusion

Tuberculosis of the spine, though a common condition, is misdiagnosed due either to various atypical clinical presentations or atypical radiological findings. It can also be missed if the physician who sees the patient at first visit does not suspect tuberculosis as a possible cause. Thus, in a young adult, with back pain, a systematic and thorough assessment along with a strong clinical suspicion and relevant investigations is the key to diagnosis of spinal tuberculosis inspite of features pointing towards other diagnoses.

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Idiopathic Hypereosinophilic Syndrome with Stroke in Young: A Case Report

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Abstract

Idiopathic hypereosinophilic syndrome (IHES) is a rare disorder with prolonged eosinophilia of unknown cause with an organic dysfunction. It is associated with eosinophil induced neurological deficit, pulmonary fibrosis and gastrointestinal abnormality. A case of 30-year-old man with IHES who developed cerebral infarction with organic dysfunction is reported. Treatment with prednisolone resulted in reduction of peripheral eosinophil count and marked improvement in his CNS dysfunction. The pathophysiology of the disorder is also discussed.

Introduction

Eosinophilia is associated with various organ dysfunctions due to many underlying causes. The common causes for eosinophilia are parasitic infestations, allergic diseases, neoplasias and vasculitis syndromes[1]. Patients in whom no known underlying cause of eosinophilia can be proved and who continue to be have absolute eosinophil count of more than 1500/cumm for more than six months with a organic dysfunction can be labeled as idiopathic hypereosinophilic syndrome (IHES). Patients who suffer from IHES develop many neurological abnormalities, the common are recurrent stroke, encephalopathy, peripheral neuropathy and seizures. Due to the rarity of the cases we would like to report a case of IHES who developed stroke with seizures and the effective treatment given after long follow up.

History

A 30-year-old male was referred to PMR OPD from neurology with history of sudden onset of weakness in the right half of the body with inability to speak for three months. There was no history of trauma at the time of onset, no history of seizures, and no history suggestive of raised intracranial tension. There was no history of difficulty in breathing, cough, skin rash, nasal allergy or any other history suggestive of worm infestation. He was admitted to the local hospital in the acute phase and CT scan of brain was done, which revealed infarction in the left middle cerebral artery territory. He was discharged along with advice to take aspirin and enalapril. He started with gradual recovery of function in right upper limb initially, later in right lower limb. There was a marked recovery in his motor functions after 3 months, he was able to stand and walk independently but was unable to speak. He was brought to OPD of Neurology in the month of June 2001 for his speech problem and weakness in right half of the body. Again the routine investigations, carotid doppler and echocardiography was done which were normal. He was diagnosed as stroke in young with unknown cause and referred to PMR OPD for further management.

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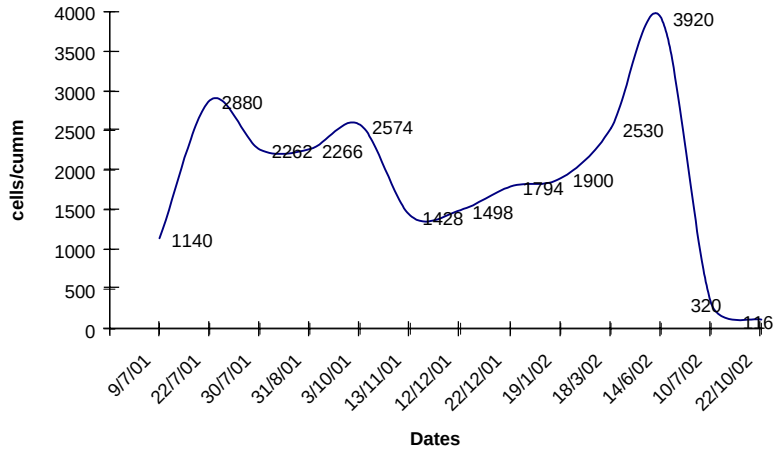
At the time of initial evaluation in PMR OPD general physical examination was normal with blood pressure 130/90. He was conscious, co-operative and well oriented. He had right seventh nerve upper motor neuron palsy with motor aphasia. Right upper limb and lower limb had spasticity of grade-II. Motor power of 3/5 was noted in right upper and lower limbs with weak right hand grip. Deep tendon reflexes were brisk with positive Babinski sign and gait was hemiplegic. Examination for the cardiovascular system, respiratory system and per abdomen was normal.

Initial investigations revealed Hb: 14gm%, TLC: 11400/cumm (N-70%, L-20%, E-10%) ESR: 27mm/1st hour, SGOT: 111 IU, SGPT: 157 IU other liver functions tests were normal. Repeated absolute eosinophil count was 2680/cumm. Patient was admitted in the PMR ward to find out the cause for raised absolute eosinophil count and stroke in young. Again the repeated AEC was 2266/cumm, and investigations for parasitic infections (mid night sample for filariasis, stool examination) came negative, chest-x ray and urine examination were normal. Investigations for connective tissue disorders (RA Factor, ANA, Anti-DS DNA) and anti phospholipid syndrome (Acl: 5 GPL units/ml, Anti thrombin-III: 80µl, (protein C: 100% and Protein S: 78%) were negative. Bone marrow biopsy revealed no results. Due to the raised AEC his antihypertensive medication (Enalapril) was changed to tab: amlodepine and other medications were continued. There was a short drop in AEC (Fig: 1) after ingestion of diethylcarbamazepine and change of enalapril.

He was discharged and followed up in OPD of PMR regularly. Patient developed seizures in the month of October 2001, Jan & Feb 2002, for which he was started with phenytoin sodium 100mg BD. The seizures got controlled but his AEC count was persistently elevated. In the mean time he was given range of motion exercises, hand strengthening exercises, gait training with ankle foot orthosis, facial muscles exercises and speech training. His speech improved to an extent and his handgrip was also showed improvement.

In the month of June 2002 again the bone marrow aspiration and biopsy was repeated. Bone marrow touch preparation revealed 27% eosinophils along with haematopoietic cells of series and normal blast cells. Biopsy showed normocellular hematopoetic elements of all three series with myeloid preponderance with eosinophilic precursors were prominent. Due to the persistent raise of AEC (more than 1500 cells/cumm) for more than ten months with involvement

Chart 1: Absulute Eosinophil Count



of the liver he was finally diagnosed as a case of Idiopathic hypereosinophilic syndrome with stroke in young. He was started with prednisolone 50mg OD and the older medications were continued along with exercises and ADL advice. Just after one month of therapy his absolute eosinophil counts reduced dramatically to 2%. Prednisolone was continued in the same dose for 3 months and later tapered. Now patient is on 10mg of prednisolone daily along with ranitidine and calcium carbonate, other medications (amlodepine and aspirin) were continued.

Discussion

This patient initially had normal hematological and liver function tests. Because of no abnormality was found in laboratory findings he was treated just like any other cases of stroke in young. He developed the laboratory abnormality and raised eosinophil count only after three months of onset of stroke. There was no evidence of any worm infestation. Once the worm infestation was ruled out we stopped the enalapril and started with amlodepine. Barnes JN[2] reported a case of chronic renal failure, which was on enalapril therapy and developed eosinophila. Inspite of this change in therapy AEC count was markedly elevated. Repeated bone marrow biopsy also ruled out the eosinophilc leukemia and confirmed the IHES. We started treatment with oral prednisolone as reported by Weaver et al[3] and observed dramatic response just after one month of therapy with an almost normal eosinophil count.

Eosinophils exert non-specific toxic effects that induce tissue damage to host tissues. The central and peripheral nervous system are frequent recipients of this misplaced toxicity; the resulting phenomenon is called eosinophil induced neurotoxicity (EIN). The mechanisms of eosinophil induced neurotoxicity are (1) direct neural tissue infiltration; (2) damage related to eosinophil function either by direct cytotoxicity or by antibody dependent cellular cytotoxicity; (3) damage related to eosinophil products secretion; (4) embolic cerebral infarction related either to thrombi or generalized hypercoagulable state and (5) nervous system damage secondary to eosinophil-mediated damage in remote organ systems[3]. Wassom et al reported that eosinophilc major basic protein causes endothelial damage and by this the tissue damage. In this case vasculitis or antiphospholipid syndrome as a cause for stroke is unlikely as all laboratory findings for these disorders was normal. It's likely that the neurological deficit in this case is due the damage caused by products derived from eosinophilia. An eosinophilic cationic protein has been reported to have a profound effect on coagulation system and this protein has also been shown to be responsible for thromboembolic phenomena[4]. There are several reports on the best therapy for IHES[5], alpha interferon, hydroxyurea and prednisolone are commonly used. But till now the most effective single treatment is with prednisolone. This case also responded well for prednisolone therapy.

In conclusion this is a unique case that had elevated eosinophil count after the development of neurological deficit. Long term follow-up and high index of suspicion is required to establish and treat a rare disorder.

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Observations on Rehabilitation of Peripheral Nerve Injuries in Kashmir Valley

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Abstract

Peripheral nerve injuries were commonly observed in Indian population due to various types of injuries. Conservative management is more effective if proper rehabilitation measures are taken. We evaluated rehabilitation management outcome after a long follow-up in 58 patients with age group of 15-60 years, who had peripheral nerve injuries in Kashmir valley. Brachial plexus injury was observed in 31 patients, radial nerve injury in 13 patients, 14 patients each had torture injury and post injection injury. Twenty-six patients had type-III injuries and 23 patients had type-I injuries of Seddon's criteria. All patients were advised exercises, splints, electrotherapy, sensory re-ducation and care of the skin along with ADL advise. Patients were followed up for 6 months to 3 years. After 3 years 28 patients recovered fully and 19 patients had partial recovery. In conclusion better rehabilitation management makes excellent outcome in type-I and type-II injuries without a need for surgical intervention.

Introduction

Nerve injuries are becoming more common because of increase in road traffic accidents, blast and fire arm injuries. Most of the injuries are closed traction type, usually of brachial plexus, due to torture. Other causes include fall, post surgical and post injection, post irradiation and knife cuts etc.

In the upper limb, brachial plexus or nerve injuries lead to sudden paralysis and loss of ADL. Nerve injuries of lower limbs lead to gait disturbances and hinder ambulation,.

Nerve injuries could be partial or complete. Severity of injuries varies from grade I to grade III (Seddon)

There are no proven procedures that will hasten nerve regeneration or accelerate the growth of regenerating axons along their sheath. Treatment is, therefore, directed to prevent complications which threaten the restoration of proper function after reinnervation.

Ultrasound and electrotherapy helps in maintaining muscles in functional status and prevent fibrosis and degeneration of nerve end plates.

The main aim of rehabilitative programmes is to keep the denervated muscles, joints, periarticular tissues and skin in optimal functional position and prevent complications, pending recovery and reinnervation[2]. After the reinnervation begins, remedial training procedures are started for integrated and well coordinated movements.

The peripheral nerve injuries have recently increased in the valley, mainly due to road traffic accidents, torture induced injuries, firearm and blast injuries. Hence the study was conducted on patients of nerve injuries who have been given a thorough trial of rehabilitative and therapeutic treatment and were followed from 6 months to 3 years.

Materials and Methods

This study was conducted between 1997-2000 in Physical Medicine and Rehabilitation department skims Srinagar . Patients with peripheral nerve injuries of all age groups and

either sex, whether operated or not, were studied. Birth injuries in neonates, post irradiation and malignant infiltration in neck, axilla or back and groin were excluded. A detailed history with thorough clinical examination and record of neurological examination ie. motor, sensory and autonomic deficit, were recorded.[3,4] Muscle power grading, sensory charts, self assessment charts and functional assessment were recorded.[5]

Investigations :- Radiography like X- ray chest, neck,shoulder,L.S spine and pelvis etc were done for bony fractures, dislocations, accesory bones, degenerative joint diseases etc which could have been the cause of nerve injuries. CT scanning or cervical myelography was done in few cases to confirm preganglionic from post ganglionic nerve injuries of brachial plexus. NCV was done to specify the site and extent of nerve injury. EMG was done to confirm the neurogenic type of EMG and rule out the muscle disease as a cause of weakness. Other routine investigation like haemogram and urine were done to look for systemic ailments which could hamper recovery of nerve injuries.

Criteria for classification of nerve injuries:

Seddon criteria was applied as follows :-

Type I- Neuropraxia : minor contusion of the nerve with preservation of axis cylinder. Temporary injury with complete recovery.

Type II: Axonotemesis axonal breakdown with intact endoneurium. Spontaneous recovery is expected.

Type III- Neurotemesis complete anatomic disruption with no recovery.

Management

Treatment was mainly aimed at emotional support, care of denervated muscles, peri-articular tissues, joints and insensitive skin. This was achieved by various rehabilitative and therapeutic procedures to keep the paralysed limb in optimal functional position, thus preventing development of contractures and deformity of joints.[15]

Care of Denervated Muscles :

These were protected against cold and heat exposures, minor trauma and overstretching by gravity. The muscles were kept in normal physiological length to prevent vascular and lymphatic stasis, contractures, joint stiffness and ankylosis. Procedures directed to achieve above goals were warmth, massage and movements, bandaging. TENS and electrotherapy, pneumotherapy, ultrasonic therapy, hydrotherapy and splints and other mechanical devices.

Splints and mechanical devices were used to give rest to the paralysed muscles and joints, preventing overstretching and shortening and thus avoiding contracture formation and deformity. These splints and other devices were detachable and dynamic to allow exercises and other therapeutic procedures to be given regularly and to prevent complications of continued immobilization.

Care of joints and periarticular tissues :

The insensitive joints and ligaments and other surrounding tissues were maintained in full functional position by daily and regular ROM exercises and dynamic detachable splints. These splints protected insensitive joint systems from external injuries.

Care of Skin :

Patients were asked not to handle hot and sharp objects and avoid use of hot water bottles, take care of nails and avoid exposure to cold and use of incorrect splints.

Sensory Reeducation

This was necessary to learn to interpret the altered profile of impulses reaching his/her conscious level after the injuried limb is stimulated by stimulating the finger tips by eraser edge of pencil from proximal to distal area in early phase and involved repetitive object identification to learn stereognosis in late phase of recovery.[5]

Results

58 patients ranging between the age of 15-60 years, with maximum number of patients in the age group of 30-45 years (28) were studied. One patient was lost to follow up after six months. Sex ratio was 4:1 (male/female).

The high incidence of nerve injuries in younger adults was because of road traffic accidents and torture.

Table.1 : Age & Sex Distribution

Age in years	*No. of Patients*	*Male*	*Female*
15-30	27	20	7
31-45	28	24	4
46-60	03	02	1
Total	58	46	12

Site of Nerve Injury

31 patients had brachial plexus injuries: 20 patients had complete brachial plexus with 6 patients having bilateral involvement; 5 patients had left side and 9 right side involvement. Upper brachial plexus was involved in 3 patients, lower brachial plexus in 8 and total brachial plexus involvement in 20 patients.

Radial nerve was injured in 13 patients, ulnar nerve in 3 patients and median nerve in one patient. Sciatic nerve injury was present in 10 patients.

Table-II: Distribution of Nerve Injures

Site of Injury	No of patients	R. Side	L. Side	Bilateral
Upper Brachial Plexus	03	02	01	-
Lower Brachial Plexus	08	02	06	-
Complete Br. Plexus	20	05	09	6
Radial Nerve	13	03	10	-
Ulnar Nerve	03	03	-	-
Median Nerve	01	01	-	-
Sciatic Nerve	10	04	06	-

Table-III: Nature of Trauma

Nature of Trauma	Brachial Plexus	Median Nerve	Radial Nerve	Ulnar Nerve	Sciatic Nerve	Total No.
Road Traffic Accident	10	-	-	2	-	12
Torture	10	1	3	-	-	14
Fall	06	-	-	-	-	06
Fire Arm Injury	02	-	02	-	02	06
Blast Injury	02	-	-	01	02	05
Post Injection			08		06	14
Post Surgical	01	-	-	-	-	01
Total	31	01	13	03	10	58

Nature of Trauma :

12 patients had road traffic accidents; 14 patients had torture induced injuries, usually of brachial plexus. 6 patients had fall from tree/ houses; 6 had blast and 5 patients fire arm injuries, 14 patients had post injection nerve injuries, especially of radial nerve. One patient was post surgical.

Table IV : Showing pretherapy categorization of patients with nerve injuries .

Type of nerve injury	No. of Patients
I	23
II	09
III	26

Neurodeficit :

All the patients had both motor and sensory deficit. These patients were divided into 4 groups according to motor power. Maximum no. of patients i.e. 26 had grade I power with sensory loss. 9 patients had grade 1-2 power with sensory loss and 5 patients with grade 2-3 power and sensory loss. Remaining 18 patients had grade 3-4 power with minimum sensory deficit.

Table V : Distribution of PTS, as per neurodeficit.

No. of Patients	Motor Deficit	Sensory Deficit
26	Grade 0-1	+
09	Grade 1-II	+
05	Grade II-III	+
18	Grade III-IV	±

Follow up :

These patients were followed up for six months to 3 years. Maximum number of patients were followed upto one year only as they recovered fully during this period. All the 58 patients were reviewed at one month, three months, six months, one year and three years. Patients with type-I injury (23) showed marked improvement within first six months. The intensive therapeutic and rehabilitative training programme and exercises enhanced recovery in these patients in all parameters i.e. sensory, motor and stereognostic. In first six months 21 patients recovered fully and were back to their job. Two patients showed recovery at the end of one year. None of these patients developed any complication of paralysis.

9 patients with type II injury showed signs of recovery at 3 months. 4 patients recovered fully at the end of 6 months and 3 patients showed signs of partial recovery at six months. 2 patients did not turn up for follow up. At the end of one year, 7 patients recovered completely and were back to their job without any complications. 1 patient had residual neurodeficit at one year and another was lost to follow up.

In type III injury (neurotemesis) out of 26 patients 6 patients showed minor

Table No. VI : Follow up

Type of Injury	*No. of Pts.*	*1 month*	*3 months*	*6 months*	*1 year*
Type-I	23	All pts. showed improvement in sensory & motor deficit	All pts. Showed further improvement in sensory & motor deficit & stereognositc function.	21 pts. Recovered completely 02 showed partial recovery	21 recovered completely and resumed their job 02 pts. recovered partially
Type-II	09	All pts. showed signs of improvement	6 pts. showed further improvement in sensory & motor deficit 3 pts. did not turn up for check up	4 pts. recovered completely. 3 pts. showed improvement only. 2 pts. did not turn up.	7 pts. recovered completely. 1 pts. showed partial recovery 1 pt. did not turn up.
Type-III showed no	26	17 pts. did not show any improvement. 6 pts. did not turn up. 3 pts. showed minor improvement	9 pts. showed of improvement 6 pts. Showed minor sensory improvement. 5 pts. did not turn up.	15 pts. showed no signs of improvement at all. 16 pts. Showed minor improvement in sensory and motor deficit 1 pt. did not turn up.	9 pts. no improvement at at all 16 pts. showed further improvement in motor & sensory deficit 1 pt. did not turn up.

improvement at 3 months, 15 patients did not show any improvement and 5 patients did not turn up. At the end of 6 months 16 patients showed minimum improvement in motor/ sensory deficit. 9 patients had no improvement at all in any parameter and 1 patient did not turn up for follow up. At the end of one year 16 patients did not show any further improvement and 10 patients had no improvement at all. At the end of 3 years 16 patients persisted with partial sensory and motor deficit but had no stereognostic function and 07 patients had no improvement in any parameter at all and few of them had minor complications i.e. pressure sore. 3 patients did not turn up for follow up.

Final Results

The final results of 58 patients at the end of 3 years showed that 28 patients recovered fully, 19 patients had partial recovery and 7 patients had no recovery. 4 patients were lost to follow up.

Table VII: Final Results.

Total no. of cases	Recover			Lost in followup
	Full	Partial	No	
58	28	19	07	04

Disscussion

The main aim of present study is to emphasize the need for various therapeutic and rehabilitation training programmes in peripheral nerve injuries of all types. 58 patients with various types of nerve injuries of both upper and lower limbs were studied. Type III nerve injuries with bad prognosis also need rehabilitation in early stages to prevent complications of joint stiffness, contractures and deformity. This is essential for their future reconstructive surgical procedures, amputations, orthodesis.[13,14] Even after surgery remedial retraining programmes are necessary for proper functioning of stumps and use of prosthesis.

In the present series young adult males between 30-45 years of age were in majority. They had traction type injuries, especially of brachial plexus, post injection palsies and road traffic accidents. The neurodeficit varied from G0 motor power in maximum no of patients (27) to GIII-IV in 18 patients A.O. Ransford et al (1977) in their 10 years follow up study of 20 cases, have also emphasized role of initial intensive rehabilitation. They concluded that surgical procedures should be delayed upto one year in all types of nerve injuries when no further recovery is possible. Amputation is attempted when the limb is flail and non-dominant, hindering ADL and preventing supports activities.

In 1944 Henery advocated extensive surgical repair in brachail plexus injuries followed by extensive rehabilitative programmes. Yomann and Seddon (1961) in their series of 36 patients concluded that amputation with arthodesis offered better results than either surgical or conservative treatment. Seddon (1979) had seen near total recovery in a boy with complete brachail plexus lesion of poor prognosis. Wyn Parry (1974) in a series of 23 patients with complete brachial plexus injuries, had 14 patients, with amputation and orthodesis within 6 months of their injury. 10 patients returned to their job within one year. Wyn Parry[16] (1981) described a patient with total brachial plexus injury whose sensory recognition recovered fully within 18 months after total denervation.

In our study of 58 patients, type I and II injuries (32) had better prognosis and maximum number of patients recovered fully by six months to one year. They had no complications of paralysis ie. Joint contractures, stiffness, deformity or anaesthetic sores and all these patients returned to their job within one year. The nature of trauma was torture, fall and road traffic accidents and in few cases injections palsies. These were usually avulsion type injuries with varying degrees of nerve trauma.

Out of 26 patients with type III injuries, only 6 patients had some recovery by the end of 6 months. However, at the end of one year 16 patients had partial recovery with minimum sensory deficit. Seven patients did not show any recovery at all. Their joint contractures and stiffness was managed by extensive rehabilitative procedures for maintaining them in near

normal physiological status, pending recovery or reconstructive procedures. These patients had mostly fire arm, blast injuries and severe road traffic accidents and in few cases injection palsies and with severe nerve damage. Seven patients with no recovery had nerve segment loss due to blasts and fire arm injuries and needed reconstructive procedures. Post injection nerve injuries, especially of radial nerve had type I and II injuries and recoverd fully. One case of sciatic nerve injury due to injection had presistent foot drop due to type III injury.

Conclusion

Peripheral nerve injuries of type I to type III need intensive rehabilitative training and therapeutic approach for their better management. Type I and type II injuries have excellent prognosis, without surgical intervention, if managed properly at an early stage. Various therapeutic modalities and exercises will lead to proper recovery without any complications like wasting, contractures, joint stiffness and anaesthetic sores. Sensory reeducation will lead to proper functioning of hand in Type III injuries, before surgical intervention, also need rehabilitation for keeping their muscles and periarticular tissues in near normal physiological status, Even after surgery such injuries need continuous supervision in rehabilitation department. In this study we have mostly come across with traction type of peripheral nerve injuries which recovered completely in all parameters by various rehabilitative procedures.

Hence it is emphasised that management of nerve injuries as a whole needs a team approach consisting of rehabilitation specialist, physiotherapist, occupational therapist, orthotist, and neuro-surgeon/orthopaedic surgeon.

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Osteoarthritis Knee Revisited

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Osteoarthritis, a degenerative disease of cartilage with secondary changes in the bone is the most commonly diagnosed condition affecting the knee joint. The special mention here is to the fact that it is not so commonly proved but is often blamed to be the cause of knee pain in adult population, especially in the elderly. Due to the fact that in early stages x-ray changes are not significant[1] and joint aspiration or arthroscopy is not indicated therefore patients are often put on presumptive treatment with NSAIDS regardless of the fact that the cause of the pain may not be arthritis. Because OA is present in older people and because older people complains of aches and pains an unfortunate tendency exists to blame OA for any ache or pain they have. However the pain in a patients with OA may be due to some other cause other than OA[2]. For instance, fibromyalgia has its greatest prevalence in individuals 50-75 years old, other diseases, which can begin at old age, are Rheumatoid arthritis and lupus. Leaving aside systemic conditions and focussing on a patient with a painful, obviously osteoarthritic joint, the following questions should be asked; (a) Are there soft tissue problems contributing to or explaining, the pain. (b) Does the pain have a remote origin (e.g., spinal disease causing deep pain or radicular pain? (c) Is a concurrent joint condition causing, or adding to, the symptoms e.g. a ruptured meniscus, bacterial infection, or crystal induced synovitis. (d) Mechanical factors leading to secondary stress on joint. In the knee joint two bones are required to be in better congruity taking the two menisci in between. Therefore the dynamic and static stability of the joint which is essentially maintained by joint capsules ligaments and muscles of the joint assumes the prime importance. Here the muscles play an important role in maintaining the dynamic stability of the joint. This leads us to the fact that any disturbances in the muscle torque production in between agonists and antagonists in concentric or eccentric modes are to be considered in the etiopathogenesis of knee pain with more emphasis. The patients are often diagnosed as osteoarthritis knee but they did not confirm to the ARA criteria for OA knees and no other cause of knee pain could be detected. Many of these patients take NSAIDS on regular basis with partial or temporary pain relief. These cases should be examined clinically and radiologically and isokinetic testing performed at two speeds-60 and 120 degrees. In most cases it is noticed that in all these patients there was either concentric or eccentric muscle weakness of hamstrings or quadriceps or both or there was imbalances in their muscle strength as measured by the isokinetic testing. Such patients respond to strengthening exercises based on specific torque deficiencies in the knee stabilizing muscles. Therefore keeping in view the above facts a specific knee pain protocol should be followed so as to omit an obviate the tendency for hitting with arrow in the dark.

Therefore in every knee pain we should first try to rule out all the differential diagnoses other than osteoarthris. The clinical laboratory and radiographic evaluation will help in ruling out most of the disorders. Table 1 refers to the American

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College Of Rheumatology criteria for classification and reporting of osteoarthritis of knee. Table 2 illustrates the other causes of anterior knee pain, which are to be looked for in a patient with knee pain. Investigations, which are very important, are hemogram with ESR, X-rays, Isokinetic assessment, and serum chemistry.

Here Isokinetic assessment of a patient with knee pain assumes its due importance, as it is a useful tool for assessment and quantification of exact muscle weakness and its response to exercise therapy. Unnecessary branding of osteoarthritis of a patient obviated and unnecessary long-term usage of NSAIDS avoided altogether. Procedures like joint fluid aspiration, arthroscopy and MRI are needed for very few patients in whom some specific diagnostic indication or therapeutic intervention is planned.

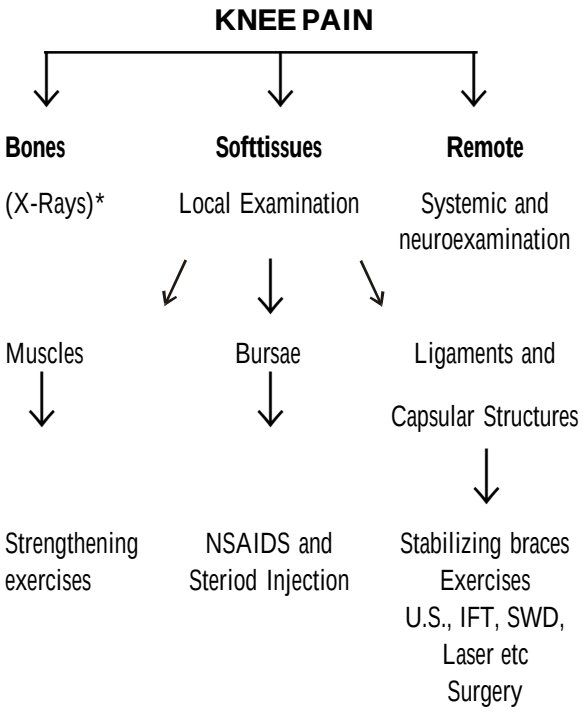
The knee pain management protocol in the alogrithm form is demonstrated in Table 1. It gives a rough guideline for the management of a patient with knee pain.

Treatment Protocol for knee pain and Osteoarthritis of knee

The primary goal of therapy are to relieve pain and maintain function. The initial approach to the patient should always include patient and family education regarding nature of disorder and prognosis.The mainstay of treatment rests on the motivation of the patient to undergo exercise regularly and to follow the suitable precautions as advised. Counseling the patient about the disease and the role of exercise needs to be emphasized. Isokinetic testing helps in documentation of amount of weakness and provides feedback for the patient if improvement is noticed. The exercises can be supervised with isokinetic dynamometer or home bound exercises can be given. After ruling out the easily treatable causes of knee pain if the patient is diagnosed as osteoarthritis then a more vigorous treatment protocol is followed.

After isokinetic assessment of the muscle torque loss the specific exercise regime as per the patient tolerances is prescribed. Abdominal and trunk muscle strength assessment and suitable exercises are also given. Weight line transmission if found faulty is corrected using knee supports and shoe wedges. Diet modification to reduce body weight assumes most important role so as to prevent the progression of the disease. Initial attempts at pain control should rely on use of safe therapies such as non narcotic analgesics (i.e acetaminophan), topical therapies (heat, cold, capsiacin cream). In patients showing no response low dose NSAIDS for pain reduction and control of inflammation in moderate doses.These are given along with gastroprotective agents. In patients who do not respond well to these conservative measures, other high dose NSAIDS and analgesic agents like propoxyphene, tramadol, or nightly tricyclic antidepressants may be given. Physical modalities like ultrasound, shortwave diathermy, microwave diathermy, interferential therapy and LASER therapy also helps in pain relief. Intraarticular steroids are given to provide pain relief and for control of inflammation. Use of anabolic steroids and antioxidant vitamins is controversial. Use of strong narcotics and oral corticosteroids should be discouraged. Intraarticular hyaluronidase[3,4] and gene therapies[5] are being tried. A variety of metalloproteinase inhibitors and chondroprotective agents are undergoing investigation in OA. Surgery is reserved for very painful deformed joints only.

Therefore from the above discussion it is implied that we should be more careful in diagnosing and treating a most common disorder like knee pain and osteoarthritis knee.



* X-Rays for evaluating bony pathology (See text)

Table 1

Alogrithm to show the various causes of knee pain and the management principles

X-Rays

X- Rays of the knee are in no way useful in diagnoses or prognosis of knee pain. The patient might have changes in joints but is asymptomatic, symptomatic patients with early OA may not have any X-ray findings suggestive of OA but on artthroscopy and bone scan may show cartilage degeneration. Prognostically also it has no role as its seen at times in presence of radiographic progression the pain may diminish owing to biologic splinting of joint by capsular fibres or restricting osteophytes.

Therefore X-Rays are useful only for exclusion of any other bony pathology.

Some frequently encountered questions are answered in the light of the available literature.

Role of Diet

Although exact association of diet with OA is not known but significant association of obesity and OA is observed. Reduction in weight reduces joint loading and hence reduces wear and tear of the cartilage.

Activity

Is activity good or bad? It is commonly encountered question faced by the physician.

Certain types of activities such as jogging and racquetball are to be discouraged. Excessive recreational activities that cause prolonged pain or joint effusion of more than two hours or additional symptoms the next day should be avoided and reduced to a tolerable level. Swimming is an excellent alternative to stay fit. Avoidance of prolonged, continuos activities in one position of the joint is the mainstay principle in prescribing activities. Adequate rest in between the activities is also stressed. Squatting and cross-legged sitting are to be avoided. Walking on plain surface for at least 3-5 km per day is a good exercise for strengthening as well as for building endurance .

NO ACTIVITY IS COUNTERPRODUCTIVE, RELATIVE REST IS THE KEY in acute phase also.

Counseling

Osteoarthritis is often not a visible illness so the patient either masks it or there is lack of understanding by others in family to the patient. This may lead to psychological stress to the patient and hence increase the problems of the patient. It is often useful to suggest to patient that the price they pay for covering up or keeping up is loss of potential support help and understanding. It may be pointed out that no matter how much others may care for the patient, they cannot read his mind. This may help the patient to decide when and where to cover up or keepup.

Another area that is less often explored is the effect of OA on sexuality and marital harmony. OA may significantly affect the sexual function and the cause may be pain, stiffness, and loss of libido. This can leads to marital unhappiness. The physician should try to initiate the discussion of sexual concerns, as the patient himself/herself may be reluctant to do so. This may often be accomplished as natural components of evaluation of daily activities task. The cause of sexual concern should be ascertained as well as what patient thinks and how the partner feels about it might improve the problem. In depth marital counseling is needed if such problems are detected.

Exercise in Osteoarthritis

Muscle strengthening exercises for quadriceps and hamstrings muscles are started in gradual manner. Initially isometeric muscle setting exercises which are of low intensity helps in promoting relaxation, increase circulation, decreases pain and spasm. Later resisted isometeric exercises at different angles are given to increase the muscle strength.These help in improving the stability during weight bearing and walking at various speeds. For advanced stage of rehabilitation isotonic exercises with the weights are started which are increased in intensity according to patient tolerance. The third type of exercises which assumes an important role in case of functional rehabilitation are isokinetic exercises which are carried out at the velocities consistent with the desired functional activity. Isokinetic exercises in higher velocity range produces maximal ,benefit with minimal joint compression. Apart from these specific exercises range of motion exercises and stretching of hamstrings and quadriceps is also important. Aerobic exercises like swimming and walking helps in maintaining the effect of exercises.

Patients with OA who are not relieved with analgesics, low dose NSAIDS, exercises thermotherapy , joint protection , footwear modification and compensation for altered biomechanics and use of cane and suffer from severe nocturnal pain should be referred for surgical evaluation.

Osteoarthritis and knee pain are the most common disorders encountered in general practice but are often casually addressed and managed. It is very important to understand the problem of the patient and to manage it in an effective and Holastic, manner. Attention to above mentioned facts can be helpful in complete management of the patients of knee pain.

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Post Carcinoma Breast - Lymphoedema Upper Limb - A Challenge

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Introduction

Living with a swollen limb is difficult, due to cosmetic effect, altered body image, altered ADL and psychosocial insults. Although lymphoedema, following Breast Carcinoma, (Surgery, Radiotherapy etc.) is a symptom and not a disease, and it does not threaten the general health of the rest of the body is not amenable to surgery, or medical treatment - has thrown a great challenge to the Physiatrists.

Lymph, is actually a tissue fluid, containing water and protein, clotting factors, which clots on standing invitro. It is carried by superficial and deep lymphatics - drains into thoracic duct and Right lymphatic duct and finally to venous blood. Oedema is nothing but accumulation of interstitial fluid in abnormally large volume. Thus lymphoedema may be defined as - Abnormally large accumulation of interstitial fluid in extremity or body part, when there is increase in girth more than 2 cms. It is initially soft then firm and finally hard with penu de orange skin, resulting from impaired function, damaged or blocked lymph channels. Usually it is prone to infection (High Protein Oedema). Patient feels a sense of heaviness or tightness, uncomfortable and a deep aching sensation. It may be primary or secondary.

Pathogenesis

Post Carcinoma breast lymphoedema following surgery, radiotherapy, chemotherapy, is of secondary variety-where there are following pathological changes :

1) Fenestration of Basement membrane.
2) Loss of vasomotion.
3) Failure of compensatory mechanism-proteolytic activity of macrophages and lymphatic collateral circulations are exhausted.
4) Inadequate transfer capacity.
5) Lymphatic load is more
6) Increased hydrostatic pressure, and protein content
7) Increased proliferation of Fibroblasts.
8) Fibrosis of regional lymph nodes and interlobular septa.
9) Increased subcutaneous fatty tissue.
10) Thickening of deep fascia.

Incidence

1. In Carcinoma breast following Mastectomy : 6-70% Heelan reported.
2. With Axillary node clearance :
   According to Washer et al
   a) Transient -7%
   b) Perisistent-12%
3. Mean time of development of persistent lymphoedema-14 months.
4. Post radiation-9.1%
5. Post chemotherapy alone -3.2%
6. Lymphangiosarcoma following lymphaedema -1%
7. Factors influencing higher incidence : Obesity, extensive axillary disease, metastasis to axillary nodes.

Staging

I. Reversible, Pitting (some may present with increased arm girth).
II. Irreversible, Brauny, Fibrotic, Nonpittng.
III. (Rare in Post CA Br.pts)-cartilagenous hardening with papillomatous out growth and hyperkeratosis of skin.

Measurements

There is no consistent definition of "Clinically significant lymphoedema" Common approach :

Circumferential measurements at 4 points - i) MCP jit; (ii) Wrist (iii) 10 cms distal & proximal

to lateral epicondyle. Difference greater than 2 cms - at any of the 4 points defined by some as "clinically significance"

Other methods

(i) Volumetric measurement by water displacement technique.

(ii) Lymphoscintography

(iii) CT Scan, MRI, USG etc.

(iv) Taking UL as a cylinder-circumference at the level of base of thumb and then every 4 cms. till anterior axillary fold. Then by mathematical calculation total volume of the limb is calculated (even segmental volume may be calculated) Vol. (V) $\sum_{n=1}^{n} \frac{cm^2}{\pi}$

(v) c=circumference, n=no. of measurement

Why it should be interfered? Because of (1) Functional disability in -UL-alteration of ADL; (2) Cosmetic reason; (3) Psychological set back. When to interfere?

If appears immediately and resolves spontaneously-no treatment is required.

If there is cellulitis-proper antibiotics to be given.

If appears years after or more-suspect recurrence.

If painless, gradual forearm/arm/swelling; increase in girth above 2 cms, as compared to healthy limb, appearing 6 wks. or more, after operation, chemotherapy or radiotherapy-requires therapeutic intervention.

Is it preventable? yes. Is it curable? No. is it controllable? Yes.

Prevention

a) Avoid-Obesity, Trauma, Injection, Infection, Heat-Sun, Sauna, Steam.

b) Operative Measures-Reduction of Post operative 'Dead Space' by making 'High axilla:

Preservation of axillary-Lymphatic trunk-surrounding axillary vein.

c) Post-Op. Measures-(for CA breast) -On 1st Post op. day positioning of limb should be-shoulder -90° abduction; Elbow-straight; Forearm-supported on pillow.

On 2nd post op. day-Ipsilat. hand-ADL training in simple form combing, brushing etc.

On 3rd post op. day-simple exs. to regain strength. mobility, flexibility e.g. shoulder exercises, breathing exercises; over head reach wall climb, clasp-reach-spread and simple occupational therapy.

d) Positioning + moments - Avoid prolonged standing with swollen upper limb hanging; while sitting-keep arm straight and well supported. While walking-move arms a little. If oedematous limb feels tired and achy-rest a little.

Treatment

A) Goal-To help the pt. to achieve desired level of function So aims should be : Mobilisation of fluid, Reduction of girth, Prevention of complication.

B) Components - Counselling-pts' education regarding his problems, prognosis etc. skin care, exercises, massage, compression.

C) Key to success -No single treatment but permutation and combination of different components of treatment & regularity in treatment.

Counselling : Know your own problem. Know its' remedies. Learn do's and don'ts. Avoid spicy food and alcohol. Avoid harsh detergents.

Skin Care

Do's

Use gloves during washing

Use thimble during sewing lanolin based hand cream may be applied.

use your own limb

Don'ts

No injection on same limb

No blood sampling.

No B.P. measurement

No ornament

No tight clothing.

No heat-three 'S' -Sun, Sauna, Steam Don't cut cuticles during manicure

Exercise : Regular exercise. No vigorous exercise. 'Sleeve on' during exercise. Limbs elevated during the exercise. Exercise to prevent Shoulder stiffness. Exercise for drainage of lymph from healthy limb.

Method : R.O.M. exercise. Isometric exercises. Isotonic exercises. Breathing exercises -active or intermittent compression of the thoracic cage.

N.B. : Do them slowly, Rhyhmically, Repeatedly.

Massage : No talcom powder during massage. manual decongestive massage-stroking with deep constant pressure. First proximal then distal segment.

Lymph drainage massage

Upper Limb - Neck glands, then glands under normal

Arm-chest/back-shoulder.

Then swollen arm first, forearm, then hand.

(Compartmental drainage system - Circular motion should be applied - Centripetal technique should be followed.)

Always followed by deep breathing exercises.

Caution - Echymosis, Firmness.

Compression may be achieved -

1. By Compression Garments - Sleeves/ stockings.
2. By Pneumatic Compression Pump-Single Channel or Multi Channel.
3. By Faradism under pressure.

Garments

Provides enough pressure (40-50 mm of Hg.)

Pressure more on distal end

Firm fitting and comfortable.

Wear constantly-when up and about

According to Collins et al mean decrease in volume in proximal part of limb is 9% and in distal part 26%

May be combined with-pneumatic compression pump and Faradism under pressure.

Pneumatic compression pump :

Not every patient needs it.

Produce intermittent compression.

Pressure < 60 mm of Hg.

Position : U.L. 120^{o} shoulder abduction and well supported/elevated.

Followed by massage and pressure garment.

Follows rule of compartmental drainage.

Arm-squeezed by sleeves.

Result-only with pneumatic compression pump-18% one study, no statistically significant reduction (another study).

Caution : Swelling around-shoulder/back/chest/ arm/infection : (contra-indication).

Faradism under pressure :

Low frequency direct current

Surging may be given.

Used as substitute of pneumatic compression pump.

Electrodes are placed under crepe bandage.

Position of limbs -as before.

Compartmental drainage.

Caution : Same as before

Result : With sleeves 17% improvement.

Hindrance to the treatment and their management :

Sensation of numbness in ipsilateral side, medial aspect only assurance to the patients.

Discomfort or pain on operated axilla and chest-analgesics/TENS may be given.

Hyperaesthesia-local desensitisation techniques may be applied.

Chronic radiation plexopathy-exercises and analgesics.

Phantom breast sensation -only assure and counsel the patient.

Post operative winging of scapula-exercises.

Adhesive capsulites/tendinites-exercises.

Scar adhesion-exercises.

Infection-antibiotics.

Depression-Psychiatric treatment will be required.

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Confusion To Clarity

Osteoporosis is an ailment taking shape of an epidemic on the medical horizons, consuming lot of research and brainstorming amongst experts, leaving lot of confusion among care-givers about most rational treatment of the condition. About 1.3 million fractures in USA and 0.2 million fractures in UK are attributed to osteoporosis, annually.

Osteoporosis may be defined as a reduction in bone mass per unit volume, such that fractures may occur with minimal trauma. In nutshell, everything is revolving around development of weakness and susceptibility to fractures among aging population, adding to other problems of morbidity in geriatric population, causing further complications and leading to death. Our aim is to diagnose it early, quantify the bone loss and susceptibility to fractures and prevent them, giving better quality of life to geriatric population. There are controversies and multitude of theories at every stage.

How to quantify osteoporosis? T-score of -1.0 to -2.5 is osteopenia and that below -2.5 is osteoporosis. T-score is calculated in relation to peak Bone Mass Density (BMD) of average population. Indian academics are arguing that, since our population has low peak BMD as compared to western (read White) and black population, we should set our own standards of average peak BMD and accordingly calculate T-score. Here is a catch. Susceptibility to fractures is a function of reduced BMD in absolute terms. Biomechanical factors remaining same, fracture susceptibility will relate itself directly to the BMD not differentiating Indian population. Most important is the fact that osteoporosis is preventable.

Other diseases and disorders including, cognitive, neurological, neuromuscular, etc. need to be taken care in the total scheme of management not underestimating the importance of proper environment like carpets, curbs, slippery floors, proper lighting, etc.

Various methods are available to quantify BMD. Days of subjective method of diagnosing osteoporosis on plain X-Ray are gone. Accurate diagnosis with quantification of BMD is essential. Ultrasound based and DEXA bone densitometry and Quantitative CT have established themselves and give similar results. Patient's financial capability to undertake these investigations should be accounted as the same pocket has to spend for treatment also.

One must always exclude diseases which are likely to confuse with osteoporosis. Generalized bone and bone marrow diseases having similar picture must be excluded. Fluorosis leads to apparent increase in bone density but not the strength.

Many methods of treatment are available from Hormone Replacement Therapy (HRT), Anabolic Steroids, Bis-phosphonates, Vitamin D, Alfa-calcidol, Calcium supplements, Calcitonin to ? Flourides (disputed), exercises, prevention of falls and so many other things. One has to choose from his learning from teachers and own experience, to learning from new literature. One must choose carefully from literature, not getting carried away by the claims of pharma industry.

We are at the stage of confusion but certainly the next stage is clarity. After every dark night there is a dawn.

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