GUILLAIN BARRE SYNDROME : NEW VENUES IN REHABILITATION

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INTRODUCTION

Guillain Barré Syndrome (GBS) is an acute and diffuse post infective disorder of the nervous system involving the spinal roots and peripheral nerves and occasionally the cranial nerves. The current view is that it is an inflammatory disorder due to disordered immunity perhaps as a result of variety of unidentified allergens, but the possibility still exists that some cases may be due to direct invasion of peripheral nerves by one or more viruses[1]. Recent studies focusing on the role of cytokines and its network of related mediators and receptors suggest that any imbalance may make a significant contribution to the outcome of the infectious disease process[2].

More often the patient is first seen in paralytic stage. The paralysis may affect all four limbs simultaneously. In contrast with other forms of polyneuropathy all the muscles of a limb are usually affected with superficial and deep reflexes a usually diminished or lost. Even in most favorable cases the patient is not likely to be convalescent in less than three to six months and in occasional cases the condition may smolder on for one to two years"[1]. In a study 42 patients with mean age 52 years, were evaluated at 2 weeks, 2 months, 6 months, 1 year and 2 years after GBS onset. At 2 years, motor impairment and sensory impairment were each still detectable in more than 50% of patients. The residual impairment was thus significant, somatically widespread and likely persistent"[3]. In another such study it was concluded that at Two years after GBS children have excellent long term recovery of peak muscle power. Muscle endurance measured by mean muscle power, was normal in the legs but was markedly low in arms. Thus it was suggested that pediatric rehabilitation program after GBS shall specifically target endurance of arms muscles[4]. Physiotherapy and allied techniques are the conventional methods used for the rehabilitation of patients with GBS. Cases of Guillain Barré Syndrome was received and management were done in the Pain & Hemiplegia Centre, Peshawar. We used acupuncture and Transcutaneous Electro Neuro Stimulators (TENS) to treat these cases. The cases are of paramount academic and clinical interest and we are reporting them as under.

CASE HISTORIES

Case No. 1

A child of 6 years of age was admitted in Paediatrics Unit at Khyber Teaching Hospital, Peshawar with complaints of numbness/ paresthesia lower limbs for 6 days, fever for 5 days, vomiting for 2 days, weakness of lower limbs and inability to hold head for 1 day while she had burning of micturition for the last 6 months.

Patient was discharged on November 03, 2001 and was called upon to visit ward every 2nd day for examination. On November 10, 2001, when she came for follow-up, she was oriented with normal speech but could not move legs. Her hyper aesthesia was two positive, power in lower limbs was 3/5, reflexes were not illicitable, had divergent squint in the right eye, respiration was normal and her blood pressure was 120/90 mmHg.

She had been prescribed with Tab. Prednisolone 1 tab TDS, Tab. Nifedipine 1/3 tab OD and Tab. Capoten 1 tab BD and she started to Improve.

In our centre, patient was brought by her grandmother on December 14, 2001 with the presenting symptom that she had her both legs flexed, had emaciated, her joints had gone more prominent due to atrophy of muscle mass. The child had already started to squat and pulls herself on floor. Thus she had not started adjusting herself with a harsh reality that she cannot, nor can she stand and walk on her legs anymore (a disabled child).

On Examination we found that her thigh and calf muscles were atrophied, her both knee joints markedly stiff and tender, both hip and knee joints were flexed. Child was anxious and highly resistant to any effort that would be done to extend hip and knee joint. Such a case had never come in

our 13 years of clinical practice. Thus it was a moment of new learning and great challenge for our clinical management. The first thing we did was to forbid the parents to allow child to squat and pull herself on floor as it would have caused postural abnormalities and skeletal deformities, as we did not know how long it might take towards recovery.

We had no guidelines where to begin. The patient would keep legs flexed and will not extend them, thus we started with treatment on poplitial fossa with acupuncture. Patient was so tense and anxious that she will hardly cooperate and would not extend the legs more than around 50 degree. We could hardly put in the requisite needles and give the stimulation. Added problem was that the child not understanding the treatment, would stiff her muscles again and then requiring continuous management, thus making the treatment more difficult.

Phase 1

There was no improvement at all in first three days. On 4th day, we decided to start treating on the principle that we treat osteoarthritis knee joint. We put in four acupuncture needles in and around each knee joint. Patient started responding favourable within 4 days.

The girl had started extending her knees. That was possibly to 90 degree and she was pain free around her knee joints. Still her knees were restrained from full extension to the level of healthy joint by strong and contracted muscles of the back of the thigh. This improvement gave encouragement to us as well the parents and we developed hope that child will recover.

More than two weeks had passed; we then introduced patients to TENS. We use a machine of the Chinese version (CBI Auto3). She was already tired of needling treatment and TENS was more acceptable to her. It not only gave her time to relax but also two weeks of TENS was rewarding and child's skin on thigh and calves started showing healthy color. Around 15 days of treatment with TENS was given.

There was another period of standstill and no appreciable improvement was being noticed. We did not know what to do next. The child was meanwhile continuously under management of Pediatrician to follow her BP and other symptoms of GBS. Pediatrician was also witnessing the milestones of recovery as was being achieved by treatment at Pain & Hemiplegia Centre. Patient was now pain free could extend legs to 120 degree.

After a phase of disarray and amid confusion, we decided to concentrate on those tendons that were keeping the knee joint in flexion and were not yielding. The two muscles that were restraining the knee from extension were Gracilis and Semitendinosus. This gave us the line of action and we tried two points, one placed on buttocks (Huantiao GB 30) corresponding to Sciatic nerve and other with approximation on motor point of Semitendinosus.

There was a breakthrough. Child started responding within days. There was more than 50% improvement. Child can now extend the legs to approximately 160 degree.

After this there was no further improvement but by now tendon of Gracilis and Semitendinosus had already yielded and were soft. Due to long illness, child had developed the habit of keeping her legs flexed, as this was the posture of maximum relaxation to both the hips and knee joints.

Phase 2

This gave us further idea that if we help child keep her legs extended most of the times, it would accelerate recovery. We prepared two crammer wire splints, bend were given to keep the legs at maximum possible extension without putting undue pressure on the joint and avoiding discomfort. Parents were properly briefed on the use of splint and they were advised to keep the splint tied to both legs for two hours and then release for two hours. Gradually time was increased to 4 hours. Meanwhile patient was being given treatment with TENS in the evening. Results were encouraging, splint helped child keep the legs extended.

Splinting and giving TENS treatment helped recovery in two ways.

i. Knees were now almost soft and could be extended to near normal extension.

ii. Tendons of Seimtendinosus and Gracilis though still standing prominent were no more stiff and hard but had gone soft to touch.

iii. Muscle mass of thigh and calves had started improving remarkably.

Phase 3

To make the treatment acceptable to the child and to revive her confidence she was given some exercises such as she could hold a chair would try to stand up and she could repeat this exercise for some time. Her power of limbs and back muscles had so much reduced that while standing up, she would not find it very easy and when she stood, her legs would starts shivering

and she would soon give up.

Taking this as weakness of muscles patient was given treatment with TENS to both legs. Within 10 days she started taking steps; finally we saw her walking with her back bent like a bow and knees mildly flexed. It was a moment of great achievement for all of us.

We asked her so many times that she shall point out any pain in any region so that we can treat that but she did not complain of pain. Finally we made her walk while she was asked to wear leggings and vest. We watched her, she was walking like an 80 years old weak emaciated aged lady who could not straighten her back and remained bowed. We watched her for sometime and all it revealed that her back muscles have also gone weak. She was then given TENS treatment to her back muscles. She dramatically straightened up within a week.

The child moved on her feet. She could stand on her legs, which a month back would have been a dream for her. She started going to school again after an absence of six months. Her parents think it is a miracle. This child who was on the verge of becoming a handicapped child was rescued to a normal living.

The child was discharged in good health on February 24, 2002. She was brought to our clinic for 2 months and 10 days. The days of actual treatment excluding Eid holidays and occasional absence come out to be approximately 8 weeks. Treatment was given for 45 minutes each day in outdoor. Other factors that might have contributed to recovery were the excellent affection and care; the grandmother gave to this child. She gave her daily massage with olive oil and would give her warm water baths.

Case No. 2

A young female in her teen age was brought in our clinic in a state of Quadruplegia. She was bed ridden for the last one and a half month. Inhabitant of Khust (Afghanistan) she was diagnosed by consultants as a case of GBS. She had complete flaccid paralysis of all four limbs. Her back muscles were weak. She could not sit in bed or chair. Even she could not hold her head. She had a very weak voice and could ingest /engulf only fluids.

Treatment was begun with acupuncture to all the four limbs. Daily treatment was given to Para vertebral muscles from dorsal spine to lumbosacral spine and to all the four limbs. She started showing signs of improvement within days and listlessness of the limb muscles gradually started improving. For her neck Muscles and throat a couple of point related to these areas were treated with acupuncture. Electro stimulation was given to all the points in these treatments. Within a week she showed positive signs of recovery and soon fingers and arms and feet and legs could exhibit mild movements indicating signs of life again. She took about two weeks before she could sit in the chair /bed with support and could hold her head. She could now engulf food completely. Within a month she could now take a step with help of two attendants.

At this stage she was home sick and was discharged to come back for treatment within two weeks. She reported back and had shown remarkable improvement in these days. After reassessment we decided to put her on Trans-cutaneous electro-neuro stimulators on the limbs and on the Para vertebral muscles. With three weeks of treatment on TENS she had marked and rapid improvement and was discharged in good health and spirits.

DISCUSSION

IgG anti-GalNAc-GD1 an antibody isolated from serum of patient of Guillain-Barre syndrome and later was produced experimentally by immunization of a rabbit with GalNAc-GD1a, blocked neuromuscular transmission in muscle-spinal cord co-culture cells. The acetylcholine induced potential did not reduce by adding these sera, suggesting that the blockade was presynaptic. This antibody may block neuromuscular transmission by attacking on presynaptic motor axon, probably affecting the ion channels in the presynaptic motor axon[5]. In a study on Immune-mediated segmental demyelination, the basic pathomorphological substrate of the Guillain-Barre syndrome (GBS) it was reported that the maximal reduction of the amplitude of the CMAP (maximal Conduction Block CB) was registered before the 30th day from the onset of the disease with following recovery on the sixth month and first year. When patients reached a clinical plateau, progressive slowing of motor nerve conduction and increasing CB were registered[6]. Plasma exchange (PE) is the first-line treatment, improving outcome in several randomized, controlled clinical trials. High-dose intravenous immunoglobulins (0.4 g/kg daily for 5 days) and PE are equally effective in patients with intermediate and severe forms of the disease[7]. Physiotherapy the conventional method to treat these disorders remain ineffective in relieving the CB and paresis of GBS.

Acupuncture is the therapeutic technique that is so widespread in China Japan Korea and other Countries of the Far East. It is widely making its place in the western world in the field of pain management and rehabilitation of Patients

in paresis. Acupuncture exerts its effects by three mechanisms:

i. Increasing the endorphin and encephalin secretions in the body,

ii. Gateway control mechanisms,

iii. Relieving the state of muscular spasm through causing passive contraction, by stimulation of motor points of groups of muscles.

The first case of GBS was complicated by joint stiffness and wasting of muscles. In the first phase of treatment, all the three mechanisms contributed towards pain relief of the knee joints. To relieve the stiffness of muscles of the back of the thigh (gracilis and semitendinosus) third mechanism was made use of. In our clinical practice Acupuncture is known to be the best therapeutic technique to reflect peripherally any development that has occurred in the higher centers in rehabilitation of stroke cases. Thus these results indicate role of Acupuncture in relieving pain, CB and paresis of GBS, opening new venues for the treatment and rapid recovery of symptoms in this condition. It seems to have an effect of opening the conduction in the blocked neuromuscular transmission when stimulated with electro acupuncture from the periphery. Same results were achieved and are reported in a clinical case study[8]. Patients with GBS experience excessive fatigue that may persist for years and reduce quality of life. This is due to the weakness of the muscles. In one study 12-week bicycle exercise training was given to 20 patients with severe fatigue. Training seemed well tolerated. Physical fitness, functional outcome, and quality of life of these patients were improved[9]. We use TENS for the same treatment and achieved better results in relatively short period of time. The recovery of motor power was 80%.

TENS are modern machines developed on the principle of acupuncture. Used appropriately they put muscles in passive contraction. This treatment puts the group of muscles on moderate exercise. Done for couple of days they increase muscle mass, increase the stamina of the muscles, improve their tone and force of contraction. One typical example of their use is Quadriceps drill, which we use in our practice to treat osteoarthritic knee joint and cases of hemiplegia.

CONCLUSION

Our case series show that acupuncture was an effective form of treatment for these cases of GBS and it is suggested to carry out a study with more number of patients to confirm these results.

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