

ROLE OF ACULASER THERAPY IN CEREBRAL PALSY CHILDREN. (INITIAL DATA & RESULTS)

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Abstract:

A single, open and non comparative study was conducted at Anwar Shah's First C.P. & Paralysis Clinic and Research Center to evaluate the effects of AcuLaser therapy in children suffering from Cerebral Palsy (CP) of various types. In all 15 children were treated and the initial data was gathered during a period of 6 months from October 2003 till March 2004. These children were included randomly as they presented at the center. This article shows the initial results of the treatment with AcuLaser therapy in CP children who had minimum of 10 treatment sessions or more. Follow up study will be presented later. These children were further classified according to their major presenting complaints. Analysis of the data showed that out of 11 children with severe spasticity and stiffness all showed marked improvement showing 100% success rate, out of 8 children with Epileptic fits there was a significant reduction in the intensity, frequency and duration of Epileptic fits in 6 children while 2 didn't show any improvement or aggravation showing 75% success rate. Out of 5 children with cortical blindness 2 children showed complete recovery of vision and 3 showed marked improvement, accounting for 40% cure rate; out of 4 children with hearing difficulties, 2 showed marked improvement accounting for 50% success rate; out of 14 children with speech disorders 8 showed improvement reflecting 57 % improvement rate.

Analysis of the data gathered during this study indicates a high %age of improvement in C.P. children, not only improving the spasticity and stiffness but also the cortical blindness, epilepsy, deafness and speech.

Key Words:

Cerebral Palsy, AcuLaser therapy, Laser acupuncture, CP Children, Cortical blindness, Epilepsy, Spasticity, Sensory neural deafness, Speech disorders.

Background:

The incidence of CP is 7 per 1000 live births {Nelson. Essentials of Pediatrics 1998 (1)}. Because cerebral palsy influences the way children develop, it is known as a developmental disability. Today, more people have cerebral palsy than any other developmental disability, including Down syndrome, epilepsy, and autism. In general there is not any single treatment which addresses physical, mental and cognitive aspects of CP children. This research study is based on the principal of combining and using different treatment modalities like laser acupuncture (LLLT), auriculotherapy, physiotherapy, magneto therapy, colour therapy and reflex massage for the treatment of children suffering from CP.

Objectives:

The main aim of this study is to develop a treatment plan for the CP children. This treatment plan should not only address the physical aspect but also the mental and cognitive aspects. AcuLaser can be modified according to the requirement of every different case and improves all aspects of CP children, namely physical, mental, psychological and cognitive.

Introduction:

Acupuncture is one of the oldest treatment modalities, which have been successfully practiced in China for the last 4000 years {Lewith (2)}. Traditionally acupuncture has been used for various mental and physical disabilities. Especially in the last 35 years with the development of different forms of scalp acupuncture by Dr. Jiao Shunfa {Jiao Shunfa 1997 (3)}, Zhu's Scalp Acupuncture {Zhu Mingqing 1992 (4)} and YNSA {Yamatomo's New Scalp Acupuncture 1998 (5)} use of acupuncture in neurological and developmental disorders has increased to a greater extent. World Health Organization reviewed and standardized Scalp acupuncture in 1984. In 1988 WHO published the first standard pamphlet on Scalp acupuncture {WHO 1991 (6)}. Many studies done all over the world on humans and animals show that Scalp acupuncture is very effective in treating developmental and neurological diseases in children and adults. Research shows that level of certain hormones in the body and cerebral blood flow improves {Hazelwood, ME et al 1994 (1)}, {Xiang L (7)}.

Low Level Laser Therapy (LLLT) is the use of low power therapeutic lasers to treat various diseases. Many research studies show that LLLT has various effects on cells and nervous tissue {Tunér 2002 (8)}. LLLT is used to stimulate wound healing and tissue regeneration {J. Pineal Res. 2003 (9)}. Some studies demonstrate that LLLT can be used safely on acupuncture points and different zones or areas on scalp {Lazoura (10)}.

Physiotherapy is widely used as an integral part of the treatment for C.P. all over the world. Hundreds of studies show that physiotherapy helps to a major extent in the treatment of C.P. {Parkes, 2000 (11)}.

Magneto therapy is the use of magnets or magnetic fields to treat various diseases. Recent studies show a positive effect of magnet therapy in various neurological and developmental diseases like epilepsy {Seizure. 2003 (12)}.

Colour therapy is based on the fact that physiologic functions respond to specific colors. Using coloured light for therapy has been in practice a very long time and we see it happening every day, whether we realize it or not. Research was also done to test the effects of coloured light on muscles. When subjects were using a hand grip and exposed to blue light, their grip lightened, while other tests have shown that when muscles were exposed to red light the electrical activity in them increased {M Donnelly 2000 (13)}. In conventional medical practice, the use of blue light in the treatment of hyperbilirubinemia has been proven by many researchers including Vreman et al with their study "Light-emitting diodes: a novel light source for phototherapy". {Creamer and McGregor of St John's Institute of Dermatology, London}

Reflex massage or Reflexology has been practiced for thousand years. Reflex massage helps in physical and mental relaxation. Some studies show that Reflex massage improves nerve and blood supply {Dwight C. Byers 1997(14)}.

Auriculotherapy is a health care procedure in which the auricle is stimulated with a TENS (Transcutaneous Electrical Nerve Stimulation) to diagnose and treat different diseases. While originally based upon the ancient Chinese practices of acupuncture, the somatotopic correspondence of specific parts of the body to specific parts of the ear was first developed in France. Recent studies show an increase in cerebral blood flow after stimulation of the corresponding auricular points {Alimi D 2000 (15)}.

Methods and Materials Used:

This pilot study was conducted at Anwar Shah's First CP & Paralysis Clinic and Research Centre for a period of 6 months from October 2003 till March 2004.

In all 15 C.P. children with different types and aetiology were treated. There were 10 boys and 5 girls. Their ages were from 1 year to 5 years. Their mean age was 2.4 years.

The history of every child was taken and a primary clinical assessment was done. CT scan and MRI were conducted to rule out surgical lesions in some cases. After primary

assessment, the children were treated with AcuLaser therapy. In this study we used LLLT, Acupuncture (body points, scalp areas and auricular points) and Physiotherapy as main treatment modalities. This study was conducted in very young children who normally have thin hair and skin. And if a few children who had thick hair; their parents were asked to shave their heads regularly so we could stimulate different scalp areas properly. We did not follow any single method or school of acupuncture. We actually combined different methods like 5 element acupuncture, scalp acupuncture (Jiao Shunfa, YNSA & Dr Zhu) and auricular acupuncture to treat so many different cases of CP & associated neurological disorders.

In acupuncture treatment there is no specific formula or set of points to treat any case and treatment may vary for the same patient on subsequent sessions depending on the response. However, there are some generalisations which could be applied like for spasticity Liver 3 & Gall Bladder 34, for irritability and restlessness Heart 7, 5 (for speech as well), Du 20, to increase cerebral blood flow Du 26, 14, 16, etc. On scalp we used motor areas, speech area, brain point etc. On auricles we stimulated subcortex, shenmann, back, limbs etc.

We used two types of soft lasers with different wavelengths. For scalp we used red diode laser with a wavelength of 650 nm, 5 mW, manufactured by Wen Zhou Electric Appliance Company, Xinke province, China. For body and auricular point stimulation we used HJZ3A HeNe laser with a wavelength of 632.8 nm, 30 mW from tube, and estimated power at fibre tip 20 mW. This laser is manufactured by Guoguang Electric Co Ltd of Chengdu, China. Each body and auricular point was stimulated for 15 seconds (0.3 J) while scalp areas were stimulated for 30 – 45 seconds (0.15-0-23 J). We used laser in contact with the skin. The body acupoints are small areas of maximum 1 cm diameter. Scalp areas or zones are bigger areas and may vary in size from 1 cm to 3 cm.

In addition to the LLLT every child had a full session of physiotherapy. Their progress report was recorded on every visit to the centre and physical measurements were done at 6 weeks interval. Photographs of each child with physical dysfunction were taken before, during and after treatment. These children were advised to come twice a week. In addition to the treatment at the centre their parents were taught the reflex massage which they performed twice daily at home.

ACULASER THERAPY:

AcuLaser therapy is a combination of the following treatment modalities:

- Laser Acupuncture (LLLT).
- Auriculo Acupuncture.
- Physiotherapy.
- Magnetotherapy.
- Reflex Massage.
- Color therapy.
- Speech therapy.
- Energy therapy or Reiki.

- Vitamins & Nutritional advice.

All or some of these are used in different patients according to the requirement. Patients are advised to visit the centre twice a week initially and then once a week.

According to a survey conducted in 1986, 2.6 % of the population of Pakistan is disabled (including both physical and mental disabilities). Children between 0-14 constitute 40% of the disabled population in Pakistan. Routine medical treatment including physiotherapy, sensory therapy, medicine and rehabilitation therapy does not offer much hope to this very big percentage of the population.

This study proves that AcuLaser therapy can greatly improve the physical function and mental capabilities of the C.P. children thus improving the quality of life of these children.

Results:

Initial status, initial measurements, progress report and present measurements of all the children who were treated with AcuLaser therapy at Anwar Shah's First CP & Paralysis Clinic and Research Center.

No.	Name & Date of 1 st visit.	Age/Sex	Presenting Complaints	Initial Meas.	Present Status	Present Date & Meas.
1	Zaynebiha 01/ 10/2003	2yrs/ F	Cerebral Palsy. Epileptic Fits. Cortical blindness. Cannot hold neck. Recurrent UTIs & high grade fever. Deafness. Severe Constipation Excessive crying. Can't speak at all.	Crown: 43cm Wt. 8Kg Ht. 76cm	Holds her neck. Vision restored. No more fever & UTIs. Tries to sit. Bowls regular More active Epileptic fits improved. Makes sounds to attract mother. Hearing improved.	23/03/04 Crown 46cm Wt. 10.5 Kg Ht. 83m
2	Faizan Zahoor 04/10/2003	3yrs/ M	Cerebral Palsy. Cerebral dystrophy. Deafness Can't hold neck. Spasticity of whole body. Recurrent persistent vomiting. Constipation. Epileptic fits.	Crown: 38cm Wt. 7Kg Ht. 78Cm	Holds his neck & sits with support. Vomiting Improved Hearing improved. No more spasticity. Bowls regular. No more epileptic fits. Social smile.	23/03/04 Crown 40cm Wt. 9 Kg Ht.

			Spasticity.		More responsive.	83 cm
3	Muhammad Abdullah 05/10/2003	1.5y/ M	Cerebral Palsy. Can't hold neck. Spasticity. Sleeps disturbed Constipation. Irritable. Epileptic fits. Dribbling of saliva. Deafness	Crown: 41cm Wt. 7Kg Ht. 75Cm	Holds his neck & sits with support. Spasticity reduced. Holds small objects. Sleep improved. Epileptic fits not improved. No more dribbling of saliva. Hearing improved.	23/03/04 Crown 43cm Wt. 10Kg Ht. 82cm
4	Qadeer Zafar 05/ 10/2003	5yrs/ M	Cerebral Palsy. Epileptic Fits. Spasticity. Can't hold neck. Can't eat semisolid, vomits. Disturbed sleep. Looks like a 2 year old child.	Crown: 37.5cm Wt. 7.5Kg Ht. 79Cm	Holds neck & sits with support. Spasticity markedly improved. Started to semisolid foods. Vomiting almost gone. More active. No change in fits.	23/03/04 Crown 39cm Wt. 9Kg Ht. 82 cm
5	Aqsa 17/ 10/2003	2yrs/ F	Cerebral Palsy. Delayed milestones Cannot hold neck. Repeated infections & fever. Irritable. No eye contact & social smile.	Crown: 40cm Wt. 6Kg Ht. 72Cm	Holds neck. Can sit & stand with support. No more fever & infections. Eye contact & social smile.	23/03/04 Crown 42cm Wt. 8Kg Ht. 76.5 cm
6	Najeeb ud Din 18/ 10/2003	1yr/ M	Cerebral Palsy. Hydrocephalus, he was operated & shunt placed. Can't hold neck. No eye contact & social smile. Spasticity. Epileptic fits.	Crown: 39cm Wt. 6.2Kg Ht. 82Cm	More responsive, social smile, eye contact, recognizes mother & family. Spasticity improved Asks for food. Started taking semi solid diet. Epileptic fits reduced.	11/03/04 Crown: 41cm Wt. 8.5Kg Ht. 85 cm
7	Maryam Irfan 23/ 10/2003	2yrs/ F	Cerebral Palsy. Cortical blindness. Nystagmus. Spasticity. Repeated infections & fever.	Crown: 43cm Wt. 8.4Kg	Nystagmus gone. Vision improved. Speaks few words. Light response. Now she can get up & sits by herself.	23/03/04 Crown 45cm Wt.

			Incoherent sounds. Operated for hydrocephalus.	Ht. 84Cm	Infections & fever reduced.	9.5Kg Ht. 89cm
8	Abu Hurairah 18/ 10/2003	2.5y/ M	Cerebral Palsy. Epileptic Fits. Cortical blindness. Spasticity & Deafness. Can't sit. Right arm & right leg semifixed & very stiff.	Crown: 42cm Wt. 8Kg Ht. 81Cm	Vision restored now can see. Eye contact & social smile. Stiffness & weakness improved Now can sit. Stands with support. Hearing improved.	26/03/04 Crown 44.5 cm Wt. 10.4 Kg Ht. 85cm
9	Muhammad Huzefa 29/ 10/2003	2.5y/ M	Cerebral Palsy. Cortical blindness (only pupils respond to light). Stiffness of whole body. Can sit for a few seconds.	Crown: 44cm Wt. 10Kg Ht. 86Cm	Vision improved sees colorful objects close to the eyes. Now sits for 3-4 min. Stiffness reduced.	30/02/04 Crown 47cm Wt. 13Kg Ht. 91cm
10	Maimoonah Ahmed 13/12/2003	2.5y/ F	Cerebral Palsy. Weakness & spasticity of both legs & right arm. Speaks 1 word. Squint & very weak eye sight. Repeated infections & fever. Dribbling of saliva. Can't sit.	Crown: 45cm Wt. 9.5Kg Ht. 90Cm	Squint markedly improved. Speaks more words & sentences. Can sit with support. Infections & fever improved. Dribbling of saliva improved.	11/03/04 Crown 46.5 cm Wt. 11Kg Ht. 93cm
11	Abdul Rehman 29/12/2004	2.5y/ M	Cerebral Palsy. Cortical blindness. Hydrocephalus. He was operated 7& shunt placed. Cannot hold neck. Does make any noise & doesn't cry. Constipation. Stiffness.	Crown: 52cm Wt. 6.8Kg Ht. 76Cm	Vision improved. Responds to light. Holds his neck. Bowls regular. Makes noise & cries when hungry. Stiffness improved.	27/03/04 Crown 52cm Wt. 8Kg Ht. 79cm
12	Muhammad Uzair	2.4y/ M	Cerebral Palsy. Cannot hold his	Crown: 39cm	Holds his neck. Tries sit for few	24/03/04

	24/01/2004		neck. Flaccidity. Cannot sit at all. Dribbling of saliva. Severe constipation.	Wt. 9Kg Ht. 85Cm	seconds. Bowls regular. Flaccidity improved. More responsive.	Crown 40cm Wt. 9.8Kg Ht. 87cm
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13	Nayab Sakeena 17/ 10/2003	4.6y/ F	Cerebral Palsy. Epileptic Fits. Spasticity of whole body. Excessive saliva. Can sit for 2-3 min. but can't stand or walk. Recurrent chest infections & fever. Weakness of right half of the body.	Crown: 45 cm Wt. 14.5Kg Ht. 114Cm	She can walk with support, climbs up the stairs by holding the railing. No salivary secretions. She speaks few words and combines 2 words. Sleep pattern has improved. Spasticity almost gone. Decreased epileptic fits.	24/03/04 Crown: 47m Wt. 17Kg Ht. 120Cm
14	Saad Ahmed 12/02/2004	9.5 months	Blue baby at birth, delayed cry. Cerebral Palsy Epileptic fits. Delayed mile stones, can't hold neck. Weakness of right half of the body. Recurrent infections & high grade fever.	Crown: 41cm Wt. 8Kg Ht. 72Cm	Holds his neck & sits with support. Decreased epileptic fits. Holds small objects & plays with toys. No more fever & recurrent infections. More active & responsive.	28/03/04 Crown: 42m Wt. 9Kg Ht. 74m
15	Rafe Malik 20/02/2004	2.2 yrs.	Cerebral Palsy. Delayed milestones Cannot hold neck. Repeated infections & fever. Recurrent vomiting Gastotomy was done 8 months back	Crown: 42cm Wt. 8Kg Ht. 82Cm	Neck holding is better. Vomiting has improved no episode for last 1 month. More playful and responsive. Appetite improved.	27/03/04 Crown: 43cm Wt. 9Kg Ht.

			Asthma. MRI shows diffuse marrow dystrophy. Irritable. Severe spasticity of legs.		Spasticity of legs decreased.	84Cm
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Total number of CP children: 15.

Children with Cortical blindness: 5
 Children with Epilepsy: 8
 Children with Spasticity & Stiffness: 11
 Children with Hearing difficulties: 4
 Children with Speech Disorder: 14

Male: female sex ratio:

Baby boys: 10
 Baby girls: 5

Age distribution:

Age	No. of children
Less than 1 yr.	01
1 to 2 yrs.	05
2 to 3 yrs.	07
3 yrs or above.	02

Response of C.P Children to ACULASER Therapy with Different Diseases:

1. Response of C.P Children with Epilepsy:

Out of 8 C.P. children with epilepsy 6 showed marked improvements as both the frequency and intensity of epileptic fits decreased. This accounts for 75% success rate.

2. Response of C.P Children with Spasticity & Stiffness:

Out of 11 C.P. children with epilepsy all showed marked improvements as both stiffness and spasticity improved. This accounts for 100% success rate.

3. Response of C.P Children with Cortical Blindness:

Out of 5 C.P. children with cortical blindness vision of 2 children was restored completely showing 40% cure rate.

4. Response of C.P Children with Hearing Difficulties:

Out of 4 C.P. children with epilepsy 2 showed complete recovery. This accounts for 50% cure rate.

5. Response of C.P Children with Speech Disorder:

Out of 15 C.P. children with speech disorder 8 children improved showing 57 % improvement rate.

Complications of AcuLaser Therapy:

Generally we did not experience any adverse effects of AcuLaser Therapy like aggravation of epileptic as mentioned in one study {Fadaie 2002 (16)}. AcuLaser Therapy, if performed properly by qualified and properly trained Doctors does not produce any adverse effects. However, few minor temporary complications occurred in C.P. children getting AcuLaser Therapy. These temporary complications are:

1. Hyperactivity and Restlessness:

Few of the children initially showed hyperactivity and restlessness. This hyperactivity is most probably due to increased cerebral blood flow.

2. Disturbed Sleep:

Some children who were under AcuLaser Therapy in the late evening and night showed disturbance of sleep. This improved when these children were treated during day time.

3. Irritability:

Some children became irritable after the treatment initially. This is perhaps they were not familiar with the Doctors and the staff but later on they settled.

Discussion:

Cerebral palsy (CP) is a term used to describe a group of disorders effecting body movement and muscle co-ordination. The medical definition of CP is "a non-progressive but not unchanging disorder of movement and/or posture, due to an insult or anomaly of the developing brain." Development of the brain starts in early pregnancy and continues until about age three years. Damage to the brain during this time may result in CP. This damage interferes with messages from the brain to the body, and from the body to the brain. Incidence of CP is increasing world wide. Orthodox treatment modalities do not offer much improvement especially in mental faculties of the CP children.

Studies conducted in different parts of the world involving unconventional treatment modalities like Acupuncture, Acupressure, Laser Acupuncture and Scalp Acupuncture show a very good success rate for the treatment of CP and other Neurological disorders { Jiao Shunfa 1997 (3), Liang 1984 (17), Fila 1997 (18), Fadaie 2002 (16)}.

AcuLaser therapy is a combination of the following treatment modalities: Laser Acupuncture (LLLT), Auriculo Acupuncture, Physiotherapy, Magnetotherapy, Reflex Massage, Colour therapy, Speech therapy, Energy therapy or Reiki, Vitamins & Nutritional advice. All of these treatments are commonly used for the treatment of CP. When we combine these, the rate of recovery improves a lot. We've observed that CP children who are getting AcuLaser Therapy not only show quick physical recovery but they also show rapid improvement in mental and cognitive faculties.

In our study, AcuLaser Therapy was safe, effective, painless and aseptic; it gave rapid results in most cases. Most children complied easily with the treatment. Changes were observable almost in the first 2 -3 weeks of therapy. AcuLaser Therapy may be a good adjuvant therapy to help CP children to reduce the degree of their disabilities and improving the quality of their lives. Proper selection of the cases and conduction of the treatment at the proper time should optimise the success rate. The best results were in children <2 years of age and the second best group were <5 years of age which signifies that AcuLaser therapy when instituted earlier gives better results.

Conclusion & Recommendations:

This study concludes that AcuLaser Therapy is effective for the treatment of CP and associated disorders like cortical blindness, spasticity, deafness, epilepsy, and speech disorders. AcuLaser Therapy not only addresses and improves the physical aspect in CP children but also the mental and cognitive aspects.

CP children with various associated disorders like epilepsy, cortical blindness, spasticity, deafness and speech disorders show quick and significant improvement.

The ideal time for this treatment is before 1 year when brain's growth is at maximum (weight of the brain of a new born baby is 250 grams and it grows to 1000 grams at 1 year and then till the age of 7 years it reaches around 1300 – 1400 grams maximum).

Children who are between 1- 3 years old also show good response. Response is not very good in children who are older than 5 years as size of the brain does not increase after this age.

We strongly recommend that further larger controlled studies should be conducted and the AcuLaser Therapy should be adopted as a treatment option for CP along with other modalities.

We know that that weight of the brain of a new born baby is 250 grams and it is 1000 grams at 1 year and then till the age of 7 years it reaches around 1300 – 1400 grams maximum. This shows that a child who presents before the age of 1 year has the maximum potential for improvement as brain cells and neurons are growing and multiplying rapidly.

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