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Cerebral Palsy and Ayurveda

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Abstract: *Cerebral palsy a most common chronic disease of mental and physical disability among children is increasing progressively and affect 3-8% population which fails to respond the present technologies or medication of modern medicine while a combination of herbal composite constituting herbs of proven efficacy for neuro viability, neurovigorative, and neurotonic effect, shows marked therapeutic response in all the cases of < 2 years of age while others > 2 years age and with spasticity had transient relief of presentation without affecting mental capability.*

Early detected cases had marked improvement of physical, mental and, IQ status restricting spasticity and provide better quality of life.

Keywords: *Cerebral palsy, spasticity, IQ, and mental status, Quality of life*

1. INTRODUCTION

Cerebral Palsy (CP) is a most common chronic motor disorders in children with considerable morbidity and affect about 3-8% of the population with 15-20% of physically disabled children and incidence of 3/1000.(WHO) [1,2,3,4]

Cerebral palsy affects 2.1 per thousand live birth more among poor and male and prevalence average rate is of 2 per thousand most commonly in low birth weight babies. Cerebral palsy incidence increases with premature and low birth weight babies regardless of quality of care

Cerebral palsy on the basis of part affected being classified as - Monoplegia, Hemiplegia, Diplegia and quadriplegia out of which diplegia is the commonest (30-40%), Hemiplegia (20-30%), quadriplegia (10-15%), Spastic quadriplegia 61% and diplegia 22% [5,6,7,8]

Spastic Cerebral Palsy is the commonest and accounts to 70-75%, dystonic 10-15% and ataxic <5%. Cerebral palsy is not a progressive disorder but manifestations become more prevalent over time and are more likely to have learning disability without affecting IQ including varying degree of intellectual disability with significantly reduced life expectancy depending on severity of condition & quality of care. [9,10,11,12]

5-10 % of children with Cerebral Palsy die in childhood particularly who had seizure and intellectual disability.

The ability to ambulate, roll and self feed are the index of increasing life expectancy, in addition independent gross motor functional ability is a very strong determinants of life expectancy .[13,14]

The most accurate index of assessment of general movements occurring spontaneous before 4 months age [15,16]-

- Abdominal muscle tone
- Delayed motor development

- Persistence of primary reflexes
- Most commonly symptoms and diagnosis typically occurs at the age of 2 years

Management outcome in CP depends on the age of diagnosis as early the diagnosis better is prognosis

The present study is based on the hypothesis that neural tissue remains same, as it never grows or multiply after birth and no available modern molecule can regenerate or repair damaged or diseased nerve cells thus a herbal composite of proven efficacy in helping repair and rejuvenation of nerve cells been evaluated in cases of Cerebral palsy

2. Material and Method

Objective of Study: Evaluation of therapeutic efficacy of herbal composite in management of Cerebral palsy.

2.1. Material

Patients attending at the Institute of Applied Neurology, Aarogyam punarjeevan, Ram Bhawan, Ara Garden Road, Jagdeopath, Baily Road, Patna 14 and RA. Hospital & Research Centre Warisaliganj (Nawada) Bihar been considered for the evaluation as per following criteria of selection and exclusion and were diagnosed as per -

Children with complaints of spasticity or dysfunction in limbs and delayed developmental milestones and already diagnosed cases of Cerebral Palsy were selected for this study.

Criteriia of selection	Criteria of exclusion
Children with CP upto 10 years of age Children with developmental delay and disability with mild, moderate, or severe degree.	Children >10 years of age Children with severe infectious diseases such as TB, meningitis Children with any major congenital malformations such as Congenital Heart Disease (CHD).

2.2. Methods

Parents of Selected patients were interrogated for antepartum, natal and postnatal history

Birth history:

Hospital /home delivery

Normal/assisted

Delayed labour

LSCS /HSCS

Antenatal drug history

Apgar score

Clinical stage:

History of any medication

Response of therapy taken

Patients were assessed for gross motor, gross motor functions and social personal status and were gradds as per following assessment scale [17,18]:

Motor function	Gradings
Head Holding:	0= No head holding I = Head erect and steady momentarily 2= Supine; lifts head when pulled up by arms 3= Prone,elevates self by arms and chest 4= holds head steady when moved around 5= Head balanced always
Sitting:	0= Not sitting at all 1= sits momentarily 2 – Sits for 30 s or more leaning forward 3 – Sits with the child's back straight 4 – While sitting, can manipulate a toy 5 – Raises self to sitting position
Standing:	0 – Does not stand at all 1 – Stands holding furniture momentarily 2 – Takes a few steps, both hands hold 3-Without support, can stand alone 4 – Stands up, all by himself by throwing weight on arms 5 – Takes a few steps without support.
Gross Motor Function Classification system for Cerebral Palsy (GMFCS) Level.[16]	
Fine motor	0 – No grasping at all/absent palmer grasp 1 – Tries to reach and holds thing with crude methods 2 – Tries to reach and holds things with good grip 3 – Transfers object from one hand to another hand 4 – Uses thumb and index finger and holds small object 5 – Uses end of thumb and index finger/neat pincer grasp.
Language:	0 – Unable to speak or produce sound at all 1 – Marked cooing 2 – Monosyllable 3 – Bisyllables 4 – Two words with meaning 5 – Makes simple sentence.
Personal and social	0 – Absent social smile and recognition 1 – Social smile and recognition 2 – Recognizing mother 3 – Anxiety in front of a stranger 4 – Attachment toward a toy and displeasure on taking it away 5 – Resists if toy is pulled 6 – Mimicry, understands spoken words and responds in an appropriate manner.

On the basis of above assessment score patients severity been graded as –

Mild:	if score of each >3
Moderate:	if score is 2
Severe:	if score is 1 or less

Selected patients were given a herbal composite constituting equal part (100mg) of Acorus calamus Herpestis monnieri, Cassia angustifolia, Nardostacachys jatamansi, Convolvulus pluricaulis in each 5ml in dose as per following –

<1 yr : 1.25 ml every 12 hrs
1-5 years : 2.5 ml every 12 hours
5-10 years : 5ml every 12 hours
Along with calcium , neuro vitamin and vitamin D_3 supplement

Effect of therapy been assessed and graded as –

Maximum:	More than 75% improvement of clinical signs and symptoms
Moderate:	More than 50-75% improvement of clinical signs and symptoms
Mild:	More than 25-50% improvement of clinical signs and symptoms
Non response:	Equal or less than 25% improvement of clinical signs and symptoms

3. OBSERVATIONS

Among 184 selected patients 116 were male and 68 were female, out of all 51 cases were of age <1 year while 71 were of <3 years though 6 cases were of >5 years age (Table -1, Pie diagram showing male female composition)

Out of all 96(52.2%) were delivered normally while 51(27%) through caeserian section and 100(54.3%) were with poor apgar score and 84(41.6%) with low birth weight (Table -2)

Among the selected patients 62 had taken various therapeutic including physiotherapy in last few year without having any improvement while rest 122 have not taken any medication and attended the centre for the first time, though 69 cases were detected during the treatment for other disease. (Bar diagram showing distribution of patient as per their disease status)

The commonest clinical presentation was speech problem in 82.6% cases while 52.7% presents with microcephaly, 44.8% with seizure and 12% with behaviour problem (Table showing distribution of patients as per clinical presentation)

Birth history reveals majority (64) with low birth weight, 59 premature delivery and 61 with poor Apgar score (not cried after birth)

Considering the severity of the presentation 32 were of severe, 60 moderate and 92 with mild grade of presentation (Bar diagram showing grade of severity)

Out of all 178 (96.7%) children shows grade I (excellent) clinical out come while 4(2.1%) and 2(1.1%) had grade II and grade III improvement. No patients had any drug adversity or agonizing clinical presentation or any alteration in haemato, hepato and renal function.

Table1. *Distribution of patients as per age and sex*

Age group (in year)	Number of patients		
	Male	Female	Total
< 1 year	**34**	**17**	**51**
1-3	**42**	**29**	**71**
3-5	**36**	**20**	**56**
>5	**04**	**02**	**06**
	116	**68**	**184**

Pie diagram showing Sex wise Composition of Patients

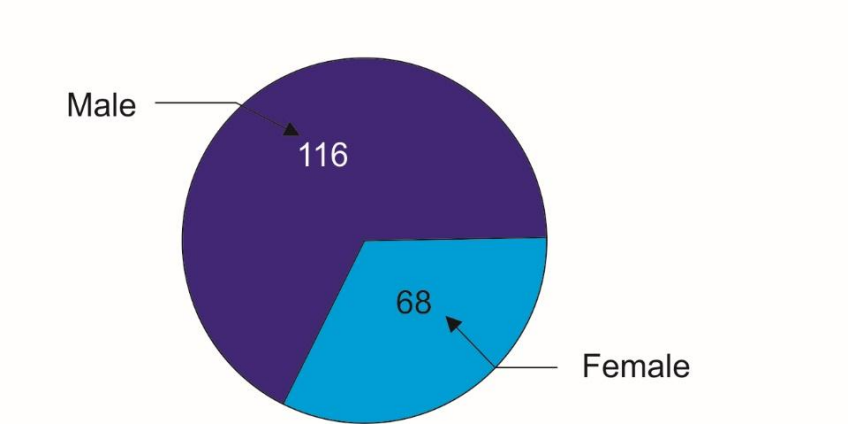


Table2. *Distribution of patients as per their birth history*

Particulars	Number of patients %	
Birth history :	96	52.2
Normal parturition Assisted parturition Forcep - 16 Episiotomy 21	37	20.1
Higher segment caeserian section	31	16.8
Lower segment caeserian section	20	10.9
Foetal status : Normal Low birth weight baby Premature Poor apgar score	 56 84 44 100	 30.4 45.6 24 54.3

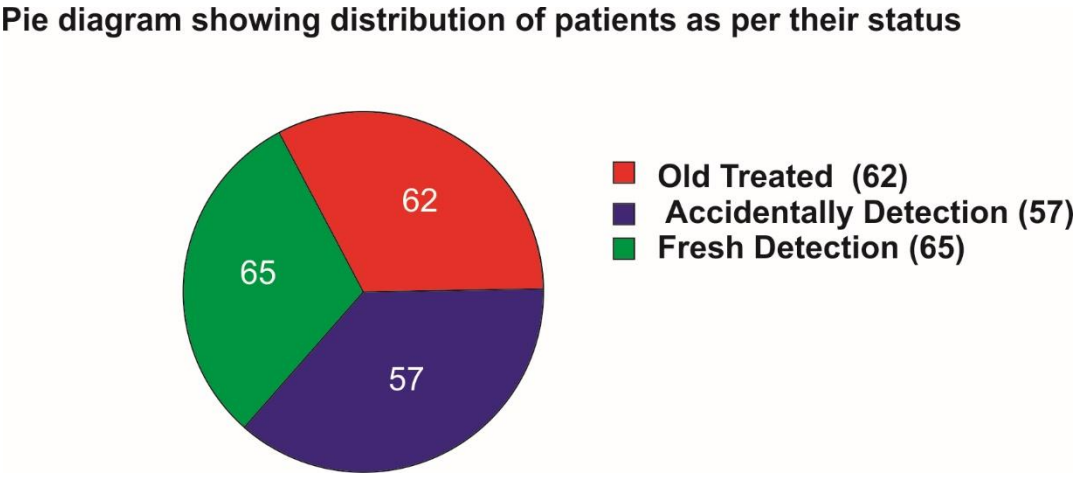


Table3. *Distribution of patients as per clinical presentation*

Presentation	Number	percentage
Speech problems	152	82.6
Microcephaly	97	52.7
Visual defect	70	38.04
Seizures	75	44.8
Malnutrition	64	34.8
Intellectual disability	62	33.7
Feeding problems	38	20.7
Hearing problems	19	10.3
Behavior problems	22	12

Table4. *Showing basic bio parameters*

Bio parameter	Number of patients	
	Before therapy	After therapy
Hematological		
Hemoglobin :		
<12gm%	134	02
>12gm%	050	182
Hepatic profile :		
Serum bilirubin –		
<1mg%	180	184
>1mg%	04	00
SGOT:		
<30 IU	180	184
>30 IU	04	00
SGPT		
<30 IU	180	184

>30 IU	04	00
Renal profile :		
Blood urea –		
<26mg%	182	184
>26mg%	02	00
Serum creatinine :		
<1.5mg%	184	184
Urine :		
Albumin		
Present	02	00
Absent	182	184

Bar diagram showing distribution of patient as per clinical severe

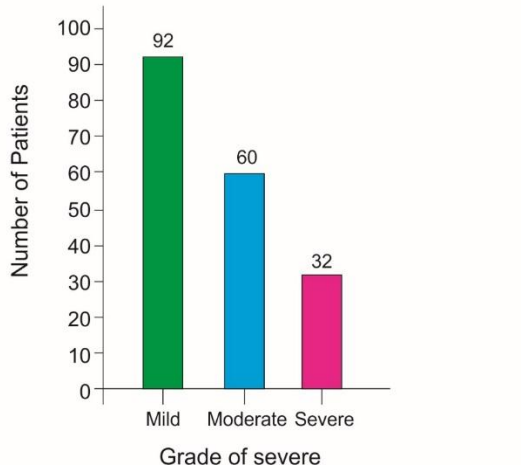
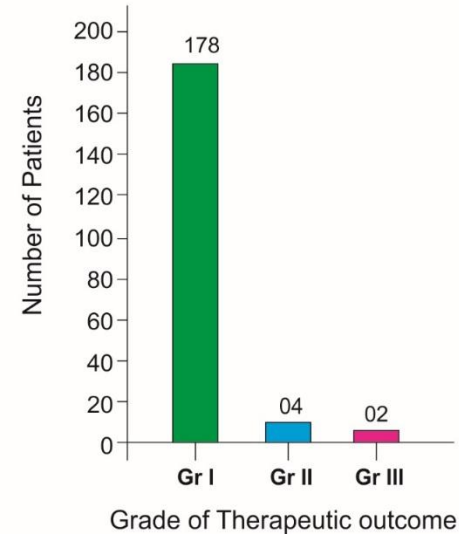


Table5. *Shows therapeutic outcome*

Index	**Number of patients**											
	Pre therapy						**Post therapy**					
Grades	0	1	2	3	4	5	0	1	2	3	4	5
Head holding	32	35	117	-	-	-	-	-	-	2	4	178
Sitting	32	40	112	-	-	-	-	-	-	2	4	178
Standing	32	59	93	-	-	-	-	-	-	2	4	178
GMFC level												
Fine motor	32	40	112	-	-	-	-	-	-	2	4	178
Language	32	55	97	-	-	-	-	-	-	2	4	178
Personal & Social	32	52	100	-	-	-	-	-	-	2	4	178

Bar diagram showing therapeutic outcome



4. Result and Discussion

4.1. Result

Herbal composite NEUROVIT ensure marked improvement in motor power, muscular tone and mental capabilities in patients of Cerebral palsy diagnosed and treated at early stage

4.2. Discussions

Cerebral palsy a chronic condition with considerable morbidity more in male and in lower middle class due to health ignorance unhygienic environment and lack of proper antenatal and obstetric care having increased risk multiple birth, neonatal asphyxia and premature delivery. Common symtoms and associated conditions observed in spastic quadriplegia and convulsive disorders.

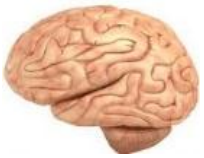
As no effective treatment for the underlying brain damage and all sophisticated technology are highly expensive and complicated therapies in the medical research field find a definite cure for the disease.

The present study reveals grade I clinical response in majority of early cases and improved quality of life in all the selected cases taking herbal composite NEUROVIT can be explained as -

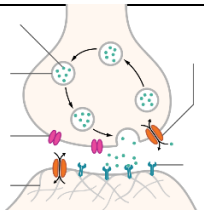
Physical and mental debility due to hypoxia, loss of GABA mediated inhibition of dentate granule and death of GABAergic inhibitory neuron results in attenuation of inhibitory control which in turn results in hyper excitation of the remaining neuron of the hippocampus. Mossy cells (located in dentate hilus, a part of hippocampus) are extremely sensitive to seizure induced neuronal death and damage following intense synaptic activator i.e., excite-tonic mechanism of activator of NMDA (N methyl D aspartate) a sub type of glutamate receptor which results in excessive intracellular calcium. Release of cellular zinc attenuate GABA response and induce hyper -excitability of neurons. GABA binds to GABA-A (coupled to calcium/chloride channel and a main target of currently prescribed drugs) as excitatory post synaptic potential are the main form of communication between neurons and is mediated by release of excitatory amino acid-Glutamate from presynaptic elements which is mediated by - NMDA (N methyl D aspartic acid/aspartate) - AMPA(Alpha-amino-3 hydroxy 5 methyl isoxazole propionic acid) kinate - Metabotropic GABA-B (Couples to potassium channel, a cause of latency and long duration of action) located in pre-synaptic element of an excitatory pre-neuron and inhibits pre-synaptic neuron by - direct induction of IPSP - inhibition of release of excitatory neuro transmitters Hence clinical supremacy of the adjunct indigenous composite can be attributed to bioregulative action of indigenous composites active ingredients for GABA neurodynamics i.e., Nardostachys jatamansi (Jatamansin, Jatamanose, Nardostachine) Herpestis monnieri(Monnerein) bio regulate GABA biokinetics and prompt neurovigorative while Acorus calamus (Acorin, Beta asarone and calaminidine) and Crotolaria verrucosa (crotallidine and verrucosin) acts as a neurogenic and helps in regeneration and repair of damaged neuron due to epileptic attacks thus improve and check neural debility and alleviate physical disability. In addition Convolvulus pluricaulis (Covolvulin) and Herpestis monnieri (Bacoside A & B) both promote neural growth due to activation of nerve growth factor-Tyrosine kinase A receptor, preserve m RNA level of muscarnic receptors and check accumulation of lipid and protein damage, thus improve both mental ability and capability. Hence bioregulation of altered GABA neuro kinetics prompt neurogenic action improve mental capability and physical capability.

Active ingradients of the composite help revitalization of the damaged or diseased nerve cells, improve neuro transmission by biregulating neuro transmismitter secretion, not only improves physical status i.e.- relieves paresis, improves muscle power, increases muscle bulk and improve deep tendon reflex, in addition also improves mental capability and IQ.

Acorus calamus *Bacopa monnieri*



NARDOSTACHYS JATAMANSI CONVOLVULUS PLURICAULIS
CASSIA ANGUSTIFOLIA(SEED)



(Schematic presentation of neurotropic action of Herbal composite)

Thus NEUROVIT herbal composite seems to be a boon for Cerebral palsy cases in improving quality of life restricting handicap and improving mental capability, earlier the supplement better the outcome

5. Conclusion

Cerebral palsy having no proven therapeutics in modern medicine shows promising result with herbal composite of proven neurogenic and neuro vitalising capacity in cases of cerebral palsy detected at early age i.e. <2 years while patients detected late Or tried various medication presenting with severe spasticity, have improvement in presentation i.e. muscle power and tone, spasticity and mental ability.

Thus this Herbal composite NEUROVIT is worth prescribing either alone or as an adjuvant in cases of Cerebral palsy as early as possible.

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