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Case Study

MANAGEMENT OF QUADRIPLEGIA INDUCED BY SPINAL CORD INJURY WITH *PANCHAKARMA* – A CASE STUDY

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ABSTRACT

A 30 year old male patient with quadriplegia induced by spinal cord injury was treated with *ayurvedic* medicine and *Panchkarma* therapies. Patient presented with quadriplegia and inability to sit/stand even with support and having no bladder/bowel control. Spinal Cord Independence Measure (SCIM) was 16 showing high dependence and also muscle wasting was present. Patient had history of swimming pool accident causing fracture C4-C5 spine and fixation through surgery in 2011. *Ayurveda* explains this disease as *Vatavyadhi*. *Snehana* and *Svedana* formed the first line of treatment to pacify the vitiated *Vata* while *Shalishashtikapindasveda* and *Matravasti* worked as *Balya* for *Mansa* and *Asthi dhatu* and also *Anulomana*. *Snehadhara* improves motor and sensory system resulting in improved function of all limbs. Management was done with repeated admissions for *Panchakarma* therapy during which overall strength and reflexes improved with Spinal Cord Independence Measure (SCIM) score reaching 47 from original 16 indicating improvement in independence of patient from complete dependence to partial independence in six months time.

KEYWORDS: *Matravasti*, *Panchkarma*, Quadriplegia, *Snehadhara*, *Snehana*, Spinal cord injury, *Svedana.*

INTRODUCTION

Paralysis can either be partial or complete. Paralysis of both the arms and legs has traditionally been called quadriplegia[1]. Quad comes from the Latin for four and plegia comes from the Greek for inability to move. The primary cause of quadriplegia is a spinal cord injury, but other conditions such as cerebral palsy and strokes can cause a similar appearing paralysis. The amount of impairment resulting from a spinal cord injury depends on the part of the spinal cord injured and the amount of damage done. Traumatic spinal cord injury[2] (SCI) can cause significant motor, sensory, and autonomic dysfunction caudally to the level of injury. The current constraints of the pharmacological treatment to restore spinal cord function after SCI in the clinical setting have led to numerous preclinical studies that have indicated novel rising neuro-protective and neuro-regenerative strategies with the potential to reduce neuronal death after central nervous system (CNS) injury. When the spinal cord is injured the brain cannot properly communicate with it and so sensation and movement are impaired. Examination of patient was completed by assessing Spinal Cord Independence Measure[3] (SCIM).

The classical text of *Ayurveda* explains these symptoms under the heading of *vatvyadhi*[4] *pakshaghata*[5, 6] and *Vata dosha* imbalance disorders[7]. *Pakshaghata* is a condition in which there is loss of power/function in both *Hasta* and *Pada*. *Snehana*[8], *Svedana*[9], *Anulomana & Snigdha Virechana*[10] are essential treatment for *Pakshaghata*. *Balya chikitsa* is required to restore the reduced power in the limbs and thus *Basti*[11], *Patrapinda sveda*[12], *Shalishashtika pindasveda*[13,14], *Snehadhara*[15,16] formed the line of treatment along with medicines.

Total of SCIM score was 16 showing complete dependence at the beginning of treatment which improved gradually over the months and reached 47 showing partial independence at the end of six months; proving remarkable recovery and a hope for the Spinal injury induced paralytic patients.

Case Report

A 30 years old Male patient of medium build from Hisar, Haryana, visited the OPD of Chaudhary Brahm Prakash Ayurved Charak Sansthan, Khera Dabar, Najafgarh, New Delhi on 12th March 2015 with the following chief complaints:

Patient name: ABC

Age and sex: 30 years Male

Built: Medium

Date of first visit: 12 March 2015

OPD & IPD No. 17442/ 936

Address: Hisar, Haryana

Chief complaints

1. Loss of power in bilateral upper and lower limbs.
2. Loss of control over bladder and bowel movements.
3. Inability to sit even with support.
4. Muscle wasting in bilateral upper extremities.

H/O present illness

Patient was asymptomatic till 9th July 2011, when he met with a swimming pool accident leading to fracture

in C4-C5 spine. He was treated locally and then at advanced care hospital where he was operated upon and fractured spine was fixated. Post surgery patient developed quadriplegia. Muscle wasting in bilateral upper limb was prominent.

Past history

Non diabetic, normo-tensive patient.

Modern Diagnosis

The patient is a pre diagnosed case of SCI induced Quadriplegia

Ayurvedic Diagnosis

Patient was diagnosed as a case of *Pakshaghata*

Date of First admission: 12/03/2015 to 23/03/2015

Date of Second admission: 06/04/2015 to 20/04/2015

Date of Third admission: 29/05/2015 to 26/06/2015

Date of Fourth admission: 21/07/2015 to 21/08/2015

Date of Fifth admission: 21/09/2015 to 31/10/2015

Total treatment schedule

Panchkarma chikitsa

1. ***Patrapinda sveda*** – with *Sahacharadi*[17] oil and *Balashwagandha (lakshadi)*[18] Oil for 12 days
2. ***Nadi sveda*** – *Sarvanga* - for 12 days
3. ***Basti chikitsa*** - ***Matra Basti*** with 60 ml Balaguduchyadi[19] Oil for 8 days

Phase II

4. ***Shalishashtika pindasveda*** – with *Balashwagandha (Lakshadi)* oil and *Dhanvantara*[20] Oil for 12 days
5. ***Nadi sveda*** – *Sarvanga* - for 12 days

Phase III

6. ***Shalishashtika pindasveda*** – with *Balashwagandha (lakshadi)* oil and *Dhanvantara* Oil for 14 days
7. ***Basti chikitsa*** – ***Matra Basti*** with 60ml *Balaguduchyadi* Oil for 14 days
8. ***Snehadhara –*** with *Balashwagandha (lakshadi)* oil, *Dhanvantara* Oil, *Dashmula*[21] Oil – for 14 days

Phase IV

9. ***Patrapinda sveda -*** with *Balashwagandha (lakshadi)* oil for 7 days
10. ***Shalishashtikapindasveda*** - with *Balashwagandha (lakshadi)* oil for 7 days
11. ***Basti chikitsa*** – ***Matra Basti -*** with 60 ml *Dashmula* Oil for 14 days
12. ***Snehadhara –*** with *Balashwagandha (lakshadi)* oil, *Dhanvantara* Oil, *Dashmula* Oil – for 14 days

Phase V

13. ***Snehadhara* and *Shalishashtikapindasveda*** – with *Balashwagandha (lakshadi)* oil and *Dhanvantara* Oil for 14 days
14. ***Snehadhara –*** with *Balashwagandha (lakshadi)* oil, *Dhanvantara* Oil, *Dashmula* Oil – for 28 days

Shaman chikitsa

1. *Trayodashang Gugglulu*[22] 2 tab thrice a day.
2. *Dashmula Kvath*[23] 40 ml twice a day.
3. *Balarishta*[24] 15 ml twice a day.
4. *Ashwagandha*[25] Ch 3 gm twice a day
5. *Eranda taila*[26, 27] 5 ml H.S. when *Basti* was not being administered.

Assessment criteria

Table 1: Spinal Cord Independence Measure (SCIM)

Self-care	SCORE
1. Feeding	
A. Needs parenteral, gastrostomy or fully assisted oral feeding	0
B. eats cut food using several adaptive devices for hand and dishes	1
C. Eats cut food using only one adaptive device for hand; unable to hold cup	2
D. Eats cut food with one adaptive device; holds cup	3
E. Eats cut food without adaptive devices; needs a little assistance (e.g., to open containers)	4
F. Independent in all tasks without any adaptive device	5
2. Bathing (soaping, manipulating water tap, washing)	
A. Requires total assistance	0
B. Soaps only small part of body with or without adaptive devices	1
C. Soaps with adaptive devices; cannot reach distant parts of body or cannot operate a tap	2
D. Soaps without adaptive devices; needs a little assistance to reach distant parts of body	3
E. Washes independently with adaptive devices or in specific environmental setting	4
F. Washes independently without adaptive devices	5
3. Dressing (preparing clothes, dressing upper and lower body, undressing)	
A. Requires total assistance	0
B. Dresses upper body partially (e.g. without buttoning) in a special setting (e.g. back support)	1
C. Independent in dressing and undressing upper body. Needs much assistance for lower body.	2
D. Requires little assistance in dressing upper or lower body	3
E. Dresses and undresses independently, but requires adaptive devices and/or special setting	4
F. Dresses and undresses independently, without adaptive devices	5
4. Grooming (washing hands and face, brushing teeth, combing hair, shaving, applying makeup)	
A. requires total assistance	0
B. performs only one task (e.g. washing hands and face)	1
C. performs some tasks using adaptive devices; needs help to put on/take off devices	2
D. performs some tasks using adaptive devices, puts on/takes off devices independently	3

E. performs all tasks with adaptive devices or most tasks without devices	4
F. independent in all tasks without adaptive devices	5
Respiration and Sphincter Management	
5. Respiration	
A. requires assisted ventilation	0
B. requires tracheal tube and partially assisted ventilation	2
C. breathes independently but requires much assistance in tracheal tube management	4
D. breathes independently and requires little assistance in tracheal tube management	6
E. breathes without tracheal tube, but sometimes requires mechanical assistance for breathing	8
F. breathes independently without any device	10
6. Sphincter management – Bladder	
A. indwelling catheter	0
F. assisted intermittent catheterization or no catheterization, residual urine volume > 100 cc	5
B. intermittent self-catheterization	10
C. no catheterization required, residual urine volume < 100 cc	15
7. Sphincter management – Bowel	
A. irregularity, improper timing or very low frequency (less than once in 3 days) of bowel movements	0
B. regular bowel movements, with proper timing, but with assistance (e.g. for applying suppository)	5
C. regular bowel movements, with proper timing, without assistance	10
8. Use of toilet (perineal hygiene, clothes adjustment before/after, use of napkins or diapers)	
A. requires total assistance	
B. undresses lower body, needs assistance in all the remaining tasks	1
C. undresses lower body and partially cleans self (after); needs assistance in adjusting clothes and/or diapers	2
D. undresses and cleans self (after); needs assistance in adjusting clothes and/or diapers	3
E. independent in all tasks but needs adaptive devices or special setting (e.g. grab-bars)	4
F. independent without adaptive devices or special setting	5
Mobility (room and toilet)	
9. Mobility in bed and action to prevent pressure sores	
A. requires total assistance	0
B. partial mobility (turns in bed to one side only)	1
C. turns to both sides in bed but does not fully release pressure	2
D. releases pressure when lying only	3
E. turns in bed and sits up without assistance	4
F. independent in bed mobility; performs push-ups in sitting position without full body elevation	5
G. performs push-ups in sitting position	6
10. Transfers: bed-wheelchair (locking wheelchair, lifting footrests, removing and adjusting arm rests, transferring, lifting feet)	
A. requires total assistance	0
B. needs partial assistance and/or supervision	1
C. independent	2
11. Transfers: wheelchair-toilet-tub (if uses toilet wheelchair – transfers to and from; if uses regular wheelchair – locking wheelchair, lifting footrests, removing and adjusting arm rests, transferring, lifting feet)	
A. requires total assistance	0
B.needs partial assistance and/or supervision, or adaptive device (e.g. grab-bars)	1
C. independent	2
Mobility (indoors and outdoors)	
12. Mobility indoors (short distances)	
A. requires total assistance	0
B. needs electric wheelchair or partial assistance to operate manual wheelchair	1
C. moves independently in manual wheelchair	2
D. walks with a walking frame	3
E. walks with crutches	4
F. walks with two canes	5

G. walks with one cane	6
H. needs leg orthotics only	7
I. walks without aids	8
13. Mobility for moderate distances (10-100 meters)	
A. requires total assistance	0
B. needs electric wheelchair or partial assistance to operate manual wheelchair	1
C. moves independently in manual wheelchair	2
D. walks with a walking frame	3
E. walks with crutches	4
F. walks with two canes	5
G. walks with one cane	6
H. needs leg orthosis only	7
I. walks without aids	8
14. Mobility outdoors (more than 100 meters)	
A. requires total assistance	0
B. needs electric wheelchair or partial assistance to operate manual wheelchair	1
C. moves independently in manual wheelchair	2
D. walks with a walking frame	3
E. walks with crutches	4
F. walks with two canes	5
G. walks with one cane	6
H. needs leg orthotics only	7
I. walks without aids	8
15. Stair management	
A. unable to climb or descend stairs	0
B. climbs 1 or 2 steps only, in a training setup	1
C. climbs and descends at least 3 steps with support or supervision of another person	2
D. climb and descends at least 3 steps with support of handrail and/or crutch and/or cane	3
E. climbs and descends at least 3 steps without any support or supervision	4
16. Transfers: wheelchair-car (approaching car, locking wheelchair, removing arm and foot rests, transferring to and from car, bringing wheelchair into and out of car)	
A. requires total assistance	0
B. needs partial assistance and/or supervision, and/or adaptive devices	1
C. independent without adaptive devices	2
Total Score (0 – 100)	

Table 2: Reflexes

	Score
Biceps Right	
Left	
Radial Right	
Left	
Triceps Right	
Left	
Abdominal (4 quadrants)	
Knee Right	
Left	
Ankle Right	
Left	
Plantar Right	
Left	
Scoring	
0	None, even with reinforcement
+	Only present with reinforcement
++	Normal
+++	Hyper reflexia
++++	With Clonus

Table 3: Power

	Score
Biceps Right	
Left	
Triceps Right	
Left	
Finger Grip Right	
Left	
Lower Limb Right	
Left	
Scoring	
0	No movement
1	Flicker of contraction
2	Movement with gravity eliminated
3	Movement against gravity
4	Movement against minimal resistance
5	Movement against full resistance/ Normal power

OBSERVATIONS

Table 4: Spinal Cord Independence measure

	On Admission	After 1st Treatment	After 2nd Treatment	After 3rd Treatment	After 4th Treatment	After 5th Treatment
Self-care						
1. Feeding	0	0	1	2	2	3
2. Bathing	0	0	0	1	1	1
3. Dressing	0	0	0	1	1	1
4. Grooming	0	0	0	0	1	1
Respiration and Sphincter Management						
5. Respiration	10	10	10	10	10	10
6. Sphincter management – Bladder	5	5	5	5	15	15
7. Sphincter management – Bowel	0	0	0	5	5	5
8. Use of toilet	0	0	0	0	0	1
Mobility (room and toilet)						
9. Mobility in bed & action to prevent pressure sores	1	2	2	2	2	3
10. Transfers: bed-wheelchair	0	0	1	1	1	1
11. Transfers: wheelchair-toilet-tub	0	0	1	1	1	1
Mobility (indoors and outdoors)						
12. Mobility indoors	0	0	1	1	1	2
13. Mobility for moderate distances	0	0	0	1	1	1
14. Mobility outdoors	0	0	0	0	1	1
15. Stair management	0	0	0	0	0	0
16. Transfers: wheelchair-car	0	0	0	0	0	1
Total	**16**	**17**	**21**	**30**	**42**	**47**

Table 5: Reflexes

	On Admission	After 1st Treatment	After 2nd Treatment	After 3rd Treatment	After 4th Treatment	After 5th Treatment
Biceps Right	0	0	+	+	+	++
Left	0	0	+	+	+	++
Radial Right	0	0	+	+	+	++
Left	0	0	+	+	+	++
Triceps Right	0	0	+	+	+	++
Left	0	0	+	+	+	++

Abdominal (4 quadrants)	0	0	0	+	+	++
Knee Right	0	0	+	+	++	++
Left	0	0	+	++	++	++
Ankle Right	0	0	+	++	++	++
Left	0	0	+	++	++	++
Plantar Right	0	+	++	++	++	++
Left	0	+	++	++	++	++

Table 6: Power

	On Admission	**After 1st Treatment**	**After 2nd Treatment**	**After 3rd Treatment**	**After 4th Treatment**	**After 5th Treatment**
Biceps Right	0	0	1	3	3	4
Left	1	1	1	3	3	4
Triceps Right	0	0	1	3	3	4
Left	1	1	1	3	3	4
Finger Grip Right	0	0	1	1	1	2
Left	0	0	1	1	1	2
Lower Limb Right	0	0	1	1	2	2
Left	0	0	1	1	2	2

DISCUSSION

General principle of treatment of *Vata dosha* is adopted in case of *Pakshaghata*. Also specific treatment of *Pakshaghata* which is *Nitya snigdha virechana* was included in the treatment line. *Snehana* and *Svedana* form the first line of treatment of *Vatavyadhi*. *Basti* is said to be best treatment for *vatvyadhi*[28] which pacifies the vitiated *Vata dosha*. *Mansa, Majja* and *Rasa dhatu* are majorly affected in this condition and are given strength by using *Balya* and *Rasayana chikitsa* as described below.

Patrapindasveda, *Nadisveda*, *Matravasti* for 12 days initially in which there was tingling and improved plantar reflexes in feet. In second round *Shalishashtika pindasveda* and *Nadisveda* were given for 12days, in which patient was able to remain seated without support for up to 30 minutes. In third round *Shalishashtika pindasveda* and *Matravasti* were given for 14 days and *Snehadhara* for 14 days, this increased the power in legs and patient was able to stand with support for 20 minutes and it also resulted in sensory improvement in both lower limb as patient was able to identify touch. In fourth round, *Patrapindasveda* was given for 7 days and *Shalishashtika pindasveda* for 7 days with *Matravasti*, followed by *Snehadhara* for 15 days resulting in increased mobility and power of upper limbs and improved reflexes. In fifth session *Shalishashtika pindasveda* was done for 14 days and *Snehadhara* for 28 days.

Patrapindasveda is a type of *Snigdha sankara sveda* which pacifies *Vata* and also opens the channels thereby improving circulation in the stiff muscles. *Vatanulomana* is also achieved by this treatment. *Shalishashtika pindasveda* is *Balya* and *Poshana* for *Mansa, majja and rasa Dhatu* thus pacifying the *Vata*, giving strength to *Asthi* and also improving muscle tone and reducing muscle stiffness.

Sahacharadi taila is *Anulomana vata-kaphaghna* and *Srotoshodhana* in nature resulting in pacification of *Vata* and opening the constricted channels in neuromuscular system. *Balashvagandha (lakshadi) taila* is *Vataghna* with *Poshana* properties thus nourishing *Mansa* and *Majja dhatu*. *Balaguduchyadi taila* is also *Vataghna* with *Pitta* and *Rakta poshana* qualities which help in improving the strength of muscles. *Dhanvantara taila* is having strong *Balya* properties; nourishing *Mansa*, *Asthi* and *Majja dhatu*. *Dashmula taila* is *Vata-kaphaghna* in nature and also proves useful in increasing strength of the tissues.

Snehadhara imparts strength to all the *Dhatus*, improves *Oja* and *Agni*, delays aging. It also improves motor as well as sensory system thus resulting in improved sensory as well as motor function of both the limbs and overall improvement in the nervous system of patient. All these treatments combined with *Basti* improve the neuromuscular system and we achieved promising results in the form of extended stability and duration in standing of patient, improved grip and sense of touch as well as gain in muscle tone. Patient's dependence on others for sitting, shifting and moving through wheel chair also improved significantly.

CONCLUSION

According to the observations in the present study, total SCIM score at the beginning of treatment was 16 showing complete dependence which improved gradually over the months and reached 47 showing partial independence at the end of six months; proving remarkable recovery and a hope for the Spinal injury induced paralytic patients. However there is still need for detailed studies to be done in this regard.

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