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YOGIC PRACTICES CAN IMPROVE THE BLADDER FUNCTIONS IN INCOMPLETE SPINAL CORD INJURY PATIENTS

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Abstract:

Objective: *To evaluate the effect of Yogic practices on Bladder functioning in incomplete Spinal cord injured patients.*

Methods: *This was a randomised control study. The study was conducted in the Department of Physical Medicine and Rehabilitation, C.S.M.M.U., Lucknow. A total of 60 patients were interviewed using a pre-tested semi-structured schedule between 16 to 60 years of age, diagnosed study cases of traumatic incomplete spinal cord injury (SCI) with neurological (both sensory & motor) impairment below thoracic (T12 level) with bladder & bowel involvement were included in the study. The duration of injury was more than 2 months, were divided randomly using random number table into 2 groups study group (received Yoga) (n=30) and control group (not received Yoga) (n=30) for 6 months. Patients were asked to come on 3rd and 6th month. Anthropometric measurements were also recorded. The paired t-test was used to compare the changes amongst follow-ups and unpaired t-test was used to compare between groups. The p-value<0.05 was considered as significant.*

Results: *At the baseline both the groups were similar in anthropometric and clinical parameters The bladder function score was insignificantly lower (p>0.05) in study group (1.43±0.57) as compared to controls at the baseline (1.73±0.83) and it is increased to 3.13 (±0.78) in study group after 6 months of Yoga and became to 2.13 (±0.78) in control group. The change in bladder function score was significantly (p<0.0001) higher in study group as compared to s control group from baseline to 3 and 6 months. There was 54.3% increase in bladder function score from baseline to 6 months in study group which was 18.8% in control group.*

Conclusion: *The finding of the study reveals that there is significant impact of Yoga in the management of Bladder among spinal cord injured patients.*

KEY WORDS:
Yoga, Bladder Function, Spinal Cord Injury .

INTRODUCTION

Spinal cord injuries commonly lead to paralysis; they involve damage to the nerves within the bony protection of the spinal canal. The most common cause of spinal cord dysfunction is trauma

(including motor vehicle accidents, falls, shallow diving, acts of violence, and sports injuries). Damage can also occur from various diseases acquired at birth or later in life, from tumors, electric shock, and loss of oxygen related to surgical or underwater mishaps1. The spinal cord does not have to be severed in order for a loss of function to occur. The spinal cord can be bruised, stretched, or crushed. Since the spinal cord coordinates body movement and sensation, an injured spinal cord loses the ability to send and receive messages from the brain to the body's system that controls sensory, motor, and autonomic function. Bladder problems occur as a result of damage to the spinal cord. The sacral nerves at the base of the spinal cord (s2,s3,s4 control bladder function, so virtually any level of spinal cord injury results in bladder control problems. Complications of bladder problems resulting from SCI include urinary tract infections, sepsis, dyssynergia, kidney stones or bladder stones and bladder cancer in those who use indwelling catheters for a long period of time.

The management of acute SCI should seek primarily to protect the individual from additional injury. It is mainly directed at the prevention of secondary injury and control of the systemic physiologic derangements resulting from the original injury. Most traumatic SCI occurs as a result of rapid cord compression because of a fracture-dislocation or burst fracture (Bunge et al, 1993). One necessary step is to decompress the swollen cord by removing damaging bone, disc, and ligament fragments. Early surgery is typically limited to individuals with continued neurologic decline and evidence from magnetic resonance imaging of acute compression (Esce and Haines, 2000).3 However, there is no standard of care regarding the role and timing of early surgical intervention because of insufficient data to support overall treatment standards. However, the clinical American Spinal Injury Association (ASIA) injury grade should not be used in the equation of who should receive early surgery, as has been the case in the past. Because of spinal shock, many individuals will present as ASIA A or a complete injury but will improve to a higher grade with resolution of spinal shock. Some animal data strongly suggest that early decompression (24 hours) can improve neurologic recovery and lower the rate of complications (Duh et al, 1994; Dimar et al, 1999). 4There is a lot of clinical uncertainty about surgical intervention and its time window in the setting of human SCI. Most studies cannot identify a difference in clinical outcomes between operated and non-operated patients (Fehlings et al, 2001).

METHODS

Study design: Randomized controlled trial.
Study site: Department of Physical Medicine and Rehabilitation, C.S.M.M.U., Lucknow
Study Subjects: A total of 60 patients were interviewed using a pre-tested semi-structured schedule between 16 to 60 years of age, diagnosed cases of traumatic incomplete spinal cord injury (SCI) with neurological (both sensory & motor) impairment below thoracic (T12 level) with and without bladder & bowel involvement were included in the study. The duration of injury was more than 2 months. All the patients in the study group continued to receive medical/physical treatment as advised by the treating surgeon. Study group (n=30) received additionally given specific yogic practices for a period of six months and control group (n=30) received a simulation technique. Both groups completed their follow up, considered for the analysis. The present study has the approval of the Institutional Review Board and informed consent was obtained from all subjects.

Approach: The subjects are randomized equally in two groups by the lottery method. The age, sex, duration of injury of the two groups were assessed at the baseline.

Outcome variable such as bladder function changes was observed under the supervision of its corresponding expert. Follow up data is collected at 3rd month and final at 6 th month.. Test and retest of the two groups were conducted in the same time and environment and the same time of the day. Before experimentation, all subjects were well taught about the measurement variables and their outcomes. The patients were also informed about the experimental risks, if any.

Procedure: After group allocation, respective subjects were experimented either with simulation or yogic intervention included with their medical/physical treatment. Both interventions were given as indivisual intervention by the same experimentor with the same intensity and capacity for 3 months (6 days in week). The duration of each individual session was 1 hour per day. The brief description and details of yogic intervention and simulation technique areas follows:

Yoga Intervention Programme for study group: The Study group were given daily Yoga session on 5 days in a week. Each session lasted for 60 minutes. The components of each session were in the following way –
- Initiation prayer - 2min

-Asanas- 30 min
-Pranayamas- 15 min
-Concentration with A-kar, U-kar and M-kar chanting- 10min
-Shantipath & closing prayer - 3 min

Simulation Technique for Control Group: This is the relaxation technique designed for the control group. According to this technique, first sit in any relaxation posture. Inhale deeply and exhale after a short while. Try to concentrate on past experiences full of sorrows. Concentrate on the same thought for some time. Release the mind from the above thought. Now try to concentrate on past experiences full of happiness. Concentrate on the same thought for some time. Now relax . This procedure takes 60 minutes daily.

Outcome variables: The autonomic parameters including bladder function is assessed by the Autonomic Function Examination Scale. (Alexander M, Biering-Sorensen F, Bodned D, Brackett N, Cardenas D, Charlifue S , Creasey G, et. al. International standards to document remaining autonomic function after spinal cord injury, Spinal Cord (2009) 47, 36–43; doi:10.1038/sc.2008.121; published online 28 October 2008.)

Statistical analysis: The results were presented in mean±sd and percentages. The repeated measures of analysis was used to compare changes from baseline to follow-ups and paired t-test was used to compare changes from baseline to 3 month, baseline to 6 month and 3 month to 6 month. The unpaired t-test was used to compare between groups. The p-value<0.05 was considered as significant. All the analysis was done by using SPSS 15.0 version.

Ethical consideration: The study was approved by the Ethical Committee of King George's Medical University. The consent from each subjects were taken before the enrolment in the study.

RESULTS

The baseline characteristics of the study cases and controls were similar (Table-1).

Changes in Bladder function

The bladder function score was insignificantly lower (p>0.05) in study group (1.43±0.57) as compared to controls at the baseline (1.73±0.83).

The bladder function score became 2.77 (±0.63) in study group after 3 months of Yoga and this became to 1.93 (±0.83) in control group. This again increased to 3.13 (±0.78) in study group after 6 months of Yoga and this became to 2.13 (±0.78) in control group. The change in bladder function score was significantly (p<0.0001) higher in study group as compared to s control group from baseline to 3 and 6 months. There was significant impact of time (follow-ups) in the increase in bladder score (p<0.0001). The increase in bladder score was significantly higher in study group as compared to control group from baseline to 3 months (p<0.0001), 3 months to 6 months (p=0.001) and baseline to 6 months (p<0.0001).

The percent change analysis showed that there was 48.4% increase in bladder function score in the study group from baseline to 3 months of treatments which was 10.4% in control group. Similarly, there was 11.5% increase in bladder function score from 3 months to 6 months in study group which was 9.4% in control group. However, there was 54.3% increase in bladder function score from baseline to 6 months in study group which was 18.8% in control group.

DISCUSSION

The study is a randomized controlled unmasked trial with two parallel limbs. Doing a randomized controlled trial (RCT) on yoga involves some inevitable compromises. There is no placebo for yoga, and the subject can not be blinded. Further, neither the control nor the experimental group can be denied the conventional treatment, if available. Therefore, we decided, as is a common practice in RCTs on yoga, to give only the conventional treatment to the control group, and to add the yogic treatment to the conventional treatment in the study group (yoga group). Thus, any difference in the efficacy of intervention in the two groups may be attributed to yogic intervention.

The various interventions administered under the omnibus title 'yoga' cover a very wide spectrum. This is inevitable because yoga is not a system of medicine; it is a way of life, the implications of which go beyond health and disease employed for prevention or management of disease, some convenient and highly visible elements of yoga are used selectively. In the present study, there was significant improvement in the bladder function scores of spinal cord injured patients. However, in our best

knowledge, there is no study which study the impact of Yoga on spinal cord injured patients, therefore, we could not compare our results with the findings of other studies.

Yoga is an ancient discipline that originated in early civilization on the Indian subcontinent and has been practiced throughout East Asia for over 5000 years. While yoga is fairly a new addition to evidence-based protocols in the U.S., Khalsa (2004) found over 150 studies, in which most demonstrated efficacious treatment with yoga in studies conducted in the U.S. and other countries, and in particular in India. Although many of these studies have not been empirically rigorous, much evidence implicates the utility of yoga for healthy populations (Pal, 2004) and for many health concerns, among them respiratory and autonomic dysfunction (Morse, 1980). Relaxation training and yoga interventions have become treatments of interest for the military. Anxiety and somatic symptoms have decreased following mind-body interventions, including yoga.

CONCLUSION

Yoga has much to offer in this modern, multitasking, sensory-overload age, especially for individuals with SCI. By cultivating a better presence in the entire body, yoga will cumulatively produce benefits that will greatly enhance quality of life. A serious limitation of study is lack of adequate sample size but this being the first study its kind on SCI patients, the error is deliberate as the objective of the study was to collect and report baseline data for future reference. There is a need for multicentre trials for adequate generalizability.

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Table-1: Baseline characteristics of the study group and control group

Age in years	Study group (n=30)		Control group (n=30)	
	No.	%	No.	%
Age in years				
< 20	4	13.3	4	13.3
20-25	9	30.0	8	26.7
26-30	4	13.3	9	30.0
31-35	8	26.7	5	16.7
> 35	5	16.7	4	13.3
Sex				
Male	28	93.3	28	93.3
Female	2	6.7	2	6.7
Duration of injury (in years)				
< 1	12	40.0	7	23.3
1-2	10	33.3	18	60.0
> 2	8	26.7	5	16.7

Table-2: Changes in Bladder function score

Follow-up	Study Group (n=30)	Control Group (n=30)
	Mean±sd	Mean ±sd
Baseline	1.43±0.57	1.73±0.83
3 months	2.77±0.63	1.93±0.83
6 months	3.13±0.78	2.13±0.78

Between groups- p=0.003, follow- ups- p<0.0001, between groups with follow-ups- p<0.0001, Baseline vs 3 months-p<0.0001, 3 months vs 6 months-p=0.001, Baseline vs 6 months-p<0.0001