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RECOVERY FROM STRESS IN TWO DIFFERENT POSTURES AND IN *SHAVASANA* – A YOGIC RELAXATION POSTURE

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Abstract : The recovery from induced physiological stress in Shavasana (a yogic relaxation posture) and two other postures (resting in chair and resting supine posture) was compared. Twenty one males and 6 females (age 21–30 yrs) were allowed to take rest in one of the above postures immediately after completing the scheduled treadmill running. The recovery was assessed in terms of Heart Rate (HR) and Blood pressure (BP). HR and BP were measured before and every two minutes after the treadmill running till they returned to the initial level. The results revealed that the effects of stress was reversed in significantly ($P < 0.01$) shorter time in *Shavasana*, compared to the resting posture in chair and a supine posture.

Key words : *shavasana* yoga stress relaxation

INTRODUCTION

Stress may be defined as the individual's perception about less than pleasant functioning of body organs, which in turn helps the individual to assess the environment (1). During such a physiological stress, the function of the organs is either inhibited or enhanced e.g. the digestion is inhibited whereas blood pressure and heart rate are increased. Although some amount of stress helps to improve one's ability, excessively high or low level of physiological stress adversely affects performance (2, 3, 4).

Various conventional as well as non-pharmacological methods, including progressive muscle relaxation are becoming popular for reduction of stress (5, 6, 7, 8, 9, 10).

Recently, *Shavasana,* a yogic relaxation posture, has been extensively used to prevent as well as control psychophysiological stress (11, 12, 13, 14, 15, 16, 17, 18). In one of the studies, the yoga practitioners, exposed to physiological stress showed better neuromuscular efficiency (19). However, there is little information available regarding the significance of Shavasana in recovering from an acute stress induced by physical exercise. The objective of the present investigation was to compare the efficacy of Shavasana, simple chair sitting and a lying down in the supine posture in recovering from exercise–induced stress.

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METHODS

Subjects (Ss) were 27 graduate students of Diploma in Yoga Education course (21 males and 6 females), 21–30 years of age, from G.S. College of Yoga and Cultural Synthesis, Kaivalyadhama, Lonavla (India) in the year 1994–95. These Yoga students were undergoing their daily yoga practices before coming to the laboratory. After completing the scheduled treadmill running i.e. 7 km. $hr.^{-1}$ 7 incl. grade, 5 min day^{-1} for males and 5 km. $hr.^{-1}$ 7 incl. grade, 5 min day^{-1} for females, each subject used to take rest in one out of the following three ways: sitting on a chair, lying supine, or Shavasana. Each mode of resting was studied on a different day. The experiments were conducted on an empty stomach in the morning from 8.30 to 9.30 a.m.

While resting in supine posture or on a chair the Ss were directed to keep their eyes open to avoid sleep. During Shavasana Ss closed their eyes and followed the standard technique (20) taught by the yoga instructor in the practical classes of yoga college. The two variables, viz. heart rate (HR in beats/min) and blood pressure (BP in mm Hg) were recorded in the initial resting conditions (Chair sitting and lying in supine position) and during recovery state 1.5 min after the scheduled treadmill running, in one of the three resting conditions, till HR and BP returned to the normal resting level. The recovery time for every subject was also noted. BP and HR were measured with the help of Automatic electronic sphygmomanometer from Omron company, Japan.

Chi-square test (21) followed by associated standard descriptive statistics were used for data analysis.

RESULTS

Percentage recovery from stress in chair sitting as indicated by HR, was 97.80%. In case of males and 93.80% in case of females, within 30 minutes time (Table I). In the same sitting posture and duration, 96.14% and 95.11% recovery in systolic blood pressure (SBP) was observed for male and female Ss respectively (Table II). The resting diastolic blood pressure (DBP) did not show any significant increase after the tread mill running. These results indicate that simple chair sitting and resting could recover the induced stress within the average period of 30 minutes (SD± 5.00).

In lying supine posture there was 98.96% and 98.29% recovery in HR in male and female Ss respectively, within the period of 24 minutes (Table I). The recovery in terms of SBP was 98.40% in males and 97.24% in females within the same duration. The DBP did not increase significantly after treadmill running or during resting period. It appears from the results that simple resting in lying (supine) posture could recover the stress within the average period of 24 min (SD ± 4.10) in male and female Ss.

In case of resting in *Shavasana* the male Ss showed 100% HR recovery within 12 min whereas an identical recovery rate was observed among female Ss within 10 min (Table I). It was also observed that SBP came to the normal level within 10 to 12 min in all the Ss (Table II). No significant change was observed in DBP as a result of

exercise. The results clearly indicate that *Shavasana*, a yogic relaxation posture, could lead to recovery from exercise stress within the average period of 10 min (SD ± 4.00).

Chi–square test (X^2 test) revealed that lying (supine) posture led to recovery of heart rate more quickly as compared to chair sitting. However, this difference was not statistically significant as shown in Table III (X^2=2.27 $P > 0.05$ in male Ss; X^2=1.90 $P > 0.05$ in female Ss).

Shavasana led to recovery of the HR and SBP significantly faster than chair sitting (X^2=34.49, $P < 0.01$ in males and X^2=41.69, $P < 0.01$ in females) and lying supine posture (X^2=20.24, $P < 0.01$ in males; X^2 =27.52, $P < 0.01$ in females). Fig. 1 explains that *Shavasana* not only led to recovery of the HR within 8 to 12 minutes but brought the HR even below the resting level. The relaxation was prominent from the 8th minute of *Shavasana* and this state was retained upto the 16th minute (Fig. 1). Thus the results indicate out of the three methods studied, *Shavasana* led to recovery from

TABLE I : Percentage wise HR recovery in three different postures (n = 27).

Posture	*Initial HR in resting condition*	*HR at the and of Treadmill running*	*Percentage of HR recovery in rest*					
			6 mins	*8 mins*	*10/12 mins*	*14 mins*	*16 mins*	*24/30 mins*
Mals Ss:								
Sitting	65.52 ± 6.27	123.95 ± 13.62	24.23%	33.01%	42.46%••	46.87%	48.96%	97.80%**
Lying (Supine)	63.48 ± 8.45	125.43 ± 12.88	30.58%	32.75%	45.21%••	45.21%	52.28%	98.96%*
Shavasana	64.86 ± 5.25	124.57 ± 12.62	80.24%	93.33%	100%••	108.14%	99.93%	
Female Ss:								
Sitting	74.00 ± 12.16	124.33 ± 12.11	22.51%	26.48%	47.02%•	56.96%	54.96%	93.80%**
Lying	69.00 ± 15.91	127.66 ± 9.62	28.98%	37.50%	58.38%•	65.90%	69.89%	98.29%*
Shavasana	72.33 ± 9.63	125.66 ± 12.19	42.49%	93.11%	99.74%•	104.36%	96.86%	

• = % recovery within 10 min; •• = % recovery within 12 min;
* = % recovery within 24 min; ** =% recovery within 30 min.

TABLE II : Percentage wise blood pressure recovery in three different postures (n=27).

Postures	*Initial BP in Rest condition*		*BP at the end of treadmill run*		*Percentage of recovery after*		
	systol (m±SD)	*diastol (m±SD)*	*systol (m±SD)*	*diastol (m±SD)*	*2 min*	*10•/12•• min*	*24*30** *min*
Male Ss							
Chair sitting	122.95 ± 9.44	77.62 ± 9.06	151.28 ± 9.59	82.19 ± 6.30	9.20%	–	96.14%**
Lying Supine	121.80 ± 9.66	77.43 ± 9.34	149.86 ± 9.06	84.43 ± 5.88	12.31%-	–	98.40%*
Shavasana	122.52 ± 9.66	77.62 ± 9.96	151.62 ± 7.96	81.71 ± 8.10	20.24%	98.28%••	–
Female Ss							
Sitting	119.17 ± 9.59	79.00 ± 9.07	137.66 ± 15.10	83.50 ± 8.79	10.12%-	–	95.11%**
Lying Supine	118.33 ± 9.71	77.83 ± 6.04	138.16 ± 14.94	79.16 ± 6.46	13.25%-	–	97.24%*
Shavasana	118.83 ± 9.20	77.83 ± 8.80	140.66 ± 14.42	79.66 ± 8.49	35.13%	100%•	–

+ = % recovery within 10 min; ++ = % recovery within 12 min;
* = % recovery within 24 min; ** = % recovery within 30 min.

TABLE III : CH I – square test indicating recovery in heart rate in three different postures.

Recovery time	*Posture*	*X^2 value for HR recovery in males*		*X^2 value for HR recovery in females*	
		Lying	*Shavasana*	*Lying*	*Shavasana*
2 min	Sitting	0.76	8.47	0.19	17.09
	Lying	–	7.06	–	14.12
4 min	Sitting	0.99	10.22*	1.2	22.05*
	Lying	–	12.28*	–	25.80*
6 min	Sitting	0.74	22.25*	0.81	43.11*
	Lying	–	30.03*	–	33.68*
8 min	Sitting	0.006	28.79*	1.90	41.69*
	Lying	–	29.11*	–	27.52*
10 min	Sitting	2.27	34.49*	2.00	39.33*
	Lying	–	20.24*	–	28.26*
12 min	Sitting	0.086	23.61*	–	–
	Lying	–	20.67*	–	–

*Significant at the P <.01 level

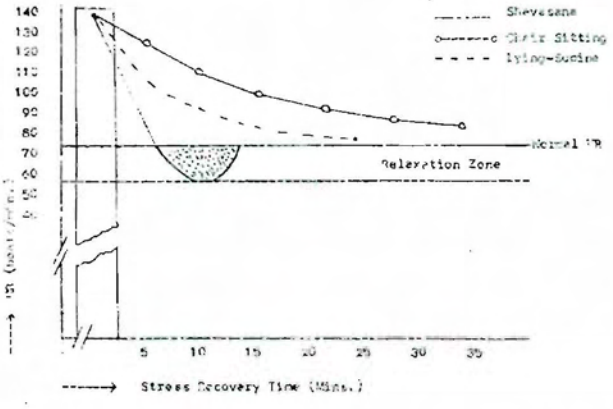

Fig. 1 : Physiological Stress Recovery in three different Postures (Chair sitting, Lying–supine and *Shavasana*)

stress within the shortest time and provided further relaxation in addition.

DISCUSSION

In this study the Ss underwent treadmill running which gave them a moderately high intensity exercise. Therefore, it was only to be expected that there would be a marked increase in heart rate and blood pressure. Since the Ss had no previous training in treadmill running, the exercise involved considerable stress. The results of this study indicate that the Shavasana led to recovery from the stress faster than sitting on a chair or lying supine. The time required for recovery from stress in chair sitting was the longest. Normally, HR and BP are slightly more in standing and sitting postures than in the lying down posture (22). Against this background it may be understood that the stress recovery time may also differ in sitting and lying postures, since there is an extra work load on the circulatory system against the gravitational force in sitting condition. In lying posture as well as in Shavasana the whole body remains in a well supported condition where the centre of gravity is nearest to the ground. Naturally, when the extensors and flexors are not required to work against the gravitational force, they are greatly relaxed. Thus the force required of the heart to pump blood against gravity is reduced to a great extent.

The question, however, arises that since Shavasana is also practised in lying supine

position, how it leads to faster recovery than simply lying down in the supine posture? In Shavasana the eyes are closed so that at least one of the powerful sensory input is cut off which may otherwise provoke the thought process. The subject shifts his attention to different parts of his body or concentrates only on the abdominal movements during breathing. Thus his awareness turns inward and gets diverted from the external objects as well from the endogenous thoughts. The analytical activity of the cortex is not given any scope and thus the anxiety or tension as well as other psychological accompaniments are reduced (23, 24, 25, 26) and the Ss experience complete relaxation and tranquillity. In such a condition the parasympathetic predominance is established. Such deep relaxation causes the reversal of the 'flight or fight' response (27, 28, 29) which results in maximum reduction of HR and BP, even below the normal resting level (Fig. 1).

Thus in conclusion, it can be stated that Shavasana can establish a psycho-physiological relaxation in such a way that the induced physiological stress is reduced significantly in a shorter time as compared to chair sitting or lying down in a supine position.

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