

EFFECTS OF RELAXATION TECHNIQUE ON SYMPATHETIC ACTIVITY IN PATIENTS OF MILD TO MODERATE HYPERTENSION

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ABSTRACT

Aim of the study

The aim of the study was to assess effects of Relaxation Technique (RT) on sympathetic activity in mild to moderate uncomplicated hypertensive patients.

Methodology

A prospective open label clinical study was undertaken. It was an ICMR sponsored short term undergraduate research project. The project was approved by institutional Ethical Review Committee. Subject for the study included mild to moderate, uncomplicated hypertensive patients who were attending medical OPD at JJ Hospital. After meeting inclusion criteria, each patient blood pressure pulse and respiratory rate was recorded. Patients were asked to practice mental and physical relaxation in the morning as well as in

the evening for about 20 minutes every day for two weeks. BP, pulse and respiratory rate was assessed every week for two weeks. The effect of relaxation was assessed by changes in BP, pulse and respiration before and after the intervention. Also, all the patients were broadly divided into sub-groups by direct questioning on their food habits and spirituality to evaluate effects of relaxation on such personal characteristics.

Results

There is significant decrease in diastolic BP and respiratory rate in all the patients. However, no significant change in systolic BP and pulse was observed. Among sub group of patients, spirituality and vegetarian food habits had significant reduction in diastolic BP, pulse and respiration while no significant difference was observed in non-vegetarian and no spirituality group.

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Conclusion

Physical mental relaxation might help in reducing sympathetic tone in some of the hypertensive patients within a short period of two weeks. This approach may be useful in management of some cases of hypertension.

INTRODUCTION

Indian Council of Medical Research encourage short term research project for undergraduate students to train them in research methodology under the guidance of their seniors¹. It is desired that the research project so selected need to be simple, clinically relevant and ethically acceptable.

In recent years, hypertension has become one of the major cardiovascular disorders associated with increased morbidity and mortality. According to one estimates as much as 5% of the urban population is suffering from various grades of hypertension with an estimated 10% below 35 years of age. Although, hypertension is due to multiple etiological factors ranging from neuropsychiatry and endocrine abnormalities to receptors and vascular defects^{2,3}, sympathetic over activity seems to be a common denominator in most of the patients⁴. Sympathetic Nervous System is highly sensitive to acute stress known as Acute Phase Response characterized by rise in blood pressure, tachycardia, tachypnoea, hyperglycemia, sweating, restlessness, and anxiety⁵. Chronic stress may increase sympathetic tone and set it at higher level⁶. Thus it can be postulated that hypertension, in some patients, is the consequence of chronic physical or mental stress which is amenable to those measures that provide physical and mental relief⁷. Incidentally, ancient techniques such as transcendental meditation, yoga, pranayam and

simple procedures to restore mental peace have shown beneficial effects in patients with hypertension⁸, Ischemic Heart Disease^{9,10}, Hypercholesterolemia¹¹.

In the present study, we have tried to evaluate effects of Relaxation Technique (RT) on sympathetic activity in mild to moderate hypertensive patients using BP, Pulse and Respiratory Rate (RR) as parameters. We also evaluated effects of RT among subgroups of patients based on their food habits and spiritually Subgroups were formed by direct questioning and consisted of either Veg-Non veg or Spiritual-No spiritual groups.

MATERIAL AND METHODS

The study was carried out at Medical (OPD) of JJ Hospital. The protocol was approved by Institutional Ethics Review Committee. A formal request was made to all the doctors working in medical OPD to refer cases of mild to moderate uncomplicated hypertension which is defined as Systolic BP between 130 to 180 mm of Hg and Diastolic BP between 90 to 110 mm of Hg. All patients were taking antihypertensive drugs at least for one month and asked to continue same treatment during entire period of the study. All patients participated in the study have approval from their physician and also gave informed written consent.

After screening and verification of eligibility criteria (Figure-1), patients were asked to give details about their food habits and spiritual practices by asking direct questions. Their BP, Pulse & RR were recorded after they were made to sit quietly for 10 minutes. BP was measured in supine position in right upper arm using same instrument by same investigator taking muffling sound (Vth Korotkoffs sound) as point for Diastolic BP. The patients were asked

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to visit Medical OPD at weekly interval for 3 weeks. At the end of one week, baseline measurements for BP, Pulse & RR were made. Subsequently, patients were given a lecture cum demonstration on Relaxation Technique at Clinical Pharmacology Unit of the department. In addition, they also received a written hand out in their own mother tongue describing details

of RT. The patients were advised to practice relaxation technique for 20 minutes every day in the morning and evening. At the end of the second week the patients were called for compliance reports about relaxation practice. On third visit, i.e. at the end of third week, the compliance report was reassessed. BP, pulse and respiration was recorded. (Figure - 2)

Fig. 1.: Selection criteria for the patients

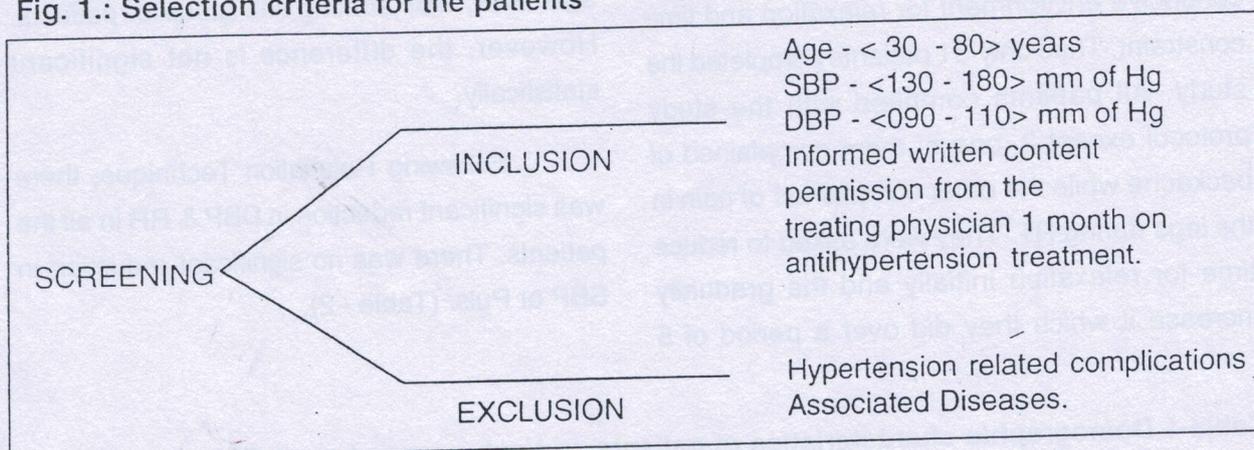
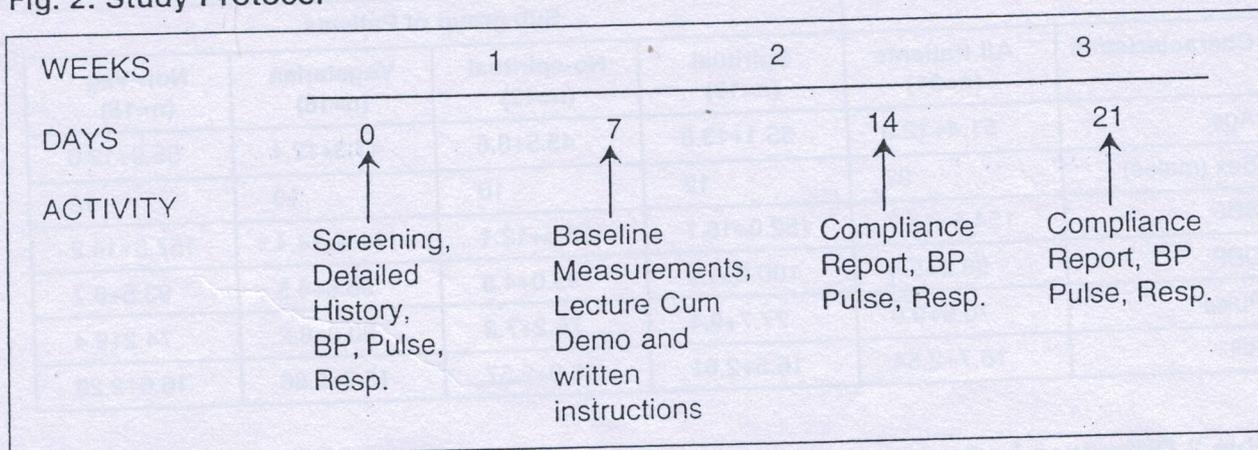


Fig. 2: Study Protocol



Data Analysis :-

The difference in treatment outcome i.e. BP, pulse, respiration before and after relaxation intervention was assessed using students paired "t" test. Significance was set at a value of $p < 0.05$. The difference in treatment outcome for BP, pulse and respiration was also measured in subgroups of patients based on food habits and spirituality. Students paired "t" test was used

to know the difference.

RESULTS:

Over a period of one month, 64 patients suffering from mild to moderate hypertension were referred to us by the doctors working in medical OPD. On screening, 14 patients were excluded from the study for not meeting inclusion criteria (3-extremes of age, 7-irregular

antihypertensive treatment, 4 refused to follow study protocol). Thus, 50 patients were initially recruited for the study. At follow up visit, at the end of first week, 12 patients did not turn up. Thus, a total of 38 patients were included for the study. Subsequently, at the end of 2nd week, 7 more patients were excluded for a variety of personal reasons, most commonly, lack of conducive environment for relaxation and time constraint. Thus only 31 patients completed the study. All patients complied with the study protocol except 2, one of them complained of backache while the other complained of pain in the legs during RT. They were asked to reduce time for relaxation initially and the gradually increase it which they did over a period of 5

days without any complaint of pain and thereafter continued relaxation technique as per protocol. These patients were included for statistical calculations.

Table - 1 shows demographic characteristics of the patients. As this was add-on, open label study, there is some variation in age. SBP, DBP among sub group of patients. However, the difference is not significant statistically.

Following Relaxation Technique, there was significant reduction in DBP & RR in all the patients. There was no significant reduction in SBP or Puls. (Table - 2).

Table-1 Demographic characteristics of patients and sub-groups (mean+SD)

Characteristics	All Patients (n=31)	Sub group of Patients			
		Spiritual (n=19)	No-spiritual (n=12)	Vegetarian (n=16)	Non-Veg (n=15)
Age	51.4+12.9	55.1+13.8	45.5+8.6	47.3+12.4	55.9+12.0
Sex (males)	22	12	10	10	12
SBP	154.5+14.7	152.0+16.1	158.5+12.1	151.4+14.4	157.8+14.2
DBP	98.2+5.4	100.2+4.9	95.0+4.8	96.6+4.5	93.5+8.7
Pulse	76.9+9.0	77.7+9.4	76.2+7.3	80.0+8.2	74.2+9.4
RR	16.7+2.54	16.5+2.61	16.9+2.57	16.7+2.86	16.6+2.29

Table 2 Difference in Systolic BP, Diastolic BP, Pulse and RR between baseline and after two weeks of Relaxation Practice in all patients and sub-groups. (mean+SD).

	All Patients (n=31)	Sub group of Patients			
		Spiritual (n=19)	No-spiritual (n=12)	Vegetarian (n=16)	Non-Veg (n=15)
SBP	-4.0+4.2	-5.4+3.6	-2.8+3.8	-4.4+3.2	-4.3+4.9
DBP	-3.0+4.7*	-6.1+3.1*	2.2+1.7	-4.3+5.6*	-1.7+3.8
Pulse	-3.2+6.9	-5.2+7.0	0.1+5.9	-6.6+5.7	0.1+6.8
RR	-1.6+2.3*	-2.4+2.0*	-0.2+2.5	-1.9+2.4*	-1.5+2.6

*P<0.05

Among subgroup of patients, RT has caused significant reduction in DBP. Pulse & RR in spiritual group while no difference is found in no-spiritual group. Significant difference is also found in DBP, Pulse & RR between baseline and post relaxation measurements in patients having vegetarian food habits. No significant difference in these parameters is found among patients having non-vegetarian food habits. None of the groups showed significant difference in SBP. (Table - 2)

DISCUSSION

The hypothesis that stress is important in the pathogenesis of hypertension is strengthened by the finding that Relaxation practices have significantly reduced blood pressure in mild to moderate hypertensive patients. Although, relaxation response has long latent period before any measurable change is evident, the present study has demonstrated significant changes in Diastolic BP, Pulse & Respiratory rate in two weeks of anti stress intervention in patients on anti hypertensive medication. The diastolic decrease reflects reduction in peripheral resistance consequent to decrease in sympathetic tone. The decrease is not associated with reflex increase in pulse as seen with anti hypertensive drug treatment¹². On the contrary, there is decrease in pulse along with decrease in diastolic pressure. This is desirable as relaxation practice seems to normalize basic defects without causing activation of compensatory mechanisms which is the essence of RT. However, there is no significant difference in systolic BP. This may be partly due to very short period of relaxation intervention. Also, some reports indicate different response to anti stress maneuver^{13, 14}

in hypertensive patients. In the present study, we found greater reduction in diastolic BP, Pulse & RR among patients with spirituality and/or non-vegetarian food intake. It appears that spiritual life in hypertensive patients enables them to accept the concept of anti stress approach in treatment of hypertension. Perhaps as corollary of this, they were able to gain much rest and relaxation. In the present study, we have not attempted any reduction in dose of the antihypertensive drugs but it is advisable to decrease the dose in those patients who respond favourably to RT. It is found to be safe, effective, simple and acceptable additional therapy for patients with mild to moderate hypertension.

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