THE EFFECT OF BRIEF RESTRICTED ENVIRONMENTAL STIMULATION THERAPY IN THE TREATMENT OF ESSENTIAL HYPERTENSION

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Summary—This pilot project investigated the effects of controlled frequent brief REST relaxation sessions on the blood pressure of three subjects with borderline essential hypertension. A flotation REST system was used, and subjects had 2 or 3 sessions weekly for 2 months. All three subjects had blood-pressure reductions of a clinically significant magnitude across the treatment and follow-up periods.

INTRODUCTION

Kammerman (1977) found that flotation coupled with taped message led to changes on some MMPI scales, and concluded that these changes reflected an increase in ego strength, decreased impulsiveness and increased stability of emotional adjustment. Lilly (1977) described the experience of salts solution flotation as one of "profound relaxation".

In our laboratory we have been examining the psychophysiological effects of sensory restriction using flotation Restricted Environmental Stimulation Therapy (REST). We hypothesized that this brief REST experience would be deeply relaxing, leading to a reduction of stress responding similar to that found with psychophysical relaxation procedures currently used in behavioral medicine. This report presents the result of frequent brief REST relaxation on the blood pressure (BP) and state anxiety of one subject with borderline essential hypertension, and on the BP of two other subjects with borderline essential hypertension.

METHOD

Procedure

REST chamber. The REST chamber (purchased from Samadhi Tank Co., No. D6) was a rectangular box 8' long, 4' wide and 42'' high, constructed of Styrofoam backed with black plastic. Twenty-gauge vinyl (similar to that in a waterbed) lined the box and contained saturated Epsom salts solution (sp. gr. 1.3). Temperature control of the solution (94.0 ± 0.5 F) was maintained through the use of a waterbed heater with a solid-state thermoregulator. The REST chamber was completely enclosed, eliminating light. Sound attenuation occurred since the ears were submerged in the solution during flotation. The S floated nude in supine position with his arms at his side (see Fig. 1). Sessions consisted of: (1) BP measurement; (2) a brief shower; (3) 40 min of REST relaxation; and (4) another brief shower.

Each BP reported is the average of three measurements taken 2 min apart. The Ss were seated for 5 min prior to any measurements. All measurements were made on a physiometrics automated BP system.

Subjects

Subject A—A 30-yr-old white male diagnosed by his personal physician as having essential hypertension. Our initial contact with this S was 1 yr prior to the beginning of the study, when he was referred to our Biofeedback Clinic for relaxation training for his BP. His pressure at the beginning of biofeedback-assisted (EMG) relaxation training was
130/88 while on diazide. After 2 months of training (8 sessions), he had eliminated his medication, and BP was 124/84. However, 9 months later when he participated in a separate REST study, he stated that his home BP readings had been high lately and that he had not been doing his home relaxation exercises for many months. A few weeks later, the S was contacted and invited to engage in brief REST relaxation sessions in which we would monitor his BP. The S consented and his REST sessions began the following week.

The Spielberger STAI X-1 self-report questionnaire was administered to him before and after each REST relaxation session and at noon on the day of each session. This S had 20 REST flotation sessions (40 min each) over a 2-month period, three sessions weekly on alternate days.

Subjects B and C—Our initial contact with these two Ss occurred when they took part in another REST experiment in which we were measuring blood pressures before and after REST. Both Ss were white, male medical students, one 25 and the other 28 yr of age. Both Ss had high initial pressures during that experiment. After a 2-week baseline period in which their pressures remained greater than a preselected criterion (140 systolic and/or 90 diastolic), they were offered the opportunity to participate in a REST program similar to that of S A. Both of these Ss had 20 REST flotation sessions over a 10-week period, two sessions weekly.

RESULTS

Subject A

Figure 2 represents the systolic and diastolic BP for S A across treatment and follow-up sessions. Baseline BP (140/96) was determined by averaging the measurements in the first four sessions. End of treatment BP (125/85) was determined by averaging measurements on the last four sessions. Short-term follow-up BP (124/84) was determined by averaging BP of four weekly non-flotation visits during the third month post-treatment. Long-term follow-up is reflected by the BP at 6 months (120/84) and at 10 months (116/80) post-treatment.

For S A state anxiety increased between noontime measurements (X 43.8 ± 0.9) and pre-REST relaxation measurements (X 46.1 ± 1.1). Post-REST relaxation measurements fell below both noontime and pre-REST measurements (X 33.8 ± 1.1).
Subject A was interviewed post-treatment and was asked for comments concerning differences between the REST relaxation and the biofeedback-assisted relaxation. He stated he did not experience deep relaxation as often in the biofeedback sessions as compared to the REST relaxation sessions. He reported that since the REST relaxation sessions, he has experienced longer periods of time when he is more 'even tempered' and is more aware of anxiety when it is 'coming on'.

Subjects B and C

Figure 3 represents the systolic and diastolic BP for Ss B and C. Baseline BP (B: 145/88, C: 145/84) was determined by averaging measurements taken over a 2-week period prior to REST. End of treatment BP (B: 138/83, C: 129/70) was determined by averaging BP measurements made on the last four treatment sessions. Short-term follow-up BP (B: 131/79, C: 128/73) is the average of BP measurements made twice weekly.
during the month following treatment. State anxiety was not measured in Ss B or C. Subject B stated that he felt more relaxed and did not become as anxious when under stress since his REST sessions. Subject C did not notice any difference in his behavior since his REST sessions, but did enjoy the REST sessions and felt he relaxed deeply during the sessions.

DISCUSSION

The results of this experiment demonstrate reductions in both systolic and diastolic blood pressure of a clinically significant magnitude occurring across treatment and follow-up sessions for all subjects. These results are particularly impressive considering that: (1) the REST relaxation program did not involve any daily practice of a relaxation exercise frequently utilized in other relaxation paradigms for blood-pressure reduction; and (2) Subject A’s previous failure to maintain a lowered pressure after biofeedback-assisted relaxation training. The results also demonstrate that for Subject A, REST relaxation sessions were associated with a reduction in state anxiety.

Caution should be used in interpreting the results of these studies. Blood pressure is susceptible to the ‘regression to the mean’ effect, which could partially account for the blood-pressure changes seen here. Blood pressure is also subject to the ‘placebo effect’ (Goldring et al., 1956); however, it is unlikely that the placebo effect alone could explain maintenance of the blood-pressure decrease over the extended follow-up period reported for Subject A. Single subjects also may have an idiosyncratic positive response to a particular treatment that may not generalize beyond the subject ( Blanchard, 1980). However, since the response of the three subjects to REST was similar, it is unlikely that the BP reductions seen were due to idiosyncratic responses. Although this study has certain methodological weaknesses (length of baseline, varying length of follow-up and use of laboratory pressures) the results strongly suggest a positive treatment effect of REST relaxation.

REST relaxation utilizes an environment to induce relaxation with the individual passively experiencing the process. This passive experiencing appears similar to the passive concentration of autogenic training or the passive attitude of relaxation response training, but does not include a cognitive strategy (i.e. repetition of phrases or a monosyllabic cue). The controlled repeated experiences of effortless passive relaxation provided by REST may provide an advantage over these other methods requiring a trial and error approach to the deep-relaxation state.

Controlled outcome studies of this approach are needed to determine: (1) its effectiveness with the general population of essential hypertensives; (2) the physiological and biochemical changes accompanying blood-pressure changes through this process; (3) its comparative effectiveness to other self-regulation approaches used for essential hypertension; and (4) the cognitive and affective changes that may occur during REST use and contribute to the success of this approach.

REFERENCES