Effectiveness of Hypnosis in Reducing Mild Essential Hypertension: A One-Year Follow-Up

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EFFECTIVENESS OF HYPNOSIS IN REDUCING MILD ESSENTIAL HYPERTENSION: A One-Year Follow-Up

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University of Paris 10, France

Abstract: The present study investigates the effectiveness of hypnosis in reducing mild essential hypertension. Thirty participants were randomly assigned to hypnosis (standardized, individual 8-session hypnosis treatment) or to a control group (no treatment). Results show that hypnosis is effective in reducing blood pressure in the short term but also in the middle and long terms. We did not find any relationship between the practice of self-hypnosis and the evolution of blood pressure or between anxiety, personality factors, and therapeutic results. The implications of the results of the psychological treatment of hypertension are discussed.

Essential hypertension affects 13% of the population and poses a major health problem for health professionals, because hypertension presents a risk of suffering a major cardiovascular event. Indeed, elevated blood pressure, systolic or diastolic, is the most significant risk factor for cardiovascular mortality at any age for either sex.

Enormous efforts have been made to effectively control hypertension and ameliorate its consequences. In addition to improved drug therapy, there has been increasing interest in the possibility of treating hypertension with nonpharmacological methods. This approach is based both on the long-term observation that at least part of the etiology of essential hypertension can be explained by psychosomatic factors and on the inherent problems of any drug therapy, namely side effects and poor compliance (for a review, see Rutledge & Hogan, 2002).

Nonpharmacological approaches to lowering high blood pressure have been tested in numerous studies. Techniques such as

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biofeedback (Agras, Southam, & Taylor, 1983; McCoy, Blanchard, Wittrock, & Morrison, 1988; McGrady & Higgins, 1989; McGrady, Woerner, Bernal, & Higgins, 1987), meditation (Sanderlin, 1991), relaxation (e.g., Amigo, Fernandez, A., Gonzalez, & Herrera, 2002; Hafer, 1985; Steptoe, Patel, Marmot, & Hunt, 1987), imagery (Young, 2000), or a combination of two of these techniques have been used (McCoy et al., 1988).

Among these techniques, hypnosis gave early proof of its effectiveness in altering physiological measures, including blood pressure (Shliffer, 1930; Stern, Winokur, Graham & Graham, 1961; White, 1940; Zinkin, 1930). This technique has proven to be effective in reducing blood pressure (Friedman & Taub, 1977; Kerr, 1988; Tosi, Rudy, Lewlis, & Murphy, 1992), as has the use of self-hypnosis (Case, Fogel, & Pollack, 1980), which has also established its effectiveness. Although studies using hypnosis are successful in lowering blood pressure in the short and middle term, they do not give any indication of effectiveness over a longer period of time. Therefore, it is of relevant interest to prove the long-term efficacy of hypnosis on hypertension.

Another important factor in establishing the efficacy of a clinical intervention is to determine whether there are individual differences in responses to the intervention. This question seems particularly relevant for hypnosis, because large individual differences exist in imagery skills (Denis, 1991; Lang, 1979, 1980; McKelvie, 1995), and because research on hypnotic susceptibility—a stable individual difference—has shown that hypnotic response is correlated with imagery factors (for a review, see Nadon, Laurence, & Perry, 1987).

The first aim of the present study is to investigate whether a controlled hypnosis treatment is effective in reducing mild essential hypertension. To this end, two experimental groups were created: a waiting-list control condition and a hypnosis condition in which participants followed a standardized eight-session hypnosis treatment.

The present study also addresses the question of whether hypnosis’s effectiveness is modified by individual differences in hypnotic susceptibility and mental imagery. To assess individual differences in imagery and hypnotic skills, we used several tests with which to evaluate the imagery skills in standard and in hypnotic conditions and the ability to respond to hypnotic suggestions.

**Method**

**Participants**

Thirty adults with high blood pressure volunteered to participate in the study, referred by their general practitioners. The participants were
told that they would be participating in a research project investigating the effectiveness of a psychological intervention, hypnosis, for hypertension.

The inclusion criterion was a diagnosis of essential hypertension at least 6 months earlier that had been ascertained by a general practitioner on the basis of regular clinical examinations. The patients had mild levels of essential hypertension: diastolic pressure equal to or greater than 80 mmHg and less than 105 mmHg and systolic pressure equal to or greater than 140 mmHg. Exclusion criteria were (a) nonessential hypertension; (b) medical problems requiring ongoing treatment; (c) psychological, neurological, or central nervous system disorders that would bias the understanding of the instructions; and (d) changes in treatment (medication) during the 3 months prior to the sessions.

People with moderate (diastole between 105 mmHg and 114 mmHg) and high levels of hypertension (diastole from 115 mmHg) were not used because of the risk of secondary medical problems requiring specific medication, such that it would have been difficult to differentiate the implication of the factors in the therapeutic results.

On the basis of these criteria, 45 people were selected for the first interview. Of these 45, 4 never came and 2 did not meet the selection criteria. Among the 39 who came to the first interview, 8 stopped their participation immediately after the interview.

The 31 remaining participants were randomly assigned to one of the two conditions with the restriction that each group would comprise the same number of participants with medication ($n = 16$ for the hypnosis condition, $n = 15$ for the control condition). One participant from the hypnosis condition dropped out after the second hypnotic training session, which left 15 in the hypnosis condition and 15 in the control condition.

All analyses were computed using data from the remaining 30 participants ($n = 15$ for the hypnosis condition, and $n = 15$ for the control condition), of whom 18 were women.

The participants were an average 47.10 years old ($SD = 11.69$), ranging from 22 to 60 years, mostly married, and two-thirds worked in a profession.

Considering health status, participants had been suffering from hypertension for 6.6 years ($SD = 4.2$), had a diastolic pressure between 87 and 102, $M = 87.9$ ($SD = 7.5$) and a systolic pressure between 140 and 188, $M = 156$ ($SD = 10.4$). The diastolic pressure in the experimental condition was $M = 88.7$ mmHg ($SD = 7.3$), and in the control condition $M = 87.2$ mmHg ($SD = 7.5$). The two conditions did not significantly differ in the diastolic pressure: $t(28) = -0.546, p = .06, ns$. The systolic pressure in the experimental group also does not show any difference from the control condition: for the experimental
condition, \( M = 153 \text{ mmHg (SD = 7.7)} \), for the control condition, \( M = 159 \text{ (SD = 12.1)} \), \( t(28) = 1.60, p = .251, ns \).

Twenty participants out of 30 took medicine: 15 were on beta-blockers (7 in the experimental condition, 8 in the control condition); 3 on angiotensin-converting enzyme inhibitors (1 in the experimental condition, 2 in the control condition), 1 was taking diuretics (in the experimental condition), and 1 taking vasodilators (in the experimental condition). There was no difference in blood pressure level between the participants according to the medication status, neither for the diastole, \( t(28) = 0.403, p = .69 \), nor for the systole, \( t(28) = 0.293, p = .77, ns \) (see Table 1 for the sample characteristics).

Table 1

<table>
<thead>
<tr>
<th></th>
<th>Total</th>
<th>Hypnosis</th>
<th>Control</th>
</tr>
</thead>
<tbody>
<tr>
<td>N</td>
<td>30</td>
<td>15</td>
<td>15</td>
</tr>
<tr>
<td>Women</td>
<td>18</td>
<td>10</td>
<td>8</td>
</tr>
<tr>
<td>Men</td>
<td>12</td>
<td>5</td>
<td>7</td>
</tr>
<tr>
<td>Mean Age</td>
<td>47.2 (11.76)</td>
<td>47.9 (11.03)</td>
<td>46.6 (12.5)</td>
</tr>
<tr>
<td>Marital Status</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Married</td>
<td>25</td>
<td>12</td>
<td>13</td>
</tr>
<tr>
<td>Divorced</td>
<td>2</td>
<td>2</td>
<td>0</td>
</tr>
<tr>
<td>Single</td>
<td>3</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Professional activity</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>19</td>
<td>9</td>
<td>10</td>
</tr>
<tr>
<td>No</td>
<td>11</td>
<td>6</td>
<td>5</td>
</tr>
<tr>
<td>Hypertension Meds</td>
<td>20</td>
<td>10</td>
<td>10</td>
</tr>
<tr>
<td>Beta-blockers</td>
<td>15</td>
<td>7</td>
<td>8</td>
</tr>
<tr>
<td>Diuretics</td>
<td>1</td>
<td>1</td>
<td>–</td>
</tr>
<tr>
<td>Vasodilators</td>
<td>1</td>
<td>1</td>
<td>–</td>
</tr>
<tr>
<td>ACE inhibitors</td>
<td>3</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Mean Yrs of Hypertension</td>
<td>5.8 (7)</td>
<td>7.5 (2.06)</td>
<td></td>
</tr>
<tr>
<td>( M ) Systolic Pretreatment</td>
<td>156 (10.4)</td>
<td>153 (.76)</td>
<td>159 (1.21)</td>
</tr>
<tr>
<td>( M ) Diastolic Pretreatment</td>
<td>88 (.73)</td>
<td>89 (0.72)</td>
<td>87 (0.75)</td>
</tr>
<tr>
<td>( M ) Anxiety Intensity (VAS)</td>
<td>7.50 (3.15)</td>
<td>8.33 (2.44)</td>
<td>6.66 (3.61)</td>
</tr>
<tr>
<td>( M ) SHSS:C</td>
<td>4.49 (3.03)</td>
<td>3.17 (2.35)</td>
<td>5.80 (3.12)</td>
</tr>
<tr>
<td>QMI</td>
<td>110.17 (18.22)</td>
<td>110.73 (19.40)</td>
<td>109.6 (17.63)</td>
</tr>
<tr>
<td>IDQ Imagery</td>
<td>15.73 (3.72)</td>
<td>15.06 (4.18)</td>
<td>17.26 (3.20)</td>
</tr>
<tr>
<td>IDQ Verbal</td>
<td>14.87 (6.41)</td>
<td>12.47 (6.61)</td>
<td>17.26 (5.92)</td>
</tr>
<tr>
<td>Vividness of Imagery</td>
<td>3.10 (.99)</td>
<td>2.78 (1.25)</td>
<td>3.42 (.51)</td>
</tr>
</tbody>
</table>

Note. No differences in any variable describing participants’ characteristics were observed between the two groups, according to ANOVAs for parametric measures and Mann-Whitney’s test for nonparametric measures, except for IDQ-V, \( p < .05 \) and SHSS:C, \( p < .05 \). VAS = Visual Analogue Scale; QMI = Questionnaire on Mental Imagery; IDQ = Individual Differences Questionnaire.
Measures

Health Status

Blood pressure was assessed independently by the general practitioner (GP) before treatment, at the end of the treatment, and at 6- and 12-month follow-ups.

Medication was reported at each assessment (type and dosage).

A visual analogue scale (VAS) was used to assess anxiety, ranging from 0, no anxiety, to 10, extreme anxiety, because the reliability and validity of the VAS has been established (Huskisson, 1983). We chose such a scale rather than an anxiety questionnaire for two reasons: (a) we did not want the participants to focus on their anxiety, because anxiety was not our main target; (b) it was easier to use such a simple scale over the telephone for the control condition during the sessions and for both conditions during follow-up.

Cognitive Status

Hypnotic susceptibility was assessed by the Stanford Hypnotic Susceptibility Scale, Form C (SHSS:C; Weitzenhoffer & Hilgard, 1962, French version from Baroussa & Leclerc, 1991). This 10-item scale assesses motor and cognitive responses to suggestions. It comprises three factors: (a) ideomotor inhibition (negative visual hallucination, arm rigidity, arm immobilization, anosmia), (b) difficulty factor (hand lowering, moving hands apart, dream, age-regression), and (c) positive hallucinations (hallucinated voice, mosquito hallucination, taste hallucination). It is based on relaxation induction and contains inhibitory suggestions (e.g., eyes closing, arm rigidity), and cognitive suggestions (e.g., visual hallucination, amnesia). The induction and the 10 suggestions take an hour to administer.

Imagery ability under hypnosis was measured in a procedure lasting about 20 minutes. It was similar to the therapeutic hypnotic session with the exception that no hypertension adaptation was suggested. Immediately after opening their eyes, participants answered questions assessing imagery vividness. The questions are directly derived from Sheehan’s Questionnaire of Mental Imagery: 0, no image; 1, not vivid; 2, moderately vivid; 3, vivid; 4, as vivid as reality.

Measures of imagery ability using questionnaires were the following: the Betts’s Questionnaire of Mental Imagery, (QMI; Betts, 1909; Sheehan, 1967), reviewed by Sheehan (1967), and the Individual Difference Questionnaire, (IDQ; Paivio, 1991).

Self-Hypnosis

Frequency of self-hypnosis was measured by self-report in two different ways. During the 8-week training sessions, self-hypnosis was measured at every session, using a scale from 0 to 7, corresponding to
the number of days the participants practiced in the preceding week. During the follow-up, it was not possible to be so precise, because we contacted the participants after 6 and 12 months. For this reason, we evaluated the average practice during the last 6 months on a scale of 6 points, from 0 to 5 (0, no practice; 1, about once a month; 2, about twice a month; 3, once a week; 4, several times a week; 5, every day).

**Experimenter**

The experimenter was a postdoctoral clinical psychologist. She assessed all psychological measures and had treatment guidelines specifying the content of each intervention session.

**Procedure**

All 30 selected participants who came to the medical office took part in two pretreatment sessions of 2 hours each. They gave their informed consent to the research duration (14 months) and to the necessity of maintaining their medical treatment during the experiment. They were also informed that they would be randomly assigned to one of the conditions and that the control group would not comprise any psychological treatment. They were also informed of the confidentiality of the study and that they would be fully debriefed at the end of the follow-up period, according to deontological rules (Caverni, 2000).

They had then to answer questions about medication, health status, anxiety, and the SHSS:C. During the second assessment session before treatment, they all had to answer three questionnaires (QMI, IDQ) and questions concerning the vividness of imagery. Vividness of imagery and SHSS:C were assessed at the end of each session because these measurement procedures might induce a kind of somnolence and could thus influence the response to other assessments.

Participants were then randomly assigned to one of the two conditions and informed by telephone.

The participants in the hypnosis condition then took part in 8 weekly individual sessions of 30 minutes each in a clinical consulting room (the treatment procedure is described below). At the beginning of each session, they reported on self-hypnosis practice.

The control condition participants only came for the two assessment sessions before treatment.

After the treatment was discontinued (after 8 weeks) and at the 6- and 12-month follow-ups, blood pressure was assessed by the GP for all participants. The psychologist called the participants to assess the anxiety level on the VAS and, for the hypnosis condition, to assess the level of self-hypnosis practice.

After the 12-month follow-up, participants were thanked and fully debriefed by the psychologist at the medical office.
Treatment Procedures

**Hypnosis condition.** The procedure is based on an indirect procedure. Hypnosis restricts the individual’s perceptions of the external world by focusing his or her attention on specific internal stimuli, such as breathing. This attentional focus results in feelings of being removed from the environment and activates specific cognitive processes involving mental imagery. Participants were asked to sit in an armchair, close their eyes and tell the experimenter about a pleasant vacation memory. The procedure started with a standardized relaxation induction. We chose it because direct inductions may generate resistance in patients. Participants were asked to relax their muscles and to be aware of proprio- and interoceptive sensations. This procedure lasted about 5 minutes. Then, participants were asked to imagine a pleasant holiday memory for about 5 more minutes. While participants were supposed to be involved in their imagery activity, they were encouraged during the following 15 minutes to remember another positive memory from their childhood (age regression) involving well-being. Psychologically pleasant feelings (excitement, calmness, joy, curiosity, surprise) were activated while it was suggested that bodily functions remained relaxed. The type of memory was specified for each session and involved children’s games and symbolic events (Christmas, birthday). This age regression was encouraged but not forced, as not everybody is able to experience it.

For each session and type of memory, the experimenter read a standardized script that evoked general images of well-being. These images were connected to indirect suggestions of blood pressure regulation. At the end of the session, participants were instructed to let the memories go like a pleasant dream, to practice self-hypnosis as often as possible, and to come back to the present. Each session lasted about 30 minutes.

The procedure never directly referred to hypertension. The reasons for the choice of an indirect procedure using neither direct nor posthypnotic suggestions are related to the fact that we wanted the participants to mobilize personal resources, which is considered by Erickson to be the basis of therapeutic success, especially of long-term response (Erickson & Rossi, 1981). Thus, the activation of personal knowledge and procedural memory in the participants should lead to a better response to the therapy. Moreover, an approach based on age regression seemed to be of particular interest as our population is likely to be more involved in the training when having the opportunity to enjoy old, pleasant memories.³

³A standardized script can be obtained from the author.
Self-hypnosis practice suggestions were given at the end of each hypnotic session. Participants were also directly encouraged to practice at home but not obliged so they would not feel uncomfortable if they did not practice. They were told to sit down in an armchair, to close their eyes, to relax, to let a nice memory occur in the same way they did during the sessions, and to practice once a day for half an hour.

Control condition. These participants did not receive any psychological treatment. They only came to the evaluation sessions and were then assessed over the telephone.

RESULTS

The present study investigated (a) the efficacy of hypnosis in reducing blood pressure and (b) the individual variables (hypnotic susceptibility, imagery) that may mediate the potential effect of the experimental manipulation. All analyses were computed using the statistical software SPSS 14 for Windows.

Treatment Efficacy

To test for treatment efficacy, a $2 \times 4$ MANOVA was performed on the systolic and diastolic scores, with the treatment group (control, hypnosis) as a between-subjects factor and measurement time (8 weeks after treatment onset, on the 6-month and the 12-month follow-up) as a within-subjects factor.

Diastolic Pressure

The treatment group effect was significant in decreasing diastolic blood pressure, $F(1, 28) = 10.22, p < .003$, but the measurement time was not significant, $F(3, 84) = 1.87, ns$. It appeared to be significant only when the first two measurement times were considered, using a $2 \times 2$ MANOVA, $F(1, 28) = 4.39, p < .045$. That is, the diastolic blood pressure remained stable after treatment in both conditions.

One-way ANOVAs were performed at each time of measurement to examine the variations in the difference. As expected, no differences were found at the first measurement time before the treatment was initiated, $F(1, 28) = .30, ns$. Eight weeks after the treatment started, a main effect in the treatment group was observed, $F(1, 28) = 18.26, p < .0001$. The measurement taken 6 months after treatment onset also revealed a main effect in the treatment group, $F(1, 28) = 10.75, p < .003$. Finally, the hypnosis and the control groups also differed significantly at the 12-month follow-up with a main effect of treatment group, $F(1, 28) = 10.78, p < .003$. Table 2 illustrates the pattern of change in diastolic blood pressure.
### Table 2

**Diastolic Scores at Baseline, During Treatment, and on Follow-Up as a Function of Group and Measurement Time**

<table>
<thead>
<tr>
<th>Measurement time</th>
<th>Group</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Hypnosis</td>
</tr>
<tr>
<td>Before treatment</td>
<td>88.7(7.3)(^a)</td>
</tr>
<tr>
<td>After 8 weeks</td>
<td>80.0(5.3)(^b)</td>
</tr>
<tr>
<td>On 6-month follow-up</td>
<td>81.2(8.3)(^b)</td>
</tr>
<tr>
<td>On 12-month follow-up</td>
<td>82.1(8.3)(^b)</td>
</tr>
</tbody>
</table>

*Note.* Means not sharing a common superscript (\(^a\) or \(^b\)) differ significantly (\(p < .05\)).

### Systolic Pressure

The treatment group effect was significant in decreasing systolic pressure, \(F(1, 28) = 15.49, p < .001\), as well as the measurement time, \(F(3, 84) = 9.32, p < .001\).

One-way ANOVAs were performed at each time of measurement to examine the variations in the differences. As expected, no differences were found at the first measurement time before the treatment was initiated, \(F(1, 28) = 2.63, ns\). Eight weeks after the treatment started, a main effect in the treatment group was observed, \(F(1, 28) = 10.22, p < .0003\). The measurement taken 6 months after treatment onset also revealed a main effect in the treatment group, \(F(1, 28) = 13.98, p < .001\). Finally, the hypnosis and the control groups also differed significantly on the 12-month follow-up with a main effect in the treatment group, \(F(1, 28) = 13.87, p < .001\). Table 3 illustrates the pattern of change in systolic blood pressure.

### Anxiety

As shown in Table 4, anxiety scores decreased dramatically in the hypnosis condition, with a significant treatment group effect, \(F(1, 28) = 85.83, p < .001\), as well as a significant measurement time, \(F(2, 56) = 37.36, p < .001\).

One-way ANOVAs were performed at each time of measurement to examine the variations in the difference. As expected, no differences were found at the first measurement time before the treatment was initiated, \(F(1, 28) = 2.19, ns\). Eight weeks after the treatment started, a main effect in the treatment group was observed, \(F(1,28) = 7.35, p < .01\). The measurement taken on the 12-month follow-up also differed significantly with a main effect in the treatment group, \(F(1, 28) = 13.32, p < .001\). Tables 4 and 5 show the evolution of anxiety scores at the different times in the procedure.
Table 3
Systolic Scores at Baseline, During Treatment, and on Follow-Up, as a Function of Group and Measurement Time

<table>
<thead>
<tr>
<th>Measurement Time</th>
<th>Group</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Hypnosis</td>
</tr>
<tr>
<td>Before treatment</td>
<td>153(7.7)(^a)</td>
</tr>
<tr>
<td>After 8 weeks</td>
<td>140.3(10.1)(^b)</td>
</tr>
<tr>
<td>On 6-month follow-up</td>
<td>140.9(7.8)(^b)</td>
</tr>
<tr>
<td>On 12-month follow-up</td>
<td>144.4(7.1)(^b)</td>
</tr>
</tbody>
</table>

Note. Means not sharing a common superscript (\(^a\) or \(^b\)) differ significantly (\(p<.05\)).

Table 4
Anxiety Scores at Baseline, During Treatment, and on Follow-Up as a Function of Group and Measurement Time

<table>
<thead>
<tr>
<th>Measurement Time</th>
<th>Group</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Hypnosis</td>
</tr>
<tr>
<td>Before treatment</td>
<td>8.33(2.44)(^a)</td>
</tr>
<tr>
<td>After 8 weeks</td>
<td>3.58(2.75)(^b)</td>
</tr>
<tr>
<td>On 12-month follow-up</td>
<td>3.22(1.56)(^b)</td>
</tr>
</tbody>
</table>

Note. Means not sharing a common superscript (\(^a\) or \(^b\)) differ significantly (\(p\le.05\)).

Table 5
Difference Scores of Anxiety at Baseline, During Treatment, and on Follow-Up Compared to Baseline

<table>
<thead>
<tr>
<th>Measurement Time</th>
<th>Group</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Hypnosis</td>
</tr>
<tr>
<td>After 8 weeks</td>
<td>4.75</td>
</tr>
<tr>
<td>On 12-month follow-up</td>
<td>−5.11</td>
</tr>
</tbody>
</table>

Self-Hypnosis

Most of the participants in the experimental condition regularly practiced autohypnosis between the hypnosis sessions, \(M=3.89\) (\(SD=2.13\)): 40% trained at least five times a week, that is, almost every
day. This level of practice tends to diminish during the follow-up, $M = 2.53$ ($SD = 1.86$). Fifty-three percent of the participants did not practice or practiced less than twice a month, 27% practiced about once a week, and 20% continue to practice several times a week. People who regularly practiced self-hypnosis during the treatment aimed to go on practicing it afterwards ($r = .54$, $p < .048$).

There is no significant relation between anxiety and blood pressure, whether systolic or diastolic.

**Mediating Effect of Anxiety and Self-Hypnosis on Blood Pressure**

Correlations were computed between all systolic and diastolic scores and anxiety. No correlations were significant, suggesting that anxiety does not mediate the blood-pressure level. No significant relations were found between the level of the systolic and diastolic blood pressure and the practice of self-hypnosis, either during the 8 weeks of treatment or during the follow-up. During treatment, participants who trained at home less than four times a week obtained results similar to those who practiced four times or more a week with regard to systolic pressure, $t(13) = 0.88$, $p = .39$, $ns$; and diastolic pressure, $t(13) = -.47$, $p = .65$, $ns$. During the follow-up, the results are similar: the participants who practiced self-hypnosis several times a week (scores $\geq 4$) did not significantly differ from those who did not practice or practiced less with regard to diastolic pressure at both follow-ups: at the 6-month follow-up, $t(13) = 0.27$, $p = .79$, $ns$; at the 12-month follow-up, $t(13) = 0.81$, $p = .13$, $ns$. Similar results were obtained with regard to systolic pressure, at the 6-month follow-up, $t(13) = 0.70$, $p = .50$, $ns$; at the 12-month follow-up, $t(13) = 0.83$, $p = .42$, $ns$.

**Moderating Effect of Cognitive Factors**

Table 6 shows the different parameters for the distribution of the scales and questionnaires used. From these values, we can conclude that they are sufficiently sensitive for the distributions. The variables are normally distributed, except for the imagery vivacity under hypnosis (skew and kurtosis $\leq |1|$).

Surprisingly, we did not register any significant relations between the cognitive factors (QMI, IDQ, SHSS:C, vividness of imagery under hypnosis). Multiple regressions were computed on the systolic and diastolic blood pressure scores, with the potential moderators. None of these potential predictors show a significant impact on the blood pressure, systolic or diastolic. They do not show any impact either on anxiety or on the practice of self-hypnosis. These analyses are therefore not reported. The test conclusion concerning the lack of effect is probably caused by the small size of the sample.
Table 6
*Characteristics of the Distribution of the Scores to the Different Scales and Questionnaires Used*

<table>
<thead>
<tr>
<th></th>
<th>N=30</th>
<th>Minimum</th>
<th>Maximum</th>
<th>Mean</th>
<th>(SD)</th>
<th>Skewness</th>
<th>Kurtosis</th>
</tr>
</thead>
<tbody>
<tr>
<td>QMI</td>
<td>68</td>
<td>68</td>
<td>137</td>
<td>110.17</td>
<td>(18.22)</td>
<td>−.37</td>
<td>−.57</td>
</tr>
<tr>
<td>IDQ-I</td>
<td>8</td>
<td>8</td>
<td>21</td>
<td>15.73</td>
<td>(3.72)</td>
<td>−.62</td>
<td>−.61</td>
</tr>
<tr>
<td>IDQ-V</td>
<td>4</td>
<td>4</td>
<td>25</td>
<td>14.87</td>
<td>(6.41)</td>
<td>−.15</td>
<td>−1.09</td>
</tr>
<tr>
<td>SHSS:C</td>
<td>0</td>
<td>0</td>
<td>10</td>
<td>4.49</td>
<td>(3.03)</td>
<td>.27</td>
<td>−.89</td>
</tr>
<tr>
<td>Vivacity/hypnosis</td>
<td>1</td>
<td>1</td>
<td>4</td>
<td>3.19</td>
<td>(1.00)</td>
<td>−1.07</td>
<td>−.14</td>
</tr>
</tbody>
</table>

Note. QMI = Questionnaire of Mental Imagery; IDQ-V = Individual Difference Questionnaire – Verbalizers; IDQ-I = Individual Difference Questionnaire – Imagers; SHSS:C = Stanford Hypnotic Susceptibility Scale, Form C.

**Discussion**

**Summary and General Implications**

The first aim of the study was to assess the efficacy of hypnosis training for the treatment of essential hypertension. The present data show that hypnosis is effective, as both the systolic and diastolic pressure remained significantly lower after the training. This reduction was significantly different from the control condition and was maintained up to the 1-year follow-up. It is thus important to point out that individual hypnosis training is very effective in the treatment of essential hypertension and can be a real supplement to drug therapy. This kind of training, which is passive, is not very demanding for patients; it does not involve conscious-coping mechanisms and is therefore very well accepted.

**Anxiety**

The decrease in blood pressure occurs independently of the evolution of anxiety, whether systolic or diastolic, and the data show no significant relation between anxiety and blood pressure.

Hypnosis has a strong effect on anxiety: before the training, 80% of the sample had high or very high anxiety scores, and at the end of the training 77% demonstrated no further anxiety symptoms. Surprisingly, the treatment effect improves in the long run, with 86.6% of the people showing no anxiety. The effectiveness of the anxiety decrease is independent of the initial level of anxiety. These results are in strong contrast to the control condition, in which anxiety scores remain very high and stable over time, significantly different from those of the experimental condition.
Autohypnosis

The decrease in blood pressure occurs independently of autohypnosis practice, whether systolic or diastolic, and the data show no significant relation between autohypnosis and the evolution of blood pressure.

The practice of self-hypnosis does not exert an impact on the evolution of the blood pressure, either during the 8 weeks of hypnosis training or during the follow-up. These results tend to confirm those obtained by Friedman and Taub (1977), who did not observe any influence of autohypnosis during the hypnosis training. This lack of impact during the hypnosis sessions can be attributed to the hypnosis procedure itself, which may have been strong enough to mask the effects of self-hypnosis, or to an inadequate practice due to insufficiently precise instructions, that is, to a lack of control on the procedure by the psychologist.

This impact does not appear during the follow-up: it is not necessary to practice to keep normal blood pressure and the fact of doing regular practice does not prevent the rise in blood pressure. Its impact does not appear for anxiety either: the results obtained during the hypnosis training tend to remain stable and even to improve during the follow-up, whatever the level of autohypnosis practice.

To prove more precisely the impact of autohypnosis on essential hypertension, future studies will have to (a) assign participants to conditions that may or may not include autohypnosis; (b) assign people to conditions that include different methods of self-hypnosis (by listening to an audiotape, by giving very precise instructions, etc.); and (c) examine what people do exactly when they practice, to know what they are actually doing when they say they are doing self-hypnosis. That is, the qualitative content of self-hypnosis must be checked.

Personality Factors

The personality factors traditionally associated with the hypnotic scales do not show any impact on the therapeutic response. This is probably because the participants are all hypnotizable and have imagery ability. Indeed, several studies have shown an indirect association between imagery ability and therapeutic response. Thus, weak imagery ability is connected with weak hypnotic scores (Council, 1999) and if it is not necessary to be very hypnotizable to obtain therapeutic results, people who are hypnotizable tend to react more (Hall, 1983; Hall, Minnes, & Olness, 1993; Spanos, Victoria, & Gwynn, 1990). However, we could not confirm the results obtained in other studies, which showed a connection between the vividness of imagery under hypnosis and the therapeutic response (Spanos et al., 1990; Gay, 2004; Gay, Philippot, & Luminet, 2002).
Weaknesses

The present study suffers from a relatively limited number of participants, a common limitation in studies recruiting patients. This small number might have led to small effects, but one could then question the clinical significance of such effects. However, more participants might have helped to clarify the role of individual differences, such as imagery and suggestibility in the therapeutic area.

Direction for Future Research

The present study evaluated the effectiveness of eight weekly hypnotic sessions. It showed the effectiveness of hypnosis in the short and middle run but failed to demonstrate the stability of the result in the long run. Considering these results, future studies might directly manipulate the number and the rhythm of hypnotic sessions, to determine the best therapeutic pattern in the long run. It is also important to determine the impact of home practice on the evolution of blood pressure. To further explore the impact of autohypnosis on hypertension, future studies might also assign participants to conditions that may or may not include home practice.

References


Die Effektivität von Hypnose bei der Reduktion von leichter essentieller Hypertonie: Eine 1-Jahr-Folgestudie

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L’efficacité de l’hypnose dans le soulagement de l’hypertension artérielle essentielle bénigne : Un suivi effectué après un an

Marie-Claire Gay

Résumé: La présente recherche porte sur l’efficacité de l’hypnose dans la réduction de l’hypertension artérielle essentielle bénigne. Trente participants ont été sélectionnés au hasard pour recevoir un traitement hypnотique (traitement individuel standardisé étalé sur huit séances) ou pour ne recevoir aucun traitement (groupe témoin). Les résultats démontrent que l’hypnose abaisse efficacement l’hypertension artérielle, non seulement à court terme, mais aussi à moyen et à long terme. Aucun lien n’a pu être relevé entre la pratique de l’autohypnose et l’évolution de la pression artérielle, ni entre l’anxiété, les facteurs de personnalité et les résultats thérapeutiques. Sont traitées dans cet article les implications des résultats du traitement psychologique de l’hypertension artérielle.

Johanne Reynault

C. Tr. (STIBC)

La eficacia de la hipnosis para reducir la hipertensión esencial menor: Un seguimiento de 1 año

Marie-Claire Gay

Resumen: Este estudio investiga la eficacia de la hipnosis para reducir la hipertensión esencial menor. Asignamos aleatoriamente a treinta
participantes a un grupo de hipnosis (tratamiento estandarizado individual de 8 sesiones) o al grupo control (no tratamiento). Los resultados muestran que la hipnosis es eficaz para reducir la presión arterial a corto, mediano y largo plazos. No encontré ninguna relación entre la práctica de la auto-hipnosis y la evolución de la presión arterial o entre la ansiedad, los factores de personalidad, y los resultados terapéuticos. Discuto los resultados del tratamiento psicológico de la hipertensión.

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