THE EFFECTS OF IMAGERY ON ATTITUDES AND MOODS IN MULTIPLE SCLEROSIS PATIENTS

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Objective • To determine the efficacy of imagery for influencing attitudes and moods in multiple sclerosis patients.

Design • Experimental pretest-posttest, control-group.

Setting • Outpatient group in Central Pennsylvania.

Patients • 33 patients with mean ages of 43.93 years in the imagery group and 46.33 years in the control group. All subjects previously were identified with multiple sclerosis.

Intervention • Control group subjects followed their typical medical protocol and completed pretest and posttest measures. Imagery group subjects completed pretest and posttest measures and participated in a six-session group process that included brief exposure to relaxation training and ongoing work with biologically oriented imagery. Relaxation training and imagery were practiced on a daily basis. Imagery group subjects also produced imagery drawings, which were assessed after the third and sixth sessions.

Main Outcome Measures • Profile of Mood States, State-Trait Anxiety Inventory, Health Attribution Test, Imagery Assessment Tool, and Multiple Sclerosis Symptom Checklist.

Main Results • Imagery group subjects demonstrated significant reductions in state anxiety and significant alteration in their illness imagery because of feedback obtained during the study.

Conclusion • Use of the relaxation/imagery protocol led to clinically significant reductions in state anxiety. Imagery may be assessed through drawings that allow for positive modification of the imagery material to increase its utility and power. (Alternative Therapies in Health and Medicine. 1996;2(5):75-79)

Multiple sclerosis (MS) is a potentially debilitating disease of the central nervous system that affects the bodies and psychological states of MS sufferers. It is a demyelinating disease, the exact cause of which has not yet been determined, in which destroyed myelin is replaced by plaques of hardened tissue. Unfortunately, there is no clearly understood cause, cure, or authoritative treatment. No definitive neurological or laboratory test has been developed. The diagnosis depends on evidence of multiple central nervous system lesions (which may become manifest in such signs as numbness, tingling, weakness, paralysis, and so on), as well as the exclusion of other causes. The diagnosis may take months or even years.

Few controlled studies examining psychological interventions in the treatment of MS have been done. The need for such studies is critical for several reasons. Not only can MS be very disabling, but the seemingly random attacks and associated flare-ups may heighten one’s sense of vulnerability and loss of control. Adapting to the frustrating and potentially embarrassing physical symptoms may have adverse effects on self-esteem. Accompanying psychological distress also may include anxiety, depression, and poor body image. Medical treatments tend to be costly, and may involve negative consequences such as side effects associated with the administration of medications. The rate of MS continues to grow, as there is no possibility at present to prevent MS development (ie, no MS “vaccine” exists). Effective psychological treatments would serve to decrease emotional distress and empower patients to develop a sense of control of their illness, allowing them to improve their level of functioning.

Imagery is a psychological process that invokes and uses the senses, and which mediates the communication between perception, emotion, and bodily change. Imagery as a mind-body treatment intervention makes use of this communication process to facilitate psychophysiological or emotional changes. It is a technique that affects immune system functions and lessens stress through a decrease in sympathetic arousal. Whereas stress and immune system effects are implicated in MS, imagery may represent a potentially useful tool in the armamentarium of MS treatment. Biologically oriented imagery has been used in the treatment of a wide variety of medical conditions and chronic illnesses including cancer, diabetes, and chronic pain.

METHOD

Subjects in the study were adult volunteers, diagnosed with MS, ambulatory, aged 26 to 60 years, and residing in the Central Pennsylvania Outpatient Group.
Participants were recruited through a newsletter and announcements at support group meetings of the local chapter of the Multiple Sclerosis Society.

This study made use of an experimental pretest-posttest, control-group design. Subjects who met the inclusion criteria were randomly assigned to either the imagery (treatment) or control group. Thirty-three subjects completed the study: 15 in the imagery (treatment) condition and 18 in the control condition. The mean age for the subjects in the imagery (treatment) group was 43.93 years; the mean was 46.33 years in the control group. A total of 86.67% (n=13) of the subjects in the imagery group were female; 66.67% (n=12) in the control group were female.

Imagery group subjects completed assessment and treatment components of the study, whereas the control group subjects completed only the assessment component. Subjects in both conditions continued to receive their standard medical treatment.

Imagery group subjects participated in six 1-hour group sessions that involved the use of general, progressive relaxation training in the first session and a biologically oriented imagery treatment process for MS in subsequent sessions. In this process the subjects focused on developing relaxation and imagining repair of damaged myelin as well as positive immune system responses. Imagery group subjects were provided with audiotapes of the relaxation and imagery protocols at the conclusion of the second group session, and were asked to practice the imagery protocol on a daily basis for the remainder of the study.

Imagery also was used in an assessment protocol, as subjects in the imagery group drew pictures representing their imagery associated with the MS disease and treatment process. The drawings, along with interview information collected during the third session, were rated through use of an Imagery Assessment Tool (IAT). The results of the initial IAT ratings allowed for feedback to be presented to the subjects to strengthen the imagery. Imagery drawings also were assessed with the IAT at the conclusion of the study.

MEASURES

This study incorporated measures to assess the presence of psychological symptoms. The Profile of Mood States (POMS) consists of 65 five-point adjective rating scales and identifies six primary factors: tension-anxiety, depression-dejection, anger-hostility, vigor-activity, fatigue-inertia, and confusion-bewilderment. Internal consistency of the six factors was near .90 or above, whereas test-retest reliability for the six factors ranged from .61 to .69. Concurrent validity has been established for the tension-anxiety factor using the Taylor Manifest Anxiety Scale ($r=.80$), and for the depression-dejection factor using the Beck Depression Scale ($r=.61$).

The State-Trait Anxiety Inventory (STAI) is a 40-item self-report inventory designed to assess state and trait anxiety. Test-retest reliability correlations for the STAI are reported to range from .65 to .86, whereas internal consistency coefficients are nearly .90 or higher, with a median coefficient of .93. Concurrent validity has been established, using the Institute for Personality and Ability Testing anxiety scale ($r=.75$–.77) and the Taylor Manifest Anxiety Scale ($r=.73$–.85).

The Health Attribution Test (HAT) is a 22-item self-report inventory designed to measure beliefs about causes and cures of illness. There are three scales: the Internal scale measures the degree to which people control their physical health, the Powerful Others scale measures the degree to which individuals believe medical professionals are responsible for their health, and the Chance scale measures the degree to which individuals believe fate or other uncontrollable factors influence health. The combination of these three scales yields a HAT profile code that reflects an individual’s general health beliefs. Obtained test-retest reliability for the three scales ranges from .75 to .85, whereas split-half reliability ranges from .75 to .92. Reported interscale correlations range from .08 to .43.

An MS Symptom Checklist including a range of typical MS symptoms was developed by the investigator and derived from the literature of the Multiple Sclerosis Foundation. The checklist allowed for an additional comparison of symptom status for the imagery and control groups. MS symptoms, equally weighted, were summed for each subject.

Each of these instruments were administered as pre- and posttests to subjects in both groups. Test forms and the checklist were mailed to each participant the week prior to and the week after the study, with self-addressed, stamped envelopes for the return of the instruments.

Imagery protocols obtained from the imagery group subjects were analyzed using the IAT, which is derived from three longer standardized instruments: Image-CA, developed for cancer patients; Image-SP, developed for spinal pain patients; and Image-DB, developed for diabetes patients. Subjects are asked to draw their imagery associated with the disease process, their inner healing resources, and imagery associated with any external treatments. The IAT researcher rates various dimensions of a subject’s drawings such as clarity of imagery, imagery of disease, imagery of healing forces, imagery of treatment, and symbolism of imagery. The resulting scores are used to evaluate and identify strengths and weaknesses represented in a subject’s imagery, and to understand a person’s response to the disease.

Reliability coefficients for Image-CA range from .60 to .95, established through interdimensional and inter-rater correlations. Normative studies established statistically significant concurrent validity ratings between the Image-CA and patient health status.

For the Image-SP, reliability estimates for the two scoring systems, based on inter-rater agreement and consistency, were .85 and .97, respectively. Validity was established through statistically significant comparison with Minnesota Multiphasic Personality Inventory scores, physician global outcome ratings, and prediction of responsiveness to treatment interventions such as spinal fusion, facet interventions, and a spinal pain rehabilitation program.
Reliability and validity coefficients obtained for the Image-DB were based on a sample of 72 cases. Inter-rater reliabilities of .82 and .94, respectively, were obtained. Internal reliability yielded a coefficient of .97 (alpha). Image-DB scores were found to correlate significantly with blood glucose levels in a study of 45 outpatient, insulin-dependent diabetics.

Inter-rater reliability of IAT responses in the present study was established by correlating the ratings of the researcher with those of two independent healthcare professionals who had no contact with or knowledge of the subjects in the study. Independent raters scored the initial drawings of the treatment group subjects based on an appraisal of the drawings, along with consideration of the interview data that had been obtained by the researcher. Inter-rater reliability (mean) was measured at .76 for the total score. In delineating the various elements of imagery that are important (eg, symbolism, power of internal healing resources), the IAT is consistent with a theoretical view of imagery as it relates to disease, thus establishing construct validity.

The following hypotheses were developed:

1. Subjects in the imagery group will report significantly less emotional distress at the conclusion of the study than will subjects in the control group, as measured by the POMS and the STAI.

2. Subjects in the imagery group will experience an increase in attributions reflecting an internal control of health relative to the control group, as measured by the HAT.

3. Subjects in the imagery group will experience positive changes in their illness imagery (eg, increased clarity, increase in imaged perceptions of favorably altering the disease, increased power of internal healing forces) resulting from feedback obtained during the study, as measured by the IAT.

4. Subjects in the imagery group will report a significant decrease in MS symptoms from pre- to posttest, in comparison with the control group, as measured by the MS Symptom Checklist.

RESULTS

To examine emotional distress, as measured by the POMS and the STAI, two separate series of repeated-measures analysis of variance (ANOVA) were conducted. The first ANOVA series used the POMS subtest scores as the dependent variable, and the type of group (imagery vs control) and pre- to posttreatment as independent variables. The second ANOVA series differed only in the use of the STAI subtest scores as the dependent measure.

No statistically significant differences were found between groups for POMS subtest scores, suggesting little difference between the treatment and control groups in tension, depression, anger, vigor, fatigue, or concentration. However, the second ANOVA series yielded significant results in the area of state anxiety, reflecting a decrease in state anxiety over time in the treatment group versus the control group ($F_{1,31} = 5.53; P < .05$) (Table 1). No significant differences between groups for trait anxiety, as measured by the STAI, were found.

<table>
<thead>
<tr>
<th>Group</th>
<th>Pretest M</th>
<th>Pretest SD</th>
<th>Posttest M</th>
<th>Posttest SD</th>
<th>F (1,31)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Imagery</td>
<td>57.53</td>
<td>13.40</td>
<td>52.40</td>
<td>12.95</td>
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<td>Trait</td>
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<td>55.60</td>
<td>13.65</td>
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<td>Control</td>
<td>54.83</td>
<td>10.79</td>
<td>56.33</td>
<td>11.78</td>
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<tr>
<td>Trait</td>
<td>58.06</td>
<td>15.60</td>
<td>56.83</td>
<td>17.19</td>
<td></td>
</tr>
</tbody>
</table>

* $P < .05$

To examine the hypothesis that subjects in the imagery group would experience an increase in attributions reflecting an internal control of health relative to the control group, as measured by the HAT, a repeated-measures ANOVA was conducted using HAT subscale scores as the dependent variable and the type of group (imagery vs control) and pre- to posttreatment as independent variables. Of the three subscales, only the “internal control of health” scale showed statistically significant results. The imagery group remained relatively stable across time, whereas the “internal control of health” scores for the control group decreased over time ($F_{1,31} = 4.88; P < .05$) (Table 2).

To examine the hypothesis that subjects in the imagery group would experience an alteration in their illness imagery because of feedback obtained during the study, as measured by the IAT, a t test for dependent measures was conducted comparing pretest and posttest scores for the imagery group, which yielded a significant positive result ($t = 3.58; P < .001$) (Table 3).

To examine the hypothesis that subjects in the imagery

<table>
<thead>
<tr>
<th>Group</th>
<th>Pretest M</th>
<th>Pretest SD</th>
<th>Posttest M</th>
<th>Posttest SD</th>
<th>F (1,31)</th>
</tr>
</thead>
<tbody>
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<td>Imagery</td>
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<td>1.53</td>
<td>6.07</td>
<td>2.09</td>
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<td>.07</td>
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<td>CHAN</td>
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<td>5.80</td>
<td>1.78</td>
<td>.02</td>
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<tr>
<td>Control</td>
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<td>POS</td>
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<td>2.17</td>
<td>4.22</td>
<td>2.80</td>
<td></td>
</tr>
<tr>
<td>CHAN</td>
<td>5.33</td>
<td>2.17</td>
<td>5.56</td>
<td>2.45</td>
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</tr>
</tbody>
</table>

* $P < .05$

INT, Internal scale; POS, Powerful Others scale; CHAN, Chance scale.
TABLE 3 Imagery Assessment Tool individual mean scores, standard deviations, and \( t \) values by measure

<table>
<thead>
<tr>
<th></th>
<th>Mean</th>
<th>Standard Deviation</th>
<th>( t )</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pretest</td>
<td>2.80</td>
<td>.9444</td>
<td>3.58*</td>
</tr>
<tr>
<td>Posttest</td>
<td>3.12</td>
<td>.8047</td>
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</tbody>
</table>

* \( p<.001 \)

Group would report a decrease in MS symptoms from pre- to posttest in comparison with the control group, as measured by the MS Symptom Checklist, a \( t \) test for independent groups was conducted using pretest to posttest change scores (Table 4). No significant differences were found between the two groups with regard to decrease in MS symptoms across time.

DISCUSSION

The results of this study indicate that MS patients who participated in the imagery group process were less anxious at the conclusion of the study than were those who did not. However, the results do not reflect any significant changes in other mood variables including tension, anger, depression, vigor, fatigue, or concentration.

Perhaps the most surprising of the “nonsignificant” mood variables is that of depression; other studies have found significant reductions in depressed mood for treatment groups.13, 14 Whereas the POMS has been shown to correlate .61 with the BDI, which was used in these studies and often is administered in research and clinical settings,15 a substantial percentage of the variance—approximately 63%—is not explained by the correlation between the two measures. The BDI may be more sensitive to certain depressive symptoms than the POMS. It also is presented in a different format than the POMS, offering the subject a choice of four statements for each symptom, in contrast with rating a single adjective descriptor. In future research it might be preferable to include the BDI for use along with, or in place of, other measures assessing depression.

It also was anticipated that the locus of control regarding health status of the imagery group would become more internal over time because those patients practiced an imagery exercise that emphasized an individual’s sense of influence over disease processes. The results suggest that the imagery group maintained approximately the same degree of internal locus of control from the beginning of the study to its conclusion. In addition, little difference between the imagery and the control group was observed in the subscale areas of Powerful Others and Chance, which measure the importance ascribed to external factors. However, on the Internal subscale, the control group shifted to a less internal locus of control through the course of the study, which accounted for the significant change. Such an unanticipated response raised an interesting question: Does not participating in an imagery (or other psychological intervention process) lead to an increasing shift away from an internal locus of control? Perhaps continuing to participate in conventional medical treatment (without being involved in a psychological intervention) that emphasizes reliance on external forces (ie, physician, medication) reinforces such a process, given the weight of importance placed on prescription of medication, power of the physician, and so on. A related consideration is that control group members may become demoralized as a result of not being randomized into a potentially beneficial and meaningful psychosocial treatment intervention. This is an argument that LeShan16 suggested may hold true for cancer patients participating in controlled, experimental trials who are told (as they are in all experimental research to provide for informed consent) that they have been placed in a wait-list group rather than the treatment group. This possibility may have influenced locus of control in the manner described in this study. It also is possible, however, that the control group “change” may simply reflect a statistical anomaly.

It may be unreasonable to expect significant shifts in locus of control over the course of a brief psychological intervention. Locus of control may be viewed as a relatively stable psychological process, one that may change only in the face of significant alteration in perceptions and experiences. Practicing imagery regularly over a longer period of time may be more likely to produce

TABLE 4 Mean posttest score comparison (and standard deviation) of groups by measure with normative samples

<table>
<thead>
<tr>
<th></th>
<th>Norms</th>
<th>Imagery*</th>
<th>Control*</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>M</td>
<td>SD</td>
<td>M</td>
</tr>
<tr>
<td>HAT</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>INT</td>
<td>6.85</td>
<td>5.89</td>
<td>5.89</td>
</tr>
<tr>
<td>POS</td>
<td>-13.90</td>
<td>4.39</td>
<td>4.67</td>
</tr>
<tr>
<td>CHAN</td>
<td>-1.04</td>
<td>5.01</td>
<td>5.67</td>
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<tr>
<td>POMS†</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tension</td>
<td>40.8</td>
<td>7.9</td>
<td>41.94</td>
</tr>
<tr>
<td>Depression</td>
<td>39.0</td>
<td>10.4</td>
<td>41.17</td>
</tr>
<tr>
<td>Anger</td>
<td>45.7</td>
<td>9.3</td>
<td>45.06</td>
</tr>
<tr>
<td>Vigor</td>
<td>58.9</td>
<td>6.7</td>
<td>59.50</td>
</tr>
<tr>
<td>Fatigue</td>
<td>44.4</td>
<td>6.8</td>
<td>50.78</td>
</tr>
<tr>
<td>Confusion</td>
<td>40.3</td>
<td>5.4</td>
<td>40.83</td>
</tr>
<tr>
<td>STAI‡</td>
<td></td>
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<tr>
<td>State</td>
<td>36.30</td>
<td>10.5</td>
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</tr>
<tr>
<td>Trait</td>
<td>36.00</td>
<td>8.7</td>
<td>58.06</td>
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* Imagery and control group means are posttest scores.
† Profile of Mood States mean scores represent female norms.
‡ State-Trait Anxiety Inventory mean scores represent female norms for the 40 to 44 age group.
Effects of Imagery on Attitudes and Moods in Multiple Sclerosis Patients

ALTERNATIVE THERAPIES, SEPTEMBER 1996, VOL. 2, NO. 5

79

such a change. Future research might examine the effects of participation in a longer imagery program, or perhaps could include an extended follow-up after the conclusion of the study. Whereas locus of control is viewed as an important construct to measure in MS research, the findings of the present study are consistent with other research on brief psychological intervention with MS that found no significant change in locus of control due to the brevity of treatment. 5,11

MS subjects in the imagery group demonstrated positive alterations in their illness imagery, which was reflected in their drawings, as a result of feedback obtained from the experimenter following the first imagery drawing session. The subjects’ use of imagery reflected an increased consistency with the physiological mechanisms of MS, and became more symbolic, active, and powerful. This change may reflect definitive changes in the imagery of the subjects; however, it also may, at least in part, represent a desire to please the researcher by altering descriptions of imagery to increase congruence with his feedback.

Whereas it was hypothesized that the imagery group would demonstrate a reduction in MS symptoms over time, this did not occur. The imagery group differed little from the control group in terms of symptoms. It may be that over a short time span there is random fluctuation in symptoms associated with the random MS disease process. The natural course of MS makes it difficult to control for variation in emotional and physical symptoms over a given period of time. The disease is so variable in its presentation that decreases in symptoms in some subjects might be offset by increases in symptoms in others.

The subjects in this study were informed that the use of imagery is an adjunctive procedure, not meant to replace traditional medical treatment. Such a description may not serve to mobilize belief systems reflecting—and, in turn, influencing—potential for physical healing through the use of imagery.

Further examination of the data yields additional information with potential utility for understanding MS patients. Table 4 compares the imagery and control groups’ mean scores on the dependent measures with those of the respective normative samples. Examination of the data indicates that the mean scores for the imagery and control groups on the various measures generally were consistent with one another. In several areas, however, these two groups differed noticeably from the normative samples. On the HAT, imagery and control groups means were not similar to the normative sample on the Powerful Others scale. The mean score for the normative sample on the Powerful Others scale is –13.90, which converts to a Sten score of 5 and is an average score. The MS groups had mean scores of 4.67 and 4.33, which convert to a Sten score of 10, a very high score. Achterberg and Lawlis indicate that individuals who receive such a score on this scale are likely to trust medical professionals implicitly, and “will probably not do well in situations that require independence, self-motivation, and determination.” 6,7 This situation may be a consequence of the relative lack of available information about treatment, and further research should address health attribution status to assess whether the results of this study reflect a possible MS profile.

The final areas in which the mean scores of the MS groups were at variance with the normative samples were those of state and trait anxiety. The normative sample score for state anxiety converts to a standard score of approximately 50, which falls at mid-range. The imagery and control groups’ state anxiety scores, however, convert to standard scores of 67 and 70, both of which are nearly two standard deviations above the mean, thus indicating much higher levels of state anxiety with a similar pattern in the area of trait anxiety. This scoring may be a consequence of the unpredictable course of MS; similar findings have occurred in other research. 7 It also is possible that these higher levels of measured anxiety reflect a response to a core emotional stressor or an underlying character trait causative of MS. A common core emotional stressor has not previously been identified; trait research also has not determined an MS “trait” common to most MS sufferers. 12,18

CONCLUSION

The application of a biologically oriented imagery process exemplifies a therapeutic approach that can assist in reducing anxiety in MS sufferers. The use of imagery drawings allows for positive modification of the therapeutic imagery material to increase its utility and power. Imagery is a brief, cost-effective treatment that creates potential for long-term change through support and mobilization of hope and belief, which themselves can be life-changing and healing.

References