The Use of Alternative Therapies to Lower Blood Pressure in Older African Americans

Cardiovascular (CVD) disease is the leading cause of death in the USA, especially for African Americans, who have higher blood pressures (BPs) than Whites. The prevalence of hypertension continues to grow, resulting in higher health care costs for all. Compliance with treatment is poor because the unpleasant side effects of medications and the necessary lifestyle changes in eating, smoking, and exercise habits are difficult to make. Non-invasive treatments that require less medication, lower cost, and fewer hospitalizations, while increasing enjoyment and feelings of well-being could reduce BPs and lower the death rate for CVD. This project compared short-term and long-term success rates of three non-traditional treatments for hypertension: Biofeedback (BF), Qigong for the Elderly (QGE), and a combination of Meditation/Prayer/Relaxation (MPR) in older African Americans (50+) from the Central Piedmont region of NC. Groups of 7-10 received one of the 3 treatments for 10 wks during 1 hr sessions twice a week. BP and HR data were collected before and after the treatments, and during 3 mo of follow-up. All treatments were effective in decreasing SPBs and DBPs. QGE was most effective, decreasing systolic pressures by an average of 23.5 mmHg and diastolic pressures by 19.4 mmHg. MPR and BF produced smaller but similar differences, with systolic decreases for MPR=13.9 mmHg and BF=15.9 mmHg and diastolic decreases 13.4 and 10.3 mm Hg respectively. Follow-ups at 3 month post treatment indicated that QGE group pressures continued to improve slightly, and MPR and BF pressures remained the same or decreased. Possible reasons for QGE being the most effective will be presented.

• Note: Additional participants increasing groups to a minimum of 15 will be included in the presentation, which may change some of the findings. The social variables surveyed will be discussed in terms which variables might predict success.

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Susan J. Schumacher, Ph.D. and Katherine Wilkerson

Department of Psychology, NC A&T State University Greensboro, NC

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Overall Purposes of Entire Project

• To compare the effectiveness of Qigong for Health in the Elderly (QGE), Meditation/Prayer/Relaxation (MPR), and Biofeedback (BF) to treat hypertension.
• To use these with an older African American population.
• To examine compliance with the treatment requirements during and after therapy.
• To examine blood pressures (BP) during and after therapy.
• To determine if factors such as health, religiosity, or life satisfaction can predict treatment effectiveness or compliance.

Introduction

• Heart disease is the leading cause of death in the United States.

• Hypertension, or high blood pressure, is known as the “silent killer” because there are no symptoms until it becomes severe and life-threatening.

• African Americans develop hypertension and associated diseases more than Caucasians for a variety of reasons.

• Compliance with treatment is poorer in older African Americans.

NHLBI Chartbook and Factbook, 2002
Reasons for Poor Treatment Compliance

- Poor understanding of the benefits of treatment
- Poor understanding of the consequences of non-compliance
- Cost of treatment and proper diet
- No social pressure to comply
- Intangible rewards for compliance
- Troublesome side effects, often worse than disease symptoms

Hypertension Categories Now Include Lower Pressure Standards

<table>
<thead>
<tr>
<th>CATEGORY</th>
<th>Systolic (mmHg)</th>
<th>Diastolic (mmHg)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Normal</td>
<td>&lt;120</td>
<td>&lt;80</td>
</tr>
<tr>
<td>Prehypertensive</td>
<td>120-139</td>
<td>80-89</td>
</tr>
<tr>
<td>Hypertensive</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Stage 1</td>
<td>140-159</td>
<td>90-99</td>
</tr>
<tr>
<td>Stage 2</td>
<td>≥160</td>
<td>≥100</td>
</tr>
</tbody>
</table>

Source: http://www.americanheart.org/presenter.jhtml?identifier=4450
Alternative Approaches to Treatment are Being Considered

• Division of National Institutes of Health for the investigation of alternative therapies (National Center for Complementary and Alternative Medicine = NCCAM).
• Increased interest in Public Health programs
• Popular magazines have devoted special issues to alternative medicine

Alternatives Shown to Work by Some Studies

• Prayer
• Meditation
• Relaxation
• Regulated Breathing
• Exercise
• Yoga
• Qigong (incorporates postures, breathing techniques, and focus)
• Biofeedback
Advantages of These Alternatives

- Fewer unpleasant side effects than from medications
- Lower cost (multiple prescriptions, hospitalizations)
- Less difficult to do than sudden total lifestyle changes of diet, weight loss, smoking and alcohol abstinence
- More enjoyable
- Increased social support network

Research Presented is Part of an Ongoing Clinical Trials Study to

- Report data to date on the effectiveness of QGE, MPR, and BF for lowering BPs in older African Americans.
- Assess their BPs and treatment compliance during and after treatment.
- Propose what factors such as health, stress, and religious participation might predict treatment success.
Hypothesis
We predicted that:
1) After 10 weeks of treatment, all three treatments will lower both systolic and diastolic BPs (SBPs and DBPs) below their beginning baseline levels.
2) QGE and MPR will result in greater BP decreases than BF.
3) MPR would have the best long term compliance as determined by the 3 mo. follow-up measures, frequency of recording BPs, and maintenance of lowered BPs.
4) There may be biopsychosocial factors that can predict better success with alternative therapies.

Method
Participants
• 48 African Americans ages 50 or older with treated or untreated pre-hypertension or hypertension volunteered to participate at area churches or at NC A&T’s Hypertension Center.
• Group composition: MPR=5M/11F; QGE=5M/9F; BF=2M/8F; wait list control (WLC) 4M/4F. Several in each group failed to complete the study, usually due to family illness. Their information is excluded.
• To date, the age categories for each group were from 55-59 thru 85-89.
Participants (continued)

- Group composition was relatively similar, except for the WLC which was more highly educated and younger, possibly associated with their higher incidence of being married. Groups were similar with regard to gender and family history of cardiovascular disease. Frequent failure to complete some of the demographic information resulted in inadequate group descriptions. However, the majority of the findings compare each participant’s progress with his/her initial BPs to monitor improvement.
- Treatments were randomly assigned to groups.

Assessment

- The Duke Activity Status Index
- Duke Health Profile (The DUKE)
- Holmes-Rache Life Changes Scale
- Philadelphia Geriatric Center Moral Scale
- Duke University Religion Index
- CVD Myths*
- General Health Survey*
- Wrist Blood Pressure Monitor with memory
- Procomp/Biograph Encoder Software and laptop computer

* Not validated
Therapies

• A combination of Meditation, Prayer, and Relaxation, with imagery (MPR)
• Qigong, or Chi Kung, for the Elderly, the parent of Tai Chi (QGE)
• Biofeedback using shoulder EMG (BF)

<table>
<thead>
<tr>
<th>TABLE 1. THE RESEARCH PLAN</th>
</tr>
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<tbody>
<tr>
<td>Week</td>
</tr>
<tr>
<td>------</td>
</tr>
<tr>
<td>1-11</td>
</tr>
<tr>
<td>12</td>
</tr>
<tr>
<td>12-23</td>
</tr>
<tr>
<td>24 or 25</td>
</tr>
</tbody>
</table>
Results

• Due to the group sizes and some incomplete information, the data primarily are presented by
  • Graphs
  • Descriptive and nonparametric statistics
  • Paired t-tests and One Way ANOVAs are used when possible

<table>
<thead>
<tr>
<th>Therapy</th>
<th>BP Type</th>
<th>Pre-Treatment</th>
<th>Post-Treatment</th>
<th>Pre-Post Difference</th>
<th>p level</th>
</tr>
</thead>
<tbody>
<tr>
<td>MPR</td>
<td>Systolic</td>
<td>140.87</td>
<td>127</td>
<td>13.87</td>
<td>.016</td>
</tr>
<tr>
<td></td>
<td>Diastolic</td>
<td>85.94</td>
<td>72.57</td>
<td>13.37</td>
<td>.008</td>
</tr>
<tr>
<td>QGE</td>
<td>Systolic</td>
<td>151.43</td>
<td>127.91</td>
<td>23.52</td>
<td>.008</td>
</tr>
<tr>
<td></td>
<td>Diastolic</td>
<td>99.43</td>
<td>80</td>
<td>19.43</td>
<td>.009</td>
</tr>
<tr>
<td>BF</td>
<td>Systolic</td>
<td>138</td>
<td>122.11</td>
<td>15.89</td>
<td>.021</td>
</tr>
<tr>
<td></td>
<td>Diastolic</td>
<td>84.89</td>
<td>74.56</td>
<td>10.33</td>
<td>.035</td>
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</table>
Maintained Improvement at Follow-up

<table>
<thead>
<tr>
<th>Therapy</th>
<th>BP Type</th>
<th>Pre-Treatment</th>
<th>3 month Follow-up</th>
<th>Pre-Follow-up Difference</th>
<th>p level</th>
</tr>
</thead>
<tbody>
<tr>
<td>MPR</td>
<td>Systolic</td>
<td>140.87</td>
<td>127.99</td>
<td>12.88</td>
<td>.000</td>
</tr>
<tr>
<td></td>
<td>Diastolic</td>
<td>85.94</td>
<td>78.97</td>
<td>6.97</td>
<td>.001</td>
</tr>
<tr>
<td>QGE</td>
<td>Systolic</td>
<td>151.43</td>
<td>127.91</td>
<td>23.52</td>
<td>.008</td>
</tr>
<tr>
<td></td>
<td>Diastolic</td>
<td>99.43</td>
<td>74</td>
<td>25.42</td>
<td>.004</td>
</tr>
<tr>
<td>BF</td>
<td>Systolic</td>
<td>138</td>
<td>126.41</td>
<td>11.59</td>
<td>NS</td>
</tr>
<tr>
<td></td>
<td>Diastolic</td>
<td>84.89</td>
<td>76.63</td>
<td>8.26</td>
<td>NS</td>
</tr>
</tbody>
</table>

Summary After 10 Weeks of Treatment

- Overall, participants significantly reduced their SBP and DBP after treatment ($Z=2.9$, $p=.004$; $Z=4.3$, $p<.000$) and after follow-up ($p<.000$)
- Each of the three treatments significantly reduced SBP and DBP from pre to post evaluations (all $p<.05$), with QGE improvement being the most significant ($p<.005$)
Compliance Measures

One Way ANOVAs followed by Tukey HSD tests indicated that, during Follow-up, MPR>QGE (p<.01) and BF>QGE (p<.02) for the number of sessions attended. For the number of BPs taken during Follow-up, MPR>QGE (p<.02).

<table>
<thead>
<tr>
<th></th>
<th>Mean # of follow-up sessions attended</th>
<th>Mean # of BPs taken during follow-up period</th>
</tr>
</thead>
<tbody>
<tr>
<td>MPR</td>
<td>3.46**</td>
<td>51.77</td>
</tr>
<tr>
<td>QGE</td>
<td>1.9</td>
<td>18.7</td>
</tr>
<tr>
<td>BF</td>
<td>3.44*</td>
<td>31.44</td>
</tr>
</tbody>
</table>

*p>.05
** p>.01

Follow-up Summary

- A OneWay ANOVA determined that the number of follow-up sessions differed significantly for the treatment conditions (F=6.6, p=.004). Post Hoc Tukey HSD tests showed the most follow-up sessions for MPR and the fewest for QGE (all p<.02).
- An ANOVA also showed a significant treatment difference in the number of blood pressures recorded (F=4.7, p=.02). Post Hoc Tukey HSD tests revealed that the MPR groups took their pressures significantly more frequently than QGE.
- SBPs and DBPs during follow-up maintained for QGE and MPR participants, even though the QGE group demonstrated the least compliance during follow-up.
Survey Predictions

- A preliminary Principal Component Factor Analysis with Varimax Rotation suggests that there may be at least four factors from the surveys administered that may be good predictors of treatment success. Additional analysis is in progress.

Conclusions

For our preliminary data, we predicted that:

1) After 10 weeks of treatment, all three treatments will lower both systolic and diastolic BPs (SBPs and DBPs) below their beginning baseline levels. Overall, and for each individual treatment, SBPs and DBPs significantly decreased after treatment compared to baseline BPs.

2) QGE and MPR will result in greater BP decreases than BF:

   This was supported, but it was unexpected that QGE would produce the most significant improvement and BF the least.
Conclusion (continued)

3) **MPR would have the best long term compliance as determined by the 3 mo. follow-up measures, frequency of recording BPs, and maintenance of lowered BPs.**

   Although MPR did have the best follow-up compliance for all measures, QGE may be the most effective as a treatment.

4) **There may be biopsychosocial factors that can predict better success with alternative therapies.**

   Analysis for this is still in progress.

Acknowledgements

Thanks for the invaluable aid and support of my co-author, Katherine Wilkerson and my statistical consultant, Dr. Brian Sims.