Physical Activity Mediators and Dietary Habits in Patients at Risk for Peripheral Arterial Disease

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Talk Overview

- What is Peripheral Arterial Disease?
- Literature Review
- Dr. Collins’ walking study
- My survey study
Peripheral Arterial Disease (PAD)

- Obstruction of peripheral arteries
  - Atherosclerosis
  - Inflammatory processes
  - Stenosis
  - Embolism or thrombus formation
Leg Symptoms

- Atypical
- Claudication
  - Pain or cramping in muscles
  - Goes away at rest
- Critical Limb Ischemia
  - Sores, wounds or ulcers
  - Slow to heal
Diagnosis at the Bedside

- Ankle brachial index (ABI)
  - Systolic ankle blood pressure/systolic arm blood pressure
  - <0.90 impairment
Risk Factors

- Smoking
- Diabetes Mellitus
- Hyperlipidemia
- Hypertension
- Age older than 70 years
- African American
Treatment

- Risk Factor Management
  - Smoking cessation
  - Glucose control
  - Blood pressure control
  - Lipid control
- Medication
  - Aspirin
  - Clopidogrel (Plavix)
  - Statins
  - Cilostazol for claudication
- Regular exercise
- Angioplasty
- Stents
Why PAD?

- Walking impairment impacts every day life
- Increased risk for cardiovascular events
- Much of treatment focus is on preventing systemic events
PAD and Exercise

- Patients with higher daily physical activity have reduced mortality and cardiovascular events
  - (Garg et. al Circulation 2006)

- Patients randomized to supervised treadmill walking program showed greater improvement in community walking ability
  - (Pilot Study McDermott et. al. Journal of Cardiopulmonary Rehabilitation 2004)
Unsupervised Walking
(Collins et. al. Annals of Behavioral Medicine, 2007)

- Significant improvement:
  - ABI (P=0.008)

- Stair climbing ability:
  - Intervention group 61.2 ±32.8
  - Control group 40.2 ± 30.2 (p=0.02)

- Readiness to exercise (PACE Score)
  - 4.73 ± 1.3 vs 2.92 ± 1.8 (p=0.04)
PAD and Diabetes

- Patients with PAD and diabetes have poorer lower extremity function than patients with only PAD (Dolan et. al. Diabetes Care 2002)
  - Diabetic neuropathy
  - Greater cardiovascular disease

- Diabetics are less likely to intend to exercise and less likely to actively engage in exercise (Schrop et. al. Journal of Health Care for the Poor and Underserved, 2006)
Self-Managed Walking Improves Function in Patients with Diabetes Mellitus and Peripheral Arterial Disease

- How this study is different
  - Intervention v. observational
  - Self-managed v. scheduled sessions
  - Community walking v. treadmill

- Hypothesis: To determine if self-managed walking therapy results in improved ambulatory function for patients with symptomatic PAD and diabetes mellitus
Assessments

- Initial Telephone Assessment
  - San Diego Claudication Questionnaire
  - Physical Activity Readiness Questionnaire
  - Patient-Centered Assessment and Counseling for Exercise (PACE) protocol
- ABI
- Baseline Visit
  - Treadmill Walking test
  - Questionnaires
    - Lifestyle and Clinical Survey
    - Walking Impairment Questionnaire
    - Medical Outcomes Short Form Survey
    - Self-Efficacy
    - Stanford Exercise Behaviors
    - Geriatric Depression Scale
  - PAD Video
Randomization

**Intervention**
- Self Managed Program
  - one on one: walking behaviors
  - Reinforcement: 2 walking training sessions
  - Group: weekly community walking sessions
- Bi-weekly Phone Calls
  - Risk Factor Control
  - Exercise Frequency
  - PACE score
  - Walking Behaviors

**Control**
- Bi-weekly Phone Calls
  - Risk Factor Control
  - Exercise Frequency
3 month and 6 month Follow up Visits

- ABI
- Treadmill Walking Test
- Questionnaires
  - Walking Impairment Questionnaire
  - Medical Outcomes Short Form Survey
  - Self-Efficacy
  - Stanford Exercise Behaviors
  - Geriatric Depression Scale
Exclusion Criteria

- Poorly controlled diabetes
  - Hgb A1c > 9.5

- Limited ability to complete exercise protocol
  - Major amputation, vascular surgery planned ect.

- Absence of Leg Symptoms

- Limited exercise tolerance
  - Severe arthritis, dizziness, angina ect.

- PACE score of 1
  - Patients who do not intend to start exercising in the next 6 months
Progress

- 621 participants assessed via telephone
- 127 eligible
- 32 randomized
- 2 completed 6 month follow ups
Physical Activity Mediators and Dietary Habits in Patients at Risk for PAD
PAD and Nutrition

- High consumption of fiber containing foods associated with greater mean ABI in males


- Positive clinical effects of fish oil, carnitine and vitamin E (Carrero and Grimble British Journal of Nutrition, 2006)
Physical Activity Determinants and Mediators

I'm not sure if it's safe for you to walk to school—you might meet the kinds of people who walk.
Physical Activity Determinants and Mediators

- **Barriers**
  - Time Constraints
    - (leading reason, Strutts, AAOHN Journal, 2002)
  - Lack of motivation
  - Boredom
  - Lack of facilities or access to equipment
  - Cost
  - Weather
  - Lack of encouragement or social support

- **Incentives**
  - Dissatisfaction with weight and appearance
    - (leading reason, Strutts, AAOHN Journal, 2002)
  - Habit
  - Decrease stress
  - Improve health
  - Told by physician
  - Job requirements
  - Exercise pet
  - Spend time with children
Study Methods

- Excluded Patients – consented to be contacted for future research

- Assess exercise mediators and nutritional habits via telephone or mailed surveys

- Compare participants with a PACE score of 1, who do not intend to exercise, to participants with a higher PACE score
Assessments

- Lots of Phone Calls!!
- Demographic information
- PACE Physical Activity Status
- PACE Nutritional Assessment Form
- 6 Physical Activity Questionnaires
PACE Physical Activity

- 8 item survey
- 3 stages of readiness to change
  - Pre-contemplation = 1
    - Not physically active and no intention to exercise in the next 6 months
  - Contemplation = 2-4
    - Intentions to begin physical activity or not active on a regular basis
  - Active = 5-8
    - Currently physically active
PACE in Research

- Physically Active for Life Project
  - “Feasible” intervention for physicians that improved satisfaction of care (Pinto et. Al. Annals of Behavioral Medicine, 2001)

- PACE protocol produces short term increases in physical activity outcomes (Calfas et. al. Preventive Medicine, 1996)
PACE Nutrition

- 4 item surveys
  - Pre-contemplation, Contemplation, Active
- Fruit and Vegetable Intake
- Dietary Fat Intake
- Calorie Intake and Weight Management
Physical Activity Questionnaires

1. Processes of Change – cognitive and behavioral processes
   - Increasing Knowledge
   - Being aware of risks
   - Caring about consequences to others
   - Comprehending benefits
   - Increasing healthy opportunities
   - Substituting alternatives
   - Enlisting social support
   - Rewarding oneself
   - Committing oneself
   - Reminding oneself

2. Confidence (Self-Efficacy)
3. Decisional Balance – benefits and barriers
4. Social Support
5. Outcome Expectations for Exercise – beliefs
6. Physical Activity Enjoyment Scale
**Physical Activity Questionnaires**

**QUESTIONNAIRE 5.1**

Processes of Change

Physical activity or exercise includes activities such as walking briskly, jogging, bicycling, swimming, or any other activity in which the exertion is at least as intense as these activities.

The following experiences can affect the exercise habits of some people. Think of any similar experiences you may currently have or have had during the past month. Then rate how frequently the event occurs. Please circle the number that best describes your answer for each experience.

**How frequently does this occur?**

1 = never
2 = seldom
3 = occasionally
4 = often
5 = repeatedly

1. Instead of remaining inactive I engage in some physical activity. 1 2 3 4 5
2. I tell myself I am able to be physically active if I want to. 1 2 3 4 5
3. I put things around my home to remind me to be physically active. 1 2 3 4 5

**QUESTIONNAIRE 5.4**

Social Support for Physical Activity Scale

The following questions refer to social support for your physical activity.

The following is a list of things people might do or say to someone who is trying to do physical activity regularly. Please read and answer every question. If you are not physically active, then some of the questions may not apply to you.

Please rate each question two times. Under “Family,” rate how often anyone living in your household has said or done what is described during the past three months. Under “Friends,” rate how often your friends, acquaintances, or co-workers have said or done what is described during the past three months.

Please write one number from the following rating scale in each space:

1 = none
2 = rarely
3 = a few times
4 = often
5 = very often
0 = does not apply

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<th>Question</th>
<th>Family</th>
<th>Friends</th>
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<td>1. Did physical activities with me.</td>
<td></td>
<td></td>
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<tr>
<td>2. Offered to do physical activities with me.</td>
<td></td>
<td></td>
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<tr>
<td>3. Gave me helpful reminders to be physically active (i.e., “Are you going to do your activity tonight?”)</td>
<td></td>
<td></td>
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Physical Activity Questionnaires in Research

- Physical Activity for Life Project
  - Intervention had a significant impact on processes of change (Pinto et. al Annals of Behavioral Medicine, 2001)

- Processes of Change used in exercise intervention (Marcus et. Al. American Journal of Health Promotion, 1992)

- Decisional Balance Questionnaire significantly associated with exercise adoption stage (Marcus et. al. Health Psychology, 1992)
Participants

- N = 37
- Gender
  - 19 Male
  - 18 Female
# Nutrition Results

## Fruits and Vegetables

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<th>3</th>
<th>4</th>
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<td>1</td>
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## Dietary Fat

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<th>4</th>
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## Calorie Intake

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<td>2</td>
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<tr>
<td>5, 6</td>
<td>0</td>
<td>0</td>
<td>6</td>
<td>10</td>
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Processes of Change Results

Significant Results:
- Substituting Alternatives
- Committing oneself

Questionnaire Scores:
- Increasing knowledge
- Being aware of risks
- Caring about consequences
- Comprehending benefits
- Increasing healthy opportunities
- Substituting alternatives
- Enlisting social support
- Rewarding oneself
- Committing oneself
- Reminding oneself

Pace Scores

1.5
2
2.5
3
3.5
4

1 2, 3, 4, 5, 6
Decisional Balance

-0.5
0
0.5
1
1.5
2
1 2, 3, 4 5, 6

PACE Score

Questionnaire Score

Decisional Balance
Significant Results

- Processes of Change
  - Substituting Alternatives
    - Both PACE 1 and PACE 2-4 groups significantly different than PACE 5-6 (p=0.007)
  - Committing oneself
    - PACE 1 group significantly different from PACE 5-6 (p=0.044)

- Decisional Balance
  - All groups significantly different (p=0.004)

- Outcome Expectations for Exercise
  - PACE 1 group significantly different from PACE 2-6 (p=0.034)
Difficulties

- **Subject Bias**
  - Only 2 out of 37 participants with PACE score of 1

- **Time Constraints**
  - 25-35 minutes to complete telephone surveys

- **Mailings – self administered**
  - Participants forget pages, leave questions blank and/or write in their own answer
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  - Emily Parker PhD
Sources (pictures)

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- Wikipedia
- Dr. Tracie Collins
- OCR Accelerate newsletter September 2006 ([www.ahc.umn.edu/ocr](www.ahc.umn.edu/ocr))
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- The Age ([www.theage.com](www.theage.com))