DECLARATION OF CONFLICT OF INTEREST

None declared
Don’t Worry, Be Happy

Is Laughter Indeed the Best Medicine?

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PSYCHOLOGICAL STRESS AND FATAL HEART ATTACK: THE ATHENS (1981) EARTHQUAKE NATURAL EXPERIMENT

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Effects of Mental Stress on Regional Myocardial Uptake
If mental stress triggers coronary events, do patients with CHD respond differently than age-matched controls to various situations in daily life?
Situational Humor Questionnaire:
300 men and women
(150 with CHD and 150 controls)

You thought you recognized a friend in a crowded room. You attracted the person's attention and hurried over to him or her, but when you got there you discovered you had made a mistake and the person was a total stranger...

1. I wouldn't have found it particularly amusing.
2. I would have been amused but wouldn't have shown it outwardly.
3. I would have smiled.
4. I would have laughed.
5. I would have laughed heartily.
If you arrived at a party and found that someone else was wearing a piece of clothing identical to yours...

1. I wouldn't have found it particularly amusing.
2. I would have been amused but wouldn't have shown it outwardly.
3. I would have smiled.
4. I would have laughed.
5. I would have laughed heartily.

CHD subjects: 40% less likely to respond favorably to situational humor (and more likely to score high on the Cook-Medley Hostility score) compared with age, sex matched controls.
Endothelial Dysfunction Leads to Imbalance of Factors, Resulting in Vascular Disease

Normal Endothelium

- Vascular Tone
- Retard Platelet & Leukocyte Adhesion
- Inhibit SMC Migration/Proliferation
- Barrier to LDL-C
- Degrade VLDL-C & Chylotriglyceride (lipase)

Abnormal Endothelium

- LDL-C
- HTN
- Diabetes
- Smoking
- AII
- IGF1

- Dysfunction
- Vasoconstriction
- ↑ Platelet/Leukocyte Adhesion
- SMC Migration & Proliferation
- Lipid Deposition
- ↓ Clearance

Brachial flow-mediated dilation (FMD) can be measured by vascular ultrasound.
Brachial Artery Flow-Mediated Vasodilation

Baseline 5 Minutes Post-Occlusion

Blood Pressure Cuff Occlusion – 1 Minute Release

3.1 mm 3.6 mm
Factors Impairing Endothelial Function

- Cardiovascular Disease
- Increased Age
- Male Sex
- Family History
- High LDL-cholesterol
- Small-dense LDL
- Oxidized LDL
- Lipoprotein(a)
- Low HDL-cholesterol
- Smoking
- Hypertension
- Diabetes Mellitus
- Obesity
- High-fat Meal
- Inactivity
- Hyperhomocysteinemia
- Mental Stress
Comparison of Brachial and Coronary Flow-Mediated Vasodilation
Prognostic Value of Brachial Artery Flow-Mediated Vasodilation for Predicting CVE’s in 480 Patients with Suspected Coronary Artery Disease
Does Laughing Influence Vascular Function as Assessed by BART?

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Examples of Movies Shown to Promote Laughter
A Example of a Stressful Movie

saving private ryan
Results

- Baseline: 8.8 ± 2.8
- Laughter: 11.4 ± 3.5
- Baseline: 7.7 ± 3.5

P = 0.0001

P = 0.017
Reactive hyperemia phases in one individual after watching a humorous movie and a stressful movie
BART Studies: Summary

- 300+ arterial measurements:

- Emotional Laughter: ↑ FMD similar magnitude as aerobic exercise and statin initiation

- Mental Stress: ↓ FMD as does anger recall and mental arithmetic

- Change in brachial artery FMD exceeded 2.5% absolute difference between groups

Pulse wave velocity, augmentation index & augmented pressure responses

Each line represents response defined as net laughter/stress effect minus sham procedure effect at each time point. p Values refer to the response of laughter/mental stress compared with sham procedure during the whole study duration.

Error bars depict SEM

Proposed Signaling Pathway Underlying Laughter and Vascular Function

Summary

- Laughter improves endothelial vasoreactivity (+/- arterial compliance)

- Signaling Pathways Involved in Hypothalamic mediated activation of Vascular Endothelium

- Further research needed to determine the impact of laughter on CVD outcomes