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Effects of Estrogen on Cardiovascular Health
Women and Cardiac Rehab
Welcome to the Cardiovascular News of Excellence for 2008.

This issue targets women’s heart disease—one of the largest public health problems we face in the U.S. and worldwide. It coincides with the national American Heart Association’s Go Red for Women program in February. In his scarlet homage to Botticelli’s classic painting (cover), Michael Konomos evokes the image of modern women rising above the scourge of heart disease, with the support of their healthcare team.

In this issue, a new member of our faculty, Dr. Mindy Gentry, discusses the risks of heart disease in women, and the steps that they may take to reduce their risk. One of the key preventive measures is exercise, and Steve Galles provides insights into how cardiac rehabilitation, through structured exercise and other risk reduction programs, reduces the risk of heart disease recurrence in individuals who have had a heart attack, bypass surgery, angioplasty or stent.

As women approach menopause, they face choices about the use of estrogens. Dr. Richard White highlights research from his MCG team into the potential enigmatic effects of estrogen on cardiovascular health and disease. Dr. Molly Szerlip addresses a patient question about the safety of estrogen for women entering menopause.

As always we welcome your suggestions and cardiovascular questions. Please contact us at cvnews@mcg.edu.

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Recognition

We congratulate: Dr. Robert Sorrentino, Electrophysiologist, one of “America’s Top Doctors” for 2007-2008; Dr. Uzoma Ibebuogu, American Medical Association Foundation Seed Grant recipient; Dr. Roque Arteaga, First Prize Winner- Clinical Research, Poster Presentation Georgia Chapter of American College of Cardiology; Dr. Dinesh Patel, finalist for the American Heart Association YCI Melvin Judkins Award; Dr. Molly Szerlip received the Women in Cardiology Trainee Award for Excellence at the national meeting of the American Heart Association in 2007; Dr. Irina Sazonova recipient of a Scientist Development Grant from the American Heart Association.

New Team Members

We welcome Dr. Vishal Arora who has returned to MCG after training in vascular interventions (coronaries, peripheral and neurovascular) at University of Virginia and Sequoia Hospital in California. He will partner with Dr. Gautam Agarwal and Dr. Deepak Kapoor in providing cutting edge treatment for vascular disease (more about that in a coming issue).
Ways to reduce the risk of Cardiovascular Disease:

1. Educate yourself. Learn about the risk factors and your family history.
2. If you have diabetes, keep your blood sugar under control.
3. Stop smoking.
4. Have a physician check your blood pressure on a regular basis.
5. Have your cholesterol checked every five years.
6. Moderate exercise for at least 30 minutes, five times per week.
Women and Cardiac Rehab

Women today lead extremely busy lives with commitments to work, family, and community. Many are also caregivers, and as such, have become accustomed to meeting everyone else's needs before their own. Because of this, women may not know where to turn for support after a heart attack or major cardiac procedure. The reality is that millions of women affected by heart disease are also the primary person taking care of a family member with a cardiac condition. This can be very scary and stressful. What women need to know is that they can feel healthy, strong, and safe again.

The MCG Cardiovascular Center is pleased to announce the new Cardiac Rehabilitation program. Cardiac Rehab is a service to help support both women and men who have just had a major cardiac event or intervention. The primary goal is to aid in the healing and recovery process after being discharged from the hospital so patients can return to the same or better quality of life they possessed before hospital admission. Cardiac Rehab is a customized program of exercise and education designed to strengthen the body and reduce the risk of future heart problems.

The Wonder Drug

Cardiac Rehab is especially important for women because women are on average 10 years older than men when first diagnosed with coronary heart disease. Women often face more difficulties with symptoms, physical function, and making appropriate lifestyle changes during recovery. Many women report that they have more pain and fatigue due to their rapid return to physically demanding household tasks and other responsibilities.

If there ever was a wonder drug, then exercise is it. Participating in regular physical activity has many health benefits. Exercise:

- Reduces risk of heart attack
- Lowers LDL “bad” cholesterol.
- Raises HDL “good” cholesterol.
- Helps diabetics optimize blood sugars
- Aids in prevention of osteoporosis
- Some evidence of lowering risk for breast cancer
- Decreases anxiety and depression
- Enhances performance of work, household and recreational activities

At MCG, we also keep in mind our “patient- and family-centered care” philosophy. Regardless of whether a woman is the patient or the caregiver, MCG strongly encourages active participation of family members during the Cardiac Rehab program. Spouses are even offered the chance to work out along side the Cardiac Rehab patient and participate in the educational component.

Comprehensive Care

This brings up an important point: Cardiac Rehab is not just an exercise program. Instruction regarding risk factors, medications, and healthy eating behaviors are integral components of the service. The staff strives to tailor the program to meet the needs of the patients. There is often not enough time to address all the health-related needs during a short physician office visit. This is where the Cardiac Rehab staff helps with the disease management process. Because we see each patient 2-3 times per week for 8-12 weeks, we have plenty of time to instruct patients regarding how to make healthier choices in their everyday life.

Unfortunately, only 15-30% of eligible patients enroll in a Cardiac Rehab program, and women's rates are 10-40% below men's. So there are many patients missing out on this great opportunity for information and support. In March of 2006, Medicare and most other insurances began covering patients after angioplasty, stent placement, valve repair/replacement, as well as heart transplant patients. This is in addition to the coverage for women and men who have had heart attacks, bypass surgery, or have been diagnosed with chronic stable angina.

For more information, feel free to contact the MCG Cardiac Rehab team at (706) 721-9055. We look forward to working with you and your patients.
Estrogen Controversy

For a number of years, estrogen, in the form of hormone replacement therapy (HRT), was a highly prescribed regimen for treating the complications of menopause. The popularity of HRT was due to the ability of estrogen to reverse and/or prevent menopausal complaints (e.g., hot flushes, osteoporosis) and also the belief that estrogens might protect against cardiovascular disease. In fact, most observational studies suggested that HRT was associated with a 50% lower risk of cardiovascular disease. Although there were concerns regarding HRT and cancer, the apparent protection against cardiovascular disease seemed to far outweigh such concerns. About five years ago, however, large-scale clinical trials (such as the Women’s Health Initiative or WHI) reported that HRT actually increased the risk of coronary heart disease and stroke in postmenopausal women.

Since that time, the number of women taking HRT has declined dramatically, and understanding how estrogen affects cardiovascular health has become an important topic in cardiovascular medicine. How could a hormone that lowers LDL, tends to reduce atherosclerotic plaque, inhibits platelet aggregation, and lowers blood pressure increase cardiovascular risk? In other words, why does a seemingly “good” hormone do such bad things to the heart and blood vessels?

Dr. Jekyll and Mrs. Hyde

We recently discovered a “Jekyll and Hyde” effect of estrogen: estrogen can either dilate or constrict coronary arteries, depending on experimental conditions. Many, if not most, beneficial vascular effects of estrogen appear to be mediated via nitric oxide (NO), which is generated by nitric oxide synthase (NOS), which has positive effects on the cardiovascular system including vasodilation of the arteries. With aging and menopause (2) BH₄ and L-Arginine are lacking. In this setting, estrogen (from HRT) stimulates NOS to produce superoxide ($O_2^-$) which may have a detrimental effect on the cardiovascular system including vasoconstriction.

Estrogen: Estrogen has different effects in young and older women. In youth, before menopause (1) the body maintains a sufficient amount of important cofactors BH₄ and L-Arginine (purple and orange trucks). Estrogen stimulates the production of NO by nitric oxide synthase (NOS), which has positive effects on the cardiovascular system including vasodilation of the arteries. With aging and menopause (2) BH₄ and L-Arginine are lacking. In this setting, estrogen (from HRT) stimulates NOS to produce superoxide ($O_2^-$) which may have a detrimental effect on the cardiovascular system including vasoconstriction.
“I am beginning menopause and I wonder if it is safe for me to start estrogen therapy?”

This is an important question that is often asked in my practice as well as practices across the country. At one time, physicians were prescribing hormone replacement therapy (HRT) for both post menopausal symptoms and for the prevention of heart disease in women. The use of estrogen for cardiovascular protection was based on a large observational study that showed women who were taking HRT had a decreased incidence of cardiovascular events. More recently, however, a large randomized controlled clinical trial was performed which examined the role of estrogen alone or the combination of estrogen and progestin in both the primary and secondary prevention of cardiovascular disease. The results of this study showed that the risks of the replacement therapy (increased risk of stroke and breast cancer) outweighed the benefit. At the present time, the American College of Cardiology and the American Heart Association do not recommend hormone therapy or selective estrogen-receptor modulators for the primary or secondary prevention of cardiovascular disease. There are ongoing randomized clinical trials looking at lower doses of these medicines to protect women against cardiovascular disease. We are looking forward to those results. If you experience symptoms related to menopause, I would advise that you speak with your doctor about HRT and other therapies.