



CARDIOVASCULAR DISEASE IN WOMEN – WHY THEY ARE UNIQUE

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1. Hormone Differences

Coronary artery disease (also known as hardening of the arteries of the heart) is the most common cardiovascular disease in advanced society. Men have a higher incidence of heart disease than women, but five to 10 years after menopause, women's cardiovascular death rate equals or exceeds that of men. Presumably the hormonal status (higher estrogen and progesterone levels) offers vascular protection through a yet unrecognized mechanism. Confusion reigns and no coherent therapeutic regimen is widely accepted to either prevent heart disease or treat it after it begins. Efforts to continue this hormonal protection by estrogen, progesterone, and combination regimens for post menopausal woman have produced

conflicting results in major cardiovascular experimental trials. No consensus regarding hormonal replacement to prevent cardiovascular disease has emerged. Cardiovascular disease is a major cause of death in woman and exceeds that of all forms of cancer and other diseases.

2. Early Identification

Identification of coronary atherosclerosis before it is severe enough to cause death or symptoms is an important step in disease prevention. Artery narrowing severe enough to cause symptoms, death, or an abnormal stress test requires cholesterol deposits (or plaques) which obstruct coronary arterial flow. Plaques in their early stages can be identified by a relatively new technique of "calcium scoring".

This technique involves concentrated x-ray beams in a computerized tomographic manner (also known as a chest CT). Identification of any calcium deposits in the heart arteries identifies higher risk patients since calcium is always associated with cholesterol deposits. This identifies such patients long before abnormal stress tests or symptoms appear and permits early cholesterol therapy when appropriate. If therapy is aggressive enough it can cause shrinkage or removal of cholesterol plaques from within the artery.

3. Good Cholesterol (HDL) Is Not Always Protective

Cholesterol is a fat molecule which is a major constituent of artery plaque and thus is the

chemical we need to reduce to prevent or treat heart disease. Cholesterol is not soluble in blood. Visualize drops of oil floating on a water surface and you can understand that cholesterol alone can not pass through the blood vessels. To be carried throughout the body, cholesterol must be attached to protein molecules which make it soluble within the water. Two major types of these molecules exist and they dictate the future destiny of the attached cholesterol. High density lipoprotein (known as HDL) carries cholesterol to the liver and removes cholesterol from the body and is associated with reduced heart disease. Low density lipoprotein (known as LDL) carries cholesterol into arterial plaque and is associated with an increased amount of cardiovascular events. Women usually have higher HDL levels than men. This is especially true when they are premenopausal. It previously was presumed that high HDL levels convey protection even when LDL levels were excessive; however, modern diagnostic techniques, especially the use of calcium scoring, now shows this is not always the case and thus can permit proper risk assessment. In these high risk patients, treatment is focused entirely on reducing LDL cholesterol, ignoring HDL values.

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3. Congestive Heart Failure

Testosterone is a major sex hormone found in males and mediates a large variety of body functions. It also has a major role in women, especially those with weak heart muscle and the clinical syndrome of congestive heart failure. The Stern Cardiovascular Center is now conducting a clinical trial known as CORDELIA. This trial evaluated post menopausal women with congestive heart failure and uses testosterone patches to increase their hormone levels. Preliminary data has shown that this can cause significant improvement in muscle mass and exercise performance.

4. Stress Cardiomyopathy

Cardiologists in Japan 15 years ago described a new type of heart attack. It was much more common in women than men and was characterized by sudden weakness in large areas of heart muscle which caused congestive heart failure. However, this was not associated with a major artery blockage. Often, the weakness in muscle completely resolved within a few days and responded to conventional medicines used to treat heart muscle weakness. Acute emotional stress was often the only identifiable precipitating factor. This syndrome is now more frequently recognized

throughout the world.

SUMMARY:

Cardiovascular disease and diagnosis in women provides unique challenges to us all. Understanding those differences helps to provide insight into the fundamental molecular mechanism of Cardiovascular disease.



About The Author

Frank A. McGrew III, M.D. FACC is board certified in internal medicine and cardiovascular disease. He received his undergraduate degree from Johns Hopkins University and was a member of Phi Beta Kappa. His medical degree was received at Case Western Reserve University where he was in Alpha Omega Alpha. He was a Scientific Project Officer at the National Heart, Lung, and Blood Institute in Bethesda, Maryland and completed his residency in cardiovascular disease fellowship at Duke University in Durham, North Carolina. While there he was Medical Director of the Physician's Associate Program and recipient of the North Carolina Heart Association Research Grant. At the Stern Cardiovascular Center, he is Director of Cardiovascular Research. He's the former governor of the American College of Cardiology for Tennessee and a member of the Joint Civilian Orientation Committee of the Department of Defense. He's been the recipient of the "Top Physicians in America" award and is a clinical cardiologist whose interests range from acute coronary syndrome, congestive heart failure, and atrial fibrillation and cardiac pacemakers. Current congestive heart failure research interests revolve around stem cells for cardiac failure, as well as medications and devices for this and other conditions. Dr. McGrew can be contacted at 901-271-1000