

Stroke in Women

Second leading cause of death by Neelum T. Aggarwal, MD, and Shyam Prabhakaran, MD

O**N AVERAGE**, every 40 seconds someone in the U.S. has a stroke, the nation's leading cause of disability and the fourth leading cause of death. In women, stroke is the second leading cause of death, with 425,000 women suffering from stroke each year, 55,000 more than men. Not only is the overall stroke rate higher for women than for men, women are more likely to have more disability and poorer outcomes than men.

Women's Symptoms More Atypical

What are the possible reasons to explain this observation? One study showed that women may experience longer delay from arrival to emergency rooms to the time they are evaluated for stroke symptoms. The delay may be due to possible gender differences in the reporting of acute stroke symptoms. In a study of 1,189 admissions that ended with a confirmed stroke diagnosis in the emergency room, traditional stroke symptoms of postural imbalance (men 20% vs. 15% in women) and hemiparesis (men 24% vs. 19% in women) were more likely to be the presenting symptoms for men than for women. In addition, women were more likely to present with symptoms that were more atypical for stroke, including pain, and

change in cognition or level of consciousness.


Another possible reason centers around the type of medical treatment given after the diagnosis of stroke is made. Studies have shown that once a diagnosis of stroke has been made, the type of treatment given to women and men differ. In fact, the gender differences in management of stroke appear to be similar to the well-documented gender differences noted in the treatment of cardiac disease; where women are less likely to receive major diagnostic and therapeutic procedures. Differences may also exist in medical treatment for stroke prevention. Men with stroke are more likely to have significant co-morbidities, such as higher rates of ischemia, heart disease, and diabetes compared to women, who have higher rates of hypertension and atrial fibrillation. This cardiovascular medical history profile noted in men may result in more aggressive preventative treatment in men than in women.

Carotid Disease More Common in Men

Aspirin and warfarin are equally effective medications for stroke prevention in men and women. Carotid endarterectomy (CEA) is another important treatment for the primary and secondary prevention of stroke in patients with significant carotid stenosis. Although carotid disease is more common in men than women, some studies have shown a higher rate of post-operative complications in women, such as post-operative stroke. Other studies have found no differences in morbidity and mortality. Commonly cited complication rates in women have been old age at time of presentation for CEA, presence of hypertension, and smaller size carotid arteries.

Hypertension More Common in Women

In stroke and heart disease, the commonly recognized risk factors of smoking, elevated cholesterol, a previous stroke, and large artery atherosclerotic disease, hold true for both men and women. Workup following new stroke should be similar in both sexes. Hypertension and elevated cholesterol are more common in women as they age. Typically, cholesterol levels will increase at the age of 45, presumably due to the onset of menopause. For women who are pre-menopausal, the stroke rate is low except when associated with hormonal contraception. Pregnancy does not appear to increase stroke rates significantly until the last trimester, although pregnancy can complicate pre-existing cerebrovascular disease. Specific differences, though, have been found in some risk factors for women that may predispose them to stroke. One study found that women with stroke had an elevated tissue plasminogen activator antigen, which was an independent risk factor for stroke in non-diabetic women ages 15 to 44 years-old. Other studies have shown that a significant proportion of young women have elevated homocysteine serum levels, an independent risk factor for stroke and vascular disease. Serum homocysteine levels were decreased in women who took daily multivitamins with B6, B12, and folate. Last, oral hormone replacement used by menopausal women may increase the stroke rate.

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Primary Stroke Centers

THE CHICAGO AREA is now home to 22 Primary Stroke Centers that provide state-of-the-art clinical care 24/7 to prevent stroke, minimize disability in stroke survivors, and ensure the best possible outcomes for patients following a stroke. Please refer to this listing of PSCs.

Adventist Hinsdale Hospital	Center
Advocate Christ Medical Center	Mount Sinai Hospital Medical
Advocate Good Samaritan	Center
Hospital	NorthShore University
Advocate Illinois Masonic	HealthSystem
Medical Center	Northwestern Memorial
Advocate Lutheran General	Hospital
Hospital	Our Lady of the Resurrection
Advocate South Suburban	Medical Center
Hospital	Resurrection Medical Center
Advocate Trinity Hospital	Rush University Medical Center
Alexian Brothers Medical	Saint Alexius Medical Center
Center	Saint Francis Hospital
Ingalls Memorial Hospital	Saint Joseph Hospital
John H. Stroger, Jr., Hospital of	Saints Mary and Elizabeth
Cook County	Medical Center
Little Company of Mary	University of Chicago Medical
Hospital	Center
Loyola University Medical	University of Illinois Medical
Center	Center at Chicago
MacNeal Hospital	West Suburban Medical Center
Mercy Hospital and Medical	Westlake Hospital