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Study highlights:

- Stroke is the third leading cause of death and a leading cause of disability; more than 60 percent of all stroke deaths are in women.
- Significant gaps in hospital care and awareness of risk factors exist between men and women with stroke.
- More research is needed to identify specific reasons for these gaps and how to best treat stroke in childbearing women.

American Heart Association themed issue journal report:

Journal issue focuses on growing epidemic of stroke in women

DALLAS, Feb. 10 — Studies on unique stroke risk factors among women and gender disparities in stroke care are featured in a special issue of *Stroke: Journal of the American Heart Association*.

According to an editorial accompanying the special issue, stroke among women is the third leading cause of death, a leading cause of disability and an ongoing epidemic, with women accounting for more than 60 percent of all stroke deaths in the United States.

Publishing such research is timely, said Tobias Kurth, M.D., Sc.D., senior scientist at INSERM Unit 708 – Neuroepidemiology, Paris, France, and associate epidemiologist at Brigham and Women's Hospital in Boston, Mass., and Marie-Germaine Bousser, M.D., head of the Neurology Department of the Hospital Lariboisière in Paris, editorial co-authors, who wrote, “Projections indicate that the prevalence and incidence of stroke will increase by 2020 in both sexes, but that these figures are magnified in women. By 2050, mortality from stroke will be 30 percent higher in women than men.”

They said while the understanding of stroke in women has been substantially improved over the last decades, “Many open questions in the epidemiology, etiology, and outcome of stroke among women remain, however. Substantive efforts by the American Heart Association/American Stroke Association with their Go Red For Women campaign have been started and will continue to improve the awareness of cardiovascular disease and stroke in women and will induce new research efforts.”

“Science and research have been critical components of our Go Red For Women initiative since its inception,” said Lori Mosca, M.D., Go Red For Women spokesperson and director of preventive cardiology at New York-Presbyterian Hospital. “These new research findings showing women have unique risk factors for stroke and are more greatly impacted by the consequences of stroke should be a wake-up call for women to raise their awareness of stroke risk and for healthcare providers to close treatment gaps that can save lives.”

Among studies presented in this special issue:

- Researchers found the overall quality of care for women with ischemic stroke was lower than that for men. They compared the use of seven different treatments that are indicative of excellent evidence-based stroke care in more than 380,000 men and women hospitalized with acute stroke. The treatments included timely use of tPA (clot-busting drug), aspirin (in the hospital and at discharge, which accounts for two treatments), blood thinners (Warfarin), cholesterol treatment, smoking cessation and prevention of blood clots in the legs. These data are from more than 1,100 U.S. hospitals that participated in the American Heart Association/American Stroke Association Get With The Guidelines–Stroke quality improvement program between 2003 and 2008.

“After accounting for baseline differences in age and other health conditions, we found that women were 14 percent less likely to receive perfect care – referred to as defect-free care – compared to men,” said Mathew Reeves, Ph.D., the study’s lead author and associate professor of epidemiology at Michigan State University in East Lansing. “Although the absolute differences were modest, lower quality of care in women was seen in all measures. However, larger, clinically important differences were seen in the proportion of women treated with intravenous tPA and in cholesterol treatment.”

Additionally, the researchers found that after accounting for baseline differences in age and other variables, women had a similar in-hospital death rate following stroke as men, but women were 16 percent less likely to be discharged home following stroke compared to men.

“We found that these sex differences in care cannot be ‘explained away’ based on the obvious gender differences in factors, such as age,” Reeves said. “Future studies should look at aspects of medical care that were not collected in this study; for example, patient or family preference for limitations in care, or physician decisions impacting care delivery.”

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- In an analysis of the Get With The Guidelines–Stroke database in Colorado, researchers found 47 gender differences among 126 elements studied. Compared to men, women in Colorado were older and more significantly impacted by acute stroke. Men had higher incidences of coronary artery disease, high cholesterol, diabetes, carotid stenosis and tobacco smoking, while women had higher incidences of atrial fibrillation and hypertension. Common prevention strategies, such as use of cholesterol-lowering drugs, were less likely to be used in women at risk for stroke than in men. Authors noted overall acute stroke treatment of women appeared “less aggressive” than for men.

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- Researchers analyzing data from the Framingham Heart Study observed 1136 strokes (638 in women) during 56 years of follow-up and found that women were significantly older than men at the time of their first stroke. They also found that women had a higher stroke incidence above 85 years of age, lower incidence than men at all other ages and a higher lifetime risk of stroke at all ages.

While researchers found no significant differences between the genders in stroke subtype, severity and case fatality (or death) rates between genders, women were significantly more disabled prior to stroke and in the acute phase of stroke. At three-to-six months post-stroke, women were more likely than men to be disabled, single and institutionalized.

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- Researchers from Michigan State University found that presenting symptoms did not explain gender differences in emergency department (ED) waiting times for stroke patients. They collected data on 1,922 acute stroke cases at 15 hospitals across Michigan, evaluating the time it took for patients in the ED to be examined by a physician (door-to-doctor time) and the time it took to undergo brain imaging (door-to-image time). They found:

- Women were significantly less likely than men to present with at least one typical stroke warning sign or to be identified as a suspected stroke case.
- Women had 12 percent longer door-to-doctor and 16 percent longer door-to-image intervals than men.

The results did not change after taking into consideration presenting symptoms, age, delayed arrival to the ED and other variables. Researchers concluded that women who had an acute stroke experienced greater ED delays than men, and that these delays were not attributable to gender differences in presenting symptoms, age or other confounders.

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- Researchers at the University of Connecticut asked a group of predominately white, well-educated and high-income women, 50 to 70 years old, who had at least one stroke risk factor, to answer a five-part questionnaire about stroke knowledge, risk perception, risk factors, access to health care and demographics.

- Only two of the 37 (5.7 percent) women with atrial fibrillation and 11 out of the 71 women with heart disease (15.5 percent) identified their health condition as a risk factor for stroke.
- Only 63.9 percent of the women with atrial fibrillation reported taking warfarin or a blood thinner to reduce their stroke risk.

The researchers conclude that educational strategies must advocate for and target high-risk women.

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- Current recommendations for stroke prevention during early pregnancy in women with a prior stroke history are based on limited evidence, with uncertainty involved in balancing the fetal risk of medication against the maternal risk of recurrent stroke. Researchers in this study surveyed 384 actively practicing U.S. members of the American Academy of Neurology Stroke and Vascular

Neurology section, asking what antithrombotic (or anti-clotting medication), if any, they would use during first trimester pregnancy in women with a prior history of stroke, either unrelated or related to a previous pregnancy.

- Of the 230 responses, 75 percent used some form of antithrombotic therapy for women with a history of prior stroke not related to pregnancy and 88 percent used an antithrombotic for women with a history of prior stroke related to pregnancy.
- About half chose aspirin and 7 percent chose low molecular weight heparin for stroke unrelated to pregnancy; while 41 percent chose aspirin and 25 percent chose low molecular weight heparin for stroke related to pregnancy.

The authors conclude that while most practitioners agree that women with a history of stroke should receive a medication to prevent stroke during the first trimester, they tend to disagree which drug or drugs to use. They recommend a national registry of maternal and fetal outcome data is needed to guide practitioners in this setting.

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Funding sources and individual author disclosures can be found on the respective manuscripts.

To view the special issue of *Stroke*, go to <http://stroke.ahajournals.org>. To learn more about Go Red For Women, visit www.GoRedForWomen.org.

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Additional Resources:

- Knowing the **signs of stroke** can be as simple as five easy steps, learn more at www.strokeassociation.org/giveme5.
- A comprehensive selection of media resources for **Go Red For Women** can be found at http://goredforwomen.org/media_resources.aspx.
- The **HEART for Women Act** is legislation that would help ensure heart disease and stroke are more widely recognized and more effectively treated in women, for more information visit www.americanheart.org/presenter.jhtml?identifier=3039322.
- The **American Stroke Association**, a division of the American Heart Association, offers a number of tools and educational materials to www.strokeassociation.org.

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- **Power To End Stroke** is an education and awareness campaign that embraces and celebrates the culture, energy, creativity and lifestyles of African Americans, visit www.powertoendstroke.org.
- **Stroke Connection** magazine offers information to help reduce stroke risks and help stroke survivors live life to its fullest, to learn more go to www.strokeassociation.org/strokeconnection.
- A comprehensive selection of **media resources for heart and stroke disease among African-Americans** can be found at: www.americanheart.org/presenter.jhtml?identifier=3025278.
- More information on the **Get With the Guidelines** hospital quality improvement program can be found at www.americanheart.org/GetWithTheGuidelines.