

Geriatrics

(Women's Health Series)

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Abstract: As women age, they face challenging health issues. Their average life expectancy is longer than their male counterparts, yet they often have multiple chronic, ongoing health problems that complicate their care, accentuate their infirmity, and reduce their quality of life. Often, they fail to receive the same quality or amount of healthcare service, sometimes because of a lack of data specific to their demographics, at other times for myriad unclear reasons. What data are available suggest that they will usually glean the same benefits as their male and younger female counterparts, often with little increased risk of adverse effects from available medical diagnostic and therapeutic options. Cardiovascular disease, malignancies, musculoskeletal disorders (particularly osteoporosis), and cognitive and psychiatric illness are the most frequent, and often most devastating, health issues in this growing segment of the population. An understanding of the differences in disease frequencies, presentations, and response to treatments is necessary to provide older adult women with optimal health care.

Key Words: epidemiology, geriatric, prevention, treatment, women

Care of the older adult woman requires knowledge of the physiologic changes of aging, skill at recognizing atypical presentations of disease, and careful attention to the treatment considerations specific to this population. Although the average 65-year-old woman has a 50% probability of surviving to age 85, little research has addressed her unique health needs. For example, women are more likely to be disabled and spend twice as much of their lifespan disabled as are men.¹ Health issues in older women will become increasingly important as the overall population continues to age. The approximately

1.53 million women 65 years old and older (and 65,000 older than 85) in the United States in 1900 will have increased to 48.6 million older than 65 years (and 115.8 million older than 85) by 2050.²

Although older women die of the same disorders as men (cardiovascular disease [CVD], cancer, and accidental injuries), associated chronic illnesses can more often reduce their quality of life and augment disease morbidity beyond the levels seen in their male counterparts. The most common health concerns for geriatric women include CVD, malignancy, musculoskeletal diseases, and dementia.³

CVD

CVD is the most common cause of death in women. The mortality rate has not declined as it has in men in recent decades, with several factors potentially contributory.⁴ On average, women are older than men when hospitalized for myocardial infarction, with their first infarct occurring at a mean age of 67.5 years, versus 59.7 years for their male counterparts.⁵ Women are significantly more likely to be obese (28.9% vs 24.4%), diabetic (46.9% vs 31.0%), and hypertensive (62.1% vs 45.3%), but less likely to smoke (23.4% vs 28.7%) or have experienced previous acute coronary syndrome (ACS) (24.7% vs 32.2%) than are men at presentation.^{5,6} More women than men with coronary disease have diabetes, hypertension, hypercholesterolemia, and a contributory family history.⁷ In addition, older women receive some diagnostic and therapeutic interventions less frequently than younger and male patients, which may contribute to the persistent mortality rate.

Physicians frequently fail to recognize a women's often "atypical" symptoms of ischemic heart disease.^{8,9} The

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Key Points

- Geriatric women's health problems differ from those of younger women, largely because of the array of comorbid chronic conditions that occur with aging.
- Although older women are afflicted and likely die of the same disorders as men (cardiovascular disease, cancer, and accidental injuries), associated chronic illnesses can often reduce their quality of life and augment disease morbidity beyond the levels seen in their male counterparts.
- Health issues in older women will become increasingly important as the overall population continues to age.

proportion of women who present without chest pain is significantly higher than men (42.0% vs 30.7%),¹⁰ with women more likely to complain of abdominal discomfort, nausea, dyspnea, and/or fatigue. Other chronic diseases such as arthritis or osteoporosis also can cause chest pain and obscure ischemic symptoms. Older women are more likely to self-report delays in receiving acute cardiovascular care (56%–84% higher odds of delay; $P < 0.01$),¹¹ perhaps for this reason.

Other sex- and age-related disparities in health care may contribute to the lack of improvement in outcomes.¹² Older patients, particularly women, in general receive less cardiovascular health care, and many diagnostic tests and therapies are underused in these patients. Older women are less likely than men to receive preventive interventions such as lifestyle modification advice, β -blockers, and statins.^{1,13}

One reason for these disparities may be that the commonly used Framingham score underestimates cardiac event risk in older females by sixfold compared with men,¹⁴ although newer risk models provide more accurate predictions.¹⁵ A large prospective cohort trial identified that after adjustment for age, blood pressure, diabetes, smoking status, and body mass index, a risk model incorporating non-high-density lipoprotein-cholesterol, total-to-high-density lipoprotein-cholesterol ratio, and high-sensitivity C-reactive protein provided better 10-year risk estimation in women than did the classic Framingham model.¹⁶

Another reason is that current guidelines for primary prevention of CVD focus on people 40 to 74 years old,¹⁷ leading some to extrapolate expected benefits from younger cohorts to older patients, lower the aggressiveness of treatment goals in older patients, or withhold preventive interventions from women older than 75 years.¹⁷

Despite randomized antihypertensive trials in older patients targeting systolic blood pressure goals of <160 mm Hg, guidelines recommend target goals of <140 mm Hg for patients of all ages based primarily on expert opinion.¹⁷ A consensus statement from the United Kingdom¹⁷ suggests that antihypertensive therapy should be initiated in individuals 65 to 79 years old with uncomplicated hypertension who have systolic blood pressure ≥ 140 mm Hg or diastolic blood pressure ≥ 90 mm Hg with a target goal of $<140/90$ mm Hg. In people 80 years old or older, the threshold for starting therapy and the target goal was raised to a systolic pressure of ≥ 150 mm Hg. Chronological versus physiological age considerations are not discussed in these recommendations.¹⁸

Both statins and antihypertensive drugs offer the prospect of reduction in mortality and cardiovascular events in older women.¹⁷ Hormone therapy is not recommended for older adult women with atherosclerotic vascular disease because several prospective trials have documented increased cardiovascular events, mortality, and higher risk of venous thromboembolism and stroke among this cohort.^{19,20}

Other sex-related differences in CVD therapy exist. Women who have coronary artery bypass surgery are less likely to receive a mammary artery graft and more likely to have incomplete

revascularization, bleeding, and procedure-associated mortality compared with men with similar coronary anatomy.²¹ Women have a higher risk of femoral access site complications and bleeding from percutaneous coronary procedures, complications reduced by use of radial access and of bivalirudin as the procedural anticoagulant.⁴ They receive less aggressive therapy during ACS treatment (eg, coronary angiography, 57.8% vs 65.0% for men; $P < 0.001$). Most often, decisions for more conservative treatment are attributed to age, multiple comorbidities, and the lack of age-specific and sex-specific guidelines and screening strategies.^{4,12}

Another reason for treatment disparities may be related to sex differences in mechanisms of disease. For example, the relative frequencies of different mechanisms of acute myocardial infarction differ between the sexes; female patients more frequently demonstrate nonocclusive coronary artery disease but a higher frequency of small-vessel endothelial dysfunction. A study comparing electrocardiograms, serum biomarkers, cardiac magnetic resonance, and coronary angiography including intravascular ultrasound in 50 women with ischemic symptoms meeting criteria for ACS concluded that plaque rupture and ulceration are common in women with myocardial infarction without angiographically demonstrable obstructive coronary artery disease. Vasospasm and embolism are possible mechanisms in some cases, although endothelial dysfunction mediating true myocardial ischemia in the absence of other flow-limiting disease is common.²²

Consensus suggests that when women with CVD receive the standardized cardiovascular assessments and personalized therapy provided to men, they demonstrate similar favorable long-term outcomes.²³ Coronary drug-eluting stents appear to be equally efficacious in reducing restenosis and improving outcomes in men and women with atherosclerotic epicardial coronary disease, with (smaller) second-generation stents being particularly well suited for the small, tortuous coronary arteries found in some women.⁴

Approximately 8 million people in the United States have peripheral artery disease and studies suggest that prevalence among women and men is roughly equal, although age-dependent prevalence in women is lower.²⁴ There are few sex-specific data about peripheral artery disease in women, with clinical presentation and sensitivity/specificity of diagnostic tests not separately characterized. Although clinical studies have included relatively few female patients, existing evidence suggests that treatment benefits and risks may differ between the sexes.²⁵ Clinical research has yet to evaluate sex-based differences that underlie the delayed postmenopausal presentation of peripheral arterial disease in women.

Cancer

Sixty-percent of newly diagnosed malignancies and 70% of all cancer deaths occur in individuals older than 65 years.²⁶ In the US older adult female population, the four most frequent primary malignancies are breast, lung, colorectal, and gynecologic cancers.²⁷

An average woman's lifetime risk of breast cancer is 12%, with almost 50% of all tumors discovered in patients older than 65 years. Despite the fact that increasing age is an independent risk factor,²⁸ older women are screened less frequently than are women 40 to 64 years old and on average have more advanced disease at initial diagnosis.²⁹

Mammography remains the standard screening test for early diagnosis and probably reduces breast cancer mortality in women 40 to 49 years old modestly; however, the reduction in this age group is smaller in women 50 years old and older. Because the benefits and potential harms (eg, false-positive and false-negative outcomes, exposure to radiation, anxiety, discomfort) of screening mammography vary based on an individual woman's risk profile, a tailored personalized screening strategy will better identify those who will benefit most.³⁰

Although the overall mortality rate for breast cancer has declined during the past 2 decades, older adult women have not experienced a better prognosis.³¹ Evidence-based treatment recommendations do not exist specifically for geriatric women. Older adult patients with breast cancer with favorable prognostic factors and less aggressive tumor characteristics tend to receive less aggressive treatments when compared with younger women. Breast-conserving operations, axillary lymph node dissection, postoperative radiation therapy, and adjunctive systemic therapy (especially chemotherapy) are less often provided to older adult patients, perhaps contributing to these suboptimal outcomes. One potential factor has been the lack of enrollment of women older than 70 years into randomized control trials.²⁸ This is particularly concerning when acknowledging that an otherwise healthy 80-year-old woman can be expected to live, on average, 13 more years.³² Small studies suggest that older adult women tolerate components of multimodality breast cancer regimens without excess morbidity when compared with younger patients.³² At this time, it is recommended that breast cancer treatment in women 80 years old and older follow guidelines for the general female population.³³

Lung cancer is the second most common cancer (an estimated 228,000 new diagnoses in 2013),³⁴ but the leading cause of cancer deaths in women.²⁷ Smoking is the most powerful risk factor and diabetes also may increase risk.³⁵ In the general population, non-small-cell lung cancer comprises 80% to 85% of pulmonary malignancies, two-thirds of which are first diagnosed at advanced stages. Initial management is dictated by patient age, functional status and comorbidities, and specific tumor molecular characteristics.³⁶ Stages I to III disease is treated with intention-to-cure, using surgery, chemotherapy, radiation, or combined modality strategies. Stage IV disease is not considered curable, although palliative chemotherapy is available; however, the probability of receiving aggressive therapy (with histocytologic confirmation and intent-to-cure strategies) for non-small-cell lung cancer decreases with age and is lower in women. Older patients appear to tolerate and glean benefit from aggressive diagnostic and therapeutic approaches at rates similar to those of younger patients with comparable disease

features.³⁷ As in many diseases, clinical trials including sufficiently large older adult cohorts are needed to address these issues definitively.

Small-cell lung cancers comprise approximately 20% of pulmonary malignancies and typically present with subclinical distant metastasis, precluding surgical resection for cure. Individuals with limited (stages I–III) disease and good performance status are treated with combined chemotherapy and radiation. Those with extensive (stage IV) disease receive chemotherapy alone. In one study, 75% of all newly diagnosed patients were older than 60 years, 20% were older than 75 years, and 39% had limited disease; however, 48% received no chemotherapy, citing reasons of age and comorbidity (limited disease), patient/family refusal (extensive disease), and poor performance status (both limited and extensive). In addition, women with limited disease received less chemoradiation than did men (12% vs 22%), an observation similar to other sex-related differences noted with other conditions and could be an indication for inadequate inclusion of other comorbid/social factors for women. Although only relatively fit older adult patients were selected for chemotherapy or chemoradiation in this trial, 60% to 75% developed toxicity and could not complete the prescribed treatment regimen.³⁸

Colorectal cancer is the third most common cancer affecting older adult women. In the United States, approximately 70,000 women were diagnosed with colorectal cancer in 2007 and more than 26,000 died of this disease.²⁷ Older women are significantly less likely to undergo colorectal screening than are men (43% vs 50%), yet are less likely to have advanced disease at initial diagnosis (13.5% vs 17%). An afflicted first-degree relative is the most common risk factor, followed by history of inflammatory bowel disease, high-fat/low-fiber or low-calcium diets, obesity, sedentary lifestyle, excessive alcohol consumption, and tobacco use, although few data suggest clinical benefit from lifestyle modification.³⁹ The US Preventive Services Task Force (USPSTF) recommends that screening not be performed routinely in individuals older than 75 years or at all for those older than 85. For individuals between the ages of 75 and 85 who have not undergone screening, decisions about testing should be individualized according to patient health status and potential survival benefits of considered interventions if disease is discovered.⁴⁰

Gynecologic cancers afflict 36/100,000 women annually²⁷ and cervical cancer is the most common. For women 30 to 65 years old, the USPSTF recommends cervical cancer screening with cytology (Pap test) every 3 years or with a combination of cytology and human papillomavirus testing every 5 years. The USPSTF does not recommend screening women older than 65 years who have had appropriate prior screening and are not otherwise at high risk for cervical cancer. Those who had three or more documented, consecutive, technically satisfactory normal/negative cervical cytology tests and who have had no abnormal/positive cytology tests within the last 10 years are not considered screening candidates. Women who have had

a hysterectomy with removal of the cervix, who have no history of high-grade precancerous lesions, or of prior treated cervical cancer also should not be screened. Vaccination against human papillomavirus does not change the above recommendations as of this writing.⁴¹

Musculoskeletal Disorders

Osteoporosis and the complications of hip and spine fracture affect one in three postmenopausal women and osteoporotic fractures are four times more common than stroke in women 80 years old and older.^{1,42} Approximately half of osteoporotic postmenopausal women 65 years old and older have vertebral fractures compared with women younger than 65 (47% vs 12%; $P < 0.0001$), which is coincident with a greater prevalence of low 25-hydroxyvitamin D serum concentrations.⁴³ Fracture rates can be reduced through risk factor reduction and appropriate preventive management. Lifestyle modifications, including fall-avoidance strategies, regular weight-bearing exercise combined, and adequate calcium and vitamin D intake are important measures.⁴⁴ Postmenopausal women and men 50 years old and older presenting with a hip or vertebral fracture, a T score ≤ -2.5 at the femoral neck or spine after appropriate evaluation to exclude secondary causes, low bone mass (T score -1.0 to -2.5 at the femoral neck or spine), and a 10-year probability of a hip fracture $\geq 3\%$ or a 10-year probability of a major osteoporosis-related fracture $\geq 20\%$ based on the US-adapted World Health Organization algorithm should be considered for pharmacologic treatment. Pharmacologic options approved by the US Food and Drug Administration for the prevention and/or treatment of postmenopausal osteoporosis include bisphosphonates, calcitonin, estrogens (estrogen and/or hormone therapy), estrogen agonist/antagonist, and parathyroid hormone. The antifracture benefits of Food and Drug Administration–approved drugs have been studied in women with postmenopausal osteoporosis. There are limited fracture data in glucocorticoid-induced osteoporosis and no fracture data in men. Although bisphosphonates are recommended as a first-line therapy for established postmenopausal osteoporosis, medical, and fracture history, patient preference and cost are additional considerations.^{1,45,46}

Dementia

Data comparing cognitive function between men and women with dementia (including Alzheimer disease) are limited. A meta-analysis of longitudinal data from 577 older women and 271 older men during a mean observation period of 5.8 years suggested that men modestly but significantly outperformed women in all of the cognitive domains examined⁴⁷; differences in dementia severity and/or age did not explain the male advantage. Some researchers have suggested that following menopause, cognitive abilities in healthy geriatric women are adversely affected by the loss of estrogen,^{48,49} a finding supported by studies showing estrogen-treated female patients with Alzheimer disease perform significantly better on

some cognitive tests than do women not receiving hormone therapy. Moreover, no significant differences in measured outcomes were demonstrated between treated female patients and male patients. The duration of estrogen use appeared related to the rate of global cognitive decline and visuospatial ability in nondemented older adult women but not to semantic or episodic memory performance.^{50,51}

A prospective population-based cohort study (681 women 70–92 years old) of the effects of low-dose aspirin and cardiovascular risk factors on cognitive function found treated women experienced less cognitive decline than untreated patients.⁵² The Framingham risk score was used to control for confounding cardiovascular effects. Although more ($\geq 10\%$ 10-year risk of cardiovascular events) patients at high risk for dementia received aspirin, treated patients had demonstrably less cognitive decline independently attributed to treatment.⁵² In contrast, the Women's Health Study showed no significant benefit of aspirin on primary cognitive outcomes.⁵³ The difference between these observations may be attributed to study population differences, with the latter negative study recruiting much healthier women.⁵⁴

Psychiatric Disorders

There is a paucity of mental health research on aging women.⁵⁵ Several observations, however, characterize older women's mental health and identify unique issues. The greater average longevity of women is associated with more frequent chronic illnesses and loss of support from (earlier deceased) loved ones. Ethnic, racial, and sociocultural factors in older women are poorly understood and consequently so is the identification of specific needs and delivery of services by healthcare professionals. In addition, some mental health problems such as prescription medication abuse are particularly underdiagnosed in older adult women.⁵⁵

Major depression in older women may be associated with a greater negative impact than in the general population, perhaps because of their concomitant medical problems, functional decline, family stress and loss, incomplete recovery from other acute illness, and higher rates of suicides/attempts.⁵⁶ A prospective observational study of 6376 postmenopausal women aged 65 to 79 without cognitive impairment at baseline found that among the 8% reporting symptoms of depression at enrollment, mild cognitive impairment, probable dementia, and a combination of mild cognitive impairment and probable dementia more commonly developed after controlling for sociodemographic characteristics, lifestyle and vascular risk factors, cerebrovascular and CVD, antidepressant use, and current and past hormone therapy status. Hormone therapy and baseline cognitive function did not affect these relations.⁵⁷

Conclusions

Older adult women are the fastest growing segment of the population, yet they are one of the most overlooked segments as a focus of healthcare research. The major causes of mortality

for geriatric women are CVD and malignancies and of morbidity are musculoskeletal and psychiatric diseases. Different presentations and mechanisms of serious illnesses contribute to poorer outcomes, although bias continues because available diagnostic and therapeutic options are offered to older women less frequently than to men or younger women. Appropriate medical care for the geriatric female population requires the healthcare provider to be familiar with physiologic, pharmacologic, and pathologic issues of aging, and with the direction and magnitude age and sex exert on epidemiology, individual patient risk, and the risk benefit of both diagnostic and therapeutic interventions.

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