Women, Cancer and Thrombosis

Introduction
Cancer is the leading cause of death in economically developed countries and the second leading cause of death in developing countries. The burden of cancer is increasing as a result of the growing aging population, of which there is a disproportionate number of women than men.

While the overall age standardized cancer incidence rate is almost 25% higher in men than in women, the case could be made that society suffers a greater burden due to serious illness in women than men. Not only do women make up a significant proportion of the workforce in many countries, they are generally responsible in large part for the health and well-being of the family unit.

Women are often the main providers for their children's health and well-being, and are usually the critical link to health care and education for their children. Many women also help manage their partner’s health needs, and more than one in 10 take care of an aging or chronically ill relative, often a parent. These responsibilities are just a portion of the financial, housing, and other daily activities women must balance to meet the family’s needs.

Within the workforce, women are taking on high-profile leadership roles in government and business. Xerox, Hewlett-Packard, Mondelēz International, PepsiCo, IBM, SEB AB, Santander UK, and WellPoint, among others, are led by women, as are the current governments of Argentina, Bangladesh, Brazil, Chile, Denmark, Germany, Latvia, Peru, and South Korea. At the end of her 2008 campaign to be nominated as the Democratic Party candidate for U.S. president – and potentially America’s first female president – Hillary Clinton remarked that her 18 million votes in the Democratic Party's primaries represented 18 million cracks in the glass ceiling.

With an increase in female participation in social, educational, economic, and political spheres, addressing women’s health is a necessary and effective approach to strengthening health systems overall. A commitment to improving women's health is a commitment to improve the world.

References
Needs Assessment

Women and Cancer

Worldwide, there were 6.7 million new cancer cases, 3.6 million cancer deaths, and 17.1 million women living with cancer (within 5 years of diagnosis) in 2012 worldwide. Less developed regions bear a greater burden than more developed regions: 57% (3.8 million) of new cancer cases, 64% (2.3 million) of cancer deaths, and 52% (8.9 million) of the 5-year prevalent cancer cases occurred in the less developed regions.1

While the overall age standardized cancer incidence rate is almost 25% higher in men than in women, breast cancer is the second most common cancer in the world and, by far, the most frequent cancer among women with an estimated 1.67 million new cancer cases diagnosed in 2012 (25% of all cancers). Breast cancer is the fifth cause of death from cancer overall (522,000 deaths) and while it is the most frequent cause of cancer death in women in less developed regions (324,000 deaths, 14.3% of total), it is now the second cause of cancer death in more developed regions (198,000 deaths, 15.4%) after lung cancer.1

Cervical cancer is the fourth most common cancer in women, with an estimated 528,000 new cases in 2012. As with liver cancer, a large majority (around 85%) of the global burden occurs in the less developed regions, where it accounts for almost 12% of all female cancers. There were an estimated 266,000 deaths from cervical cancer worldwide in 2012, accounting for 7.5% of all female cancer deaths.1

Non-gender-specific cancers that affect women include colorectal (second most common), lung (third most common), and stomach (fifth most common).1

Thrombosis and Cancer

Venous thromboembolism (VTE) is a major therapeutic issue in patients with cancer. Defined as deep-vein thrombosis (DVT), pulmonary embolism (PE), and central venous catheter (CVC)-related thrombosis (CRT), VTE is a frequent and serious complication in patients with cancer.

Many factors can increase the risk of VTE among patients with cancer including tumour type, disease stage, surgery, chemotherapy, hospitalization, and immobility.2 For example, cancer patients undergoing surgery have twice the risk of postoperative VTE compared with non-cancer patients undergoing the same surgery.3

Prevalence of VTE in patients with cancer

The presence and associated risks of VTE are underestimated in patients with cancer. From 4% to 20% of patients with cancer have at least one VTE event, whether DVT, CRT, or PE.4 Alternatively, 20% of patients with a VTE diagnosis have an active cancer,5 and 4% to 12% of patients with idiopathic VTE are found to have an underlying cancer.6

In 50% of deceased patients with cancer, undiagnosed DVT or PE was found at autopsy.6 In the past ten years, a significant number of asymptomatic PEs are discovered during chest scans with multislice computed tomography (CT) undertaken for another reason (e.g., cancer staging).

The incidence of VTE in patients with cancer has increased in recent years.7 The observed increase in rates of VTE might be due in part to the use of newer chemotherapy agents; the rate of VTE increased by 47% in patients receiving chemotherapy during the observation period vs. 26% of those not
receiving chemotherapy.\textsuperscript{7} In contrast, there was no significant increase in rate of VTE in patients who had major surgical procedures for treatment of cancer.\textsuperscript{7}

**VTE secondary to the use of central venous catheter is common**

In patients with cancer, the long-term use of central venous catheters (CVC) facilitates chemotherapy, transfusions, parenteral nutrition, and blood samples for laboratory testing. Thrombotic events, though, are common with CVCs. Depending on the study the demonstrated incidence of symptomatic VTE is 0.3\% to 28.3\% in patients with cancer with a CVC.\textsuperscript{8} Pulmonary embolism is the manifestation of VTE in 15.9\% to 25.0\% of CVC-related venous thromboembolisms.\textsuperscript{8}

**VTE in patients with cancer is associated with poor prognosis**

VTE, whether symptomatic or asymptomatic, is the second-leading cause of death in patients with cancer after metastasis,\textsuperscript{9} highlighting the need for optimal prophylaxis and treatment. When cancer is diagnosed at the same time or within a year after VTE, the risk of death is three times greater at one year compared to patients with cancer without VTE.\textsuperscript{10} In hospitalized neutropenic patients with cancer, a VTE event increases the risk of death by two compared to those patients who do not have a VTE.\textsuperscript{11}

**Women, cancer, and VTE**

Ovarian cancer has a higher incidence of VTE than other cancers and is associated with decreased overall survival time.\textsuperscript{12} Clear cell cancers carry the highest risk at 11\% to 27\%.\textsuperscript{12} Risk factors associated with the occurrence of VTE in ovarian cancer are BMI\geq30, clear cell carcinoma, advanced stage, high grade, and CA125 >500 IU/mL.\textsuperscript{13} VTE is also a significant postoperative complication among women with epithelial ovarian cancer. Within 30 days of debulking surgery, there is a cumulative incidence of 6.5\% of symptomatic VTE.\textsuperscript{13}

Prevention and treatment of VTE in women with cancer is essential to patient survival. Appropriate prophylaxis, as well as treatment and management of established VTE in women with cancer can be accomplished by using low-molecular-weight heparins, unfractionated heparin, or fondaparinux, as recommended by 2013 international guidelines.\textsuperscript{14,15} Despite clear recommendations from evidence-based guidelines, however, VTE prophylaxis is underused in women undergoing surgery for gynecologic cancer.\textsuperscript{16}

A survey of members of the Society of Gynecologic Oncologists regarding practice patterns of perioperative VTE prophylaxis in patients with gynecologic cancer showed that only 42\% of respondents used a combination of mechanical and pharmacologic prophylaxis.\textsuperscript{17} Even fewer – only 11\% – prescribed extended duration pharmacologic prophylaxis after patient discharge.\textsuperscript{17} Another study reported that no VTE prophylaxis was used in 39.6\% of women undergoing gynecologic surgery, and only 13.9\% received pharmacologic prophylaxis (alone or in combination with mechanical prophylaxis).\textsuperscript{18} In both of these studies, appropriate VTE prophylaxis was associated with treatment by high-volume surgeons and at high-volume hospitals.\textsuperscript{17,18}

Prolonged postoperative VTE prophylaxis has been shown to improve patient outcomes, as well as being cost-effective. Following the implementation of extended duration prophylaxis with low molecular weight heparin for patients undergoing surgery for gynecologic malignancies, one study demonstrated that the incidence of VTE within 30 days of surgery decreased from 2.7\% to 0.6\%.\textsuperscript{16} A pharmacoeconomic study demonstrated a 12\% reduction in clinically evident VTE and higher five-year survival rate in patients with advanced ovarian cancer, while 95\% of the initial investment cost of prolonged anticoagulation was recovered within one year.\textsuperscript{19}
References


