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THE IMPORTANCE OF EARLY DETECTION OF ONCOLOGICAL DISEASES AMONG WOMEN

Abstract

Early detection of oncological diseases plays a crucial role in reducing mortality rates and improving the quality of life among women. Many types of cancer, including breast, cervical, ovarian, and colorectal cancers, can be effectively treated if diagnosed at an early stage. This article analyzes the significance of early cancer detection among women, reviews existing scientific literature on screening methods, and evaluates research findings related to early diagnostic approaches. The results highlight that regular screening, public awareness, and access to modern diagnostic technologies significantly increase survival rates and reduce healthcare costs.

Keywords

Early detection, oncological diseases, women's health, cancer screening, prevention, diagnosis

Introduction: Oncological diseases remain one of the leading causes of morbidity and mortality among women worldwide. According to global health statistics, cancers such as breast and cervical cancer account for a significant proportion of female cancer-related deaths. Despite advances in medical science, late diagnosis continues to be a major challenge, often resulting in limited treatment options and poor prognosis.Early detection refers to identifying cancer at an initial stage, often before symptoms appear. This approach allows timely intervention, increases

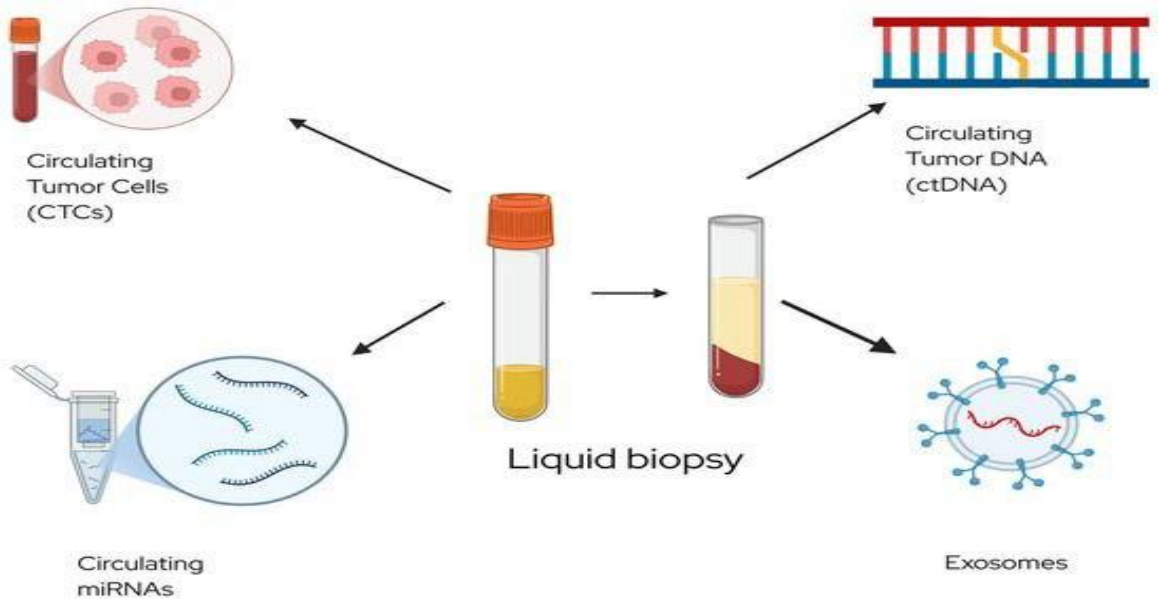
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treatment effectiveness, and reduces the physical, psychological, and economic burden on patients and healthcare systems. Therefore, studying the importance of early detection of oncological diseases among women is of great relevance in modern medicine.

Analysis of the Reviewed Literature: Numerous studies emphasize the effectiveness of early cancer screening programs. According to the World Health Organization, regular mammography can reduce breast cancer mortality by up to 30% in women aged 50–69. Similarly, cervical cancer screening using Pap smear and HPV testing has proven to significantly lower incidence and mortality rates. Research by Smith et al. (2020) indicates that early-stage cancer diagnosis increases the five-year survival rate to over 90% for breast cancer, compared to less than 30% in advanced stages. Other studies highlight that lack of awareness, cultural barriers, and limited access to healthcare services are major factors contributing to late diagnosis among women, especially in developing countries.

Research Results: The analysis of recent research data shows that women who participate in regular screening programs are more likely to be diagnosed at early stages of cancer. Early-stage detection leads to less aggressive treatment methods, shorter recovery periods, and improved quality of life. The findings also demonstrate that educational campaigns and community-based screening initiatives significantly improve women’s participation in preventive examinations. Moreover, the integration of modern diagnostic technologies, such as digital imaging and biomarker testing, enhances diagnostic accuracy and early identification of oncological diseases.

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Epithelial ovarian cancer (EOC) constitutes the second most lethal gynecologic malignancy, with a projected 21,410 new cases and 13,770 deaths recorded in the United States in 2021 . For the purposes of this chapter, the term “ovarian cancer” will be used to describe cancers arising in the ovary, fallopian tube, and peritoneal cavity, all of which are histologically similar and treated identically. In ovarian cancer, early-stage disease is frequently curable. Unfortunately, the majority (upward of 65%) of patients present with advanced-stage disease, requiring invasive surgery and chemotherapy, with high rates of relapse and death [2]. Early detection and prevention are areas of critical need.

When we consider a patient’s risk of ovarian cancer, the strongest patient-related risk factor is increasing age. The median age at diagnosis is 63 years old. The incidence of ovarian cancer increases with each additional year of life, climbing from 15.7 per 100,000 age 40 years to 54 per 100,000 at age 70 years [3]. Other reproductive factors can alter risk. Pregnancy and parity are associated with a decreased risk of ovarian cancer. Compared to nulliparous women, those who have had one live birth have approximately a 25% decrease in risk of ovarian cancer, while women with two or more live births have an approximate 42% risk reduction. Other protective factors include breastfeeding, bilateral tubal ligation,

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hysterectomy, and oral contraceptive pills, particularly with more than five years of continuous use

Genetic factors, including family history and germline mutations, can drastically increase a woman's lifetime risk of developing ovarian cancer. Up to twenty percent of ovarian cancers are related to identified, inheritable mutations in certain genes. Hereditary ovarian cancer syndromes are most often linked to BRCA1 and BRCA2 genes, which are considered the highest risk genes, with lifetime risks as high as 46% and 20%, respectively [5]. Many other genes are emerging as being associated with higher risk, including BRIP1, PALB2, RAD51C, RAD51D, and SMARCA4, [6] with increased risks between 5–15%. Other patient-related factors that are associated with higher risk of ovarian cancer include race (white women are at highest risk), early menarche and later menopause There are generally considered to be two groups of epithelial ovarian cancer. Type I cancer comprises low-grade serous, low-grade endometrioid, clear cell and mucinous carcinomas. The behavior of these cancers is typically slower-growing, and they often present with tumor confined to the ovary, rather than disseminated disease. Type I cancers are often characterized by specific somatic mutations, including KRAS, BRAF, ERBB2, CTNNB1, PTEN, PIK3CA, ARID1A, and PPP2R1A, which target cell signaling pathways. Type I tumors rarely harbor TP53 mutations as opposed to Tyle II tumors. These cancers appear to develop in a stepwise fashion from precursor lesions, such as borderline tumors and endometriosis.

Type II cancers include high-grade serous, high-grade endometrioid, malignant mixed mesodermal tumors (carcinosarcomas), and undifferentiated carcinomas. They are aggressive, present in advanced stage, and have a very high frequency of TP53 mutations (>95%). Serous tubal intraepithelial carcinomas (STIC lesions) are now known to be very common precursor lesions for high-grade serous carcinomas and are also TP53 mutated. STIC lesions spread from the open fimbriated ends of the fallopian tubes throughout the peritoneal cavity [8,9,10]. A large group of

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studies included patients with and without known genetic risk and confirmed that STICs and early invasive tubal carcinomas occurred in both groups. STIC lesions have also been identified in women without ovarian cancer who have their ovaries and tubes removed for other indications. The presence of identical TP53 mutations in STICs and concomitant ovarian high-grade serous cancers supports a clonal relationship between the two.

Identifying a known precursor lesion is an important step as scientists and clinicians attempt to detect ovarian cancer at earlier stages. Ovarian cancer development is a multistage process, the details of which are still being elucidated. The identification and characterization of oncogenes has provided the structural link between the carcinogen/promoter model of malignancy and the biochemical pathways that first become altered as cells become cancerous. Researchers have shown that malignant cells must have the ability to generate their own mitogenic signals, resist growth-inhibitory controls, evade apoptosis and to proliferate without limits while acquiring vasculature [11]. Additionally, the process of STIC lesions undergoing malignant transformation may produce changes in cellular metabolism. The above pathways put into context and offer opportunities to explore different approaches to the prevention and early detection of ovarian cancer.

.CONCLUSION : Early detection of oncological diseases among women is a vital factor in reducing cancer-related mortality and improving long-term health outcomes. Regular screening, increased awareness, and accessibility of diagnostic services are key components in achieving early diagnosis. Healthcare systems should prioritize preventive strategies and educational programs to encourage women to undergo routine examinations. Strengthening early detection efforts will not only save lives but also contribute to the overall improvement of women's health and well-being.

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