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REVIEW

Cancer Research in Translation Ovarian and Peritoneal Neoplasms: Comprehensive Review

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Abstract

Ovarian Cancer is a leading cause of death in Women often diagnosed at the late stage due to several factors generally due to its asymptomatic nature until the disease is advanced. Symptoms can be similar to other conditions, such as irritable bowel syndrome or menopause. Often Ovarian Cancer spread through omentum as the cells directly invade the omentum from the ovarian tumour. In this process the cells can break away from ovarian tumour and spread through peritoneum fluid, implanting on the omentum which is rich of blood supply, making it a fertile ground for cancer cells to grow. Omentum involvement is a common feature of advanced ovarian cancer often making surgical debulking complicated. This review aims to summarize the current understanding of the relationship between the peritoneal Neoplasms and ovarian cancer highlighting the molecular mechanisms, clinical implications and potential therapeutic strategies. Peritoneal neoplasm is a type of carcinomatosis where cancer cells spread through the peritoneum originating mostly from other cancers. Cancer cells can also spread to the omentum through lymphatic system. The relationship between peritoneum cancer and ovarian cancer is complex, involving various molecular mechanisms and cellular interactions.

Keywords: Ovarian cancer- Cytoreductive surgery- peritoneal neoplasms- Targeted therapies

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Introduction

Ovarian Cancer is a deadly gynecological cancer that originates in the ovaries [1] which is becoming a leading death in patients. Where as Peritoneal Neoplasms is an advanced ovarian cancer which is associated with poor prognosis and limited treatment options. The current challenges is mainly on daigonosis which mainly appear in advanced stage. This makes the treatment even more challenging. As it's a rare form of cancer with limited efficacy, highlighting the need for novel therapeutic approaches [2]. The main Research Directions is investigating the molecular pathways involved in peritoneal neoplasms to identify potential therapeutic targets. Current Research is also investigating on early Detection Biomarkers [3] which mainly focuses on monitoring ovarian cancer. The importance of understanding And exploring new treatment strategies are under focus including targeted therapies and immunotherapies. Both ovarian [4] and peritoneal cancers are different malignancies [5] particularly when diagnosed at advanced stage. The current research has shown that high-grade serous ovarian [6] and peritoneal cancers display distinct genetic and post translational signatures, considering both are two different diseases and should be treated accordingly. The importance of learning as well as understanding of peritoneal neoplasm is also crucial as more cases can be seen in women over 60 [7] and is extremely rare in Men. This type of Cancer occurs when cancer from other organs such as the ovaries [8] spreads to the peritoneum.

Cancer from Molecular pathophysiology perspective: The perspective of ovarian cancer and peritoneal neoplasm [9] involves complex interactions with factors involving genetic, epigenetic and environment.

Key aspects in Molecular pathophysiology include Genetic Mutations, signaling pathways, epigenetic Modifications. The increased risk of Ovarian cancer

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comes genetically with mutations of genes BRCA1 and BRCA2. Tumor suppressor gene mutations also common among these cancers. Mutations often influences tumor aggressiveness spreading very rapidly with vague symptoms reaching an advance stage. Signaling pathway promote ovarian cancer cell proliferation and survival. The main mechanisms of these pathways is that they regulate cell migration, invasion, adhesion enhancing the tumor growth in peritoneum. Studies show that these pathways often shows resistance to Chemotherapy [10] which impacts patients prognosis. Epigenetic modifications can silence tumor suppressor genes contributing cancer development [11]. They have the potential to activate oncogenes promoting tumor growth and progression often causing resistance to chemotherapy.

In conclusion, ovarian cancer often referred to as "silent killer" due to its non specific symptoms, because of the location of ovaries located deep within the pelvis, making it difficult to detect tumors early. Tumors in ovarian cancer often grows slowly, that may not be immediately noticeable. Some might confuse with other common conditions such as irritable bowel syndrome [12], digestive issues such as bloating, menopause. Symptoms may develop gradually making it challenging to pinpoint the cause. Because of the above vague symptoms women often get to know when they experience immense abdominal pain by the time it reaches third stage in most cases. CT scans [13] play significant role in detecting and staging ovarian cancer.

Impressions and Findings

The computer Tomography scan uses X-rays and computer technology to produce detailed cross-sectional images of the body. They detect the ovarian masses, assess tumor size and location and identify metastasis. CT scan often detects Ascites which is fluid accumulation in the abdominal cavity which can be a sign of advanced ovarian cancer. But these findings may not detect small ovarian tumors or early stage cancer. Hence due to vague symptoms early detection and awareness on ovarian cancer and peritoneal neoplasms [14] will lead to advanced ovarian cancer and this lead to peritoneal metastasis [15]. When the stage advances the scan shows findings of Diffuse omental thickening with caking , omental nodules and mesenteric enhancing soft tissue density nodules. In CT mainly ovaries can be seen enlarged with heterogenous enhancement. Small surface deposits and localized fluid collection can be visualized on the bare area of liver. Hence further evaluating possibility of carcinoma ovary with peritoneal neoplasms [16].

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Statement of Transparency and Principals

- Author declares no conflict of interest
- Study was approved by Research Ethic Committee of author affiliated Institute.
- Study's data is available upon a reasonable request.
- All authors have contributed to implementation of this research.

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