Enhancing Prognostication and Treatment Strategies of Endometrial Carcinoma

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Description

Endometrial carcinoma, a prevalent malignant gynecological cancer, poses a significant health concern worldwide, with approximately 382,000 new cases reported annually. The incidence of endometrial cancer is on the rise, particularly in high-income countries, attributed to the increasing prevalence of risk factors such as obesity, metabolic syndrome, and advancing age. Despite its generally favorable prognosis, with an overall 5-year survival rate of 80%, a substantial proportion of patients experience recurrence, highlighting the need for improved risk stratification and treatment strategies. Approximately 18% of endometrial cancer patients face recurrence, and for these individuals, treatment options are limited, and mortality rates remain elevated. This underscores the importance of identifying patients with aggressive tumor biology and poor outcomes, even in the context of optimal treatment.

Molecular alterations

The prognosis of endometrial carcinoma is largely influenced by various factors, including tumor stage, histological subtype, molecular characteristics, and patient-specific factors such as age and comorbidities. While early-stage, low-grade tumors often have favorable outcomes, higher-grade tumors and those with specific molecular alterations may exhibit more aggressive behavior and poorer prognosis. Advancements in molecular profiling techniques have provided insights into the heterogeneity of endometrial cancer and have enabled the identification of distinct molecular subtypes with varying clinical behaviors. For example, The Cancer Genome Atlas (TCGA) project identified four molecular subtypes of endometrial cancer: POLE-ultramutated, MSI-hypermutated, copy-number low, and copy-number high. These subtypes have distinct genomic features and clinical outcomes, highlighting the importance of personalized approaches to treatment. In addition to molecular profiling, emerging biomarkers and imaging modalities hold promise for improving risk stratification and treatment decision-making in endometrial cancer. Biomarkers such as *p53*, *PTEN*, and hormone receptor status have been implicated in tumor aggressiveness and may help identify patients at higher risk of recurrence. Similarly, advanced imaging techniques, including MRI and PET-CT, offer valuable information regarding tumor characteristics, lymph node involvement, and distant metastases, aiding in treatment planning and monitoring. Moving forward, efforts to refine risk stratification and treatment selection in endometrial carcinoma must focus on integrating multiple clinical and molecular factors to develop robust predictive models.

Molecular mechanisms

Multidisciplinary approaches involving gynecologic oncologists, pathologists, radiologists, and molecular biologists are essential for comprehensive patient management. Additionally, clinical trials evaluating novel therapeutic agents and targeted therapies are critical for improving outcomes, particularly in patients with recurrent or advanced disease. In conclusion, while the prognosis of endometrial carcinoma is generally favorable, a subset of patients experience recurrence and face limited treatment options. Identifying patients with aggressive tumor biology and optimizing treatment strategies are paramount to improving outcomes and reducing mortality in this patient population. Continued research efforts aimed at elucidating the molecular mechanisms driving endometrial cancer progression and identifying novel therapeutic targets will be crucial in advancing the field and improving patient care. Furthermore, efforts should be directed towards the development of non-invasive diagnostic tools and monitoring strategies to facilitate early detection of recurrence and metastasis. Liquid biopsies, which involve the analysis of circulating tumor cells, cell-free DNA, and microRNAs, hold promise for providing real-time information on tumor dynamics and treatment response. Additionally, the integration of artificial intelligence and machine learning algorithms into clinical practice may aid in the interpretation of complex data and improve prognostication. By leveraging these innovative approaches, we can enhance our ability to identify high-risk patients, tailor treatment strategies, and ultimately improve outcomes in endometrial carcinoma.