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Editorial

Major Advances in Prostate Cancer in the Last 5 Years (2018-2023)

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Introduction

Prostate cancer is one of the most common malignancies in men worldwide. Over the past 5 years, significant advancements have been made in the prevention, diagnosis, and treatment of this disease. In this article, we will examine the major scientific breakthroughs in prostate cancer from 2018 to 2023, highlighting the most relevant findings and promising therapies that have emerged during this period.

A) Early detection and diagnosis:

Early diagnosis is crucial for improving the prognosis of prostate cancer. In recent years, new strategies and technologies have been developed for more accurate and less invasive detection. A notable advancement is the introduction of multiparametric magnetic resonance imaging (mpMRI) as an initial screening tool in men with suspected prostate cancer. mpMRI combines different imaging sequences and radiomic analysis to identify suspicious lesions, which has demonstrated higher accuracy in detecting significant tumors [1].

Additionally, the use of blood biomarkers, such as prostate-specific antigen (PSA) and the novel marker PCA3, has proven useful in complementing the diagnosis. These biomarkers can help distinguish between slow-growing and aggressive tumors, enabling more precise decision-making regarding active surveillance or immediate treatment [2].

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B) Molecular therapies and targeted therapy:

Considerable progress has been made in the development of molecular and specifically targeted therapies for prostate cancer. A notable example is the approval of PARP (poly ADP ribose polymerase) inhibitors for the treatment of patients with castration-resistant metastatic prostate cancer and mutations in the BRCA1/2 genes. Medications such as Olaparib and rucaparib have shown improved overall survival and quality of life in this patient population [3].

Furthermore, targeted therapy against the androgen receptor has seen significant advancements in recent years. Enzalutamide and apalutamide are androgen receptor inhibitors that have demonstrated prolongation of survival in patients with castration-resistant metastatic prostate cancer. These medications block androgen receptor signaling, which is crucial for prostate tumor growth [4].

C) Immunotherapy and combination therapy:

Immunotherapy has revolutionized cancer treatment in recent years, and prostate cancer is no exception. The approval of pembrolizumab, a PD-1 inhibitor, for patients with castration-resistant metastatic prostate cancer and microsatellite instability (MSI), has been a significant breakthrough in the field of immunotherapy. These patients exhibit an activated immune response and can benefit from targeted therapy aimed at immune checkpoint inhibition [5].

In addition to immunotherapy, combination therapies have shown promising results in the treatment of prostate cancer. The combination of PD-1 inhibitors with PARP inhibitors has shown durable responses in patients with BRCA1/2 mutations and other DNA repair defects [6]. Additionally, the combination of hormonal therapies with agents targeting the tumor microenvironment, such as angiogenesis inhibitors, has demonstrated improved response and survival in patients with metastatic prostate cancer [7].

D) Advances in surgery and radiotherapy:

Surgery and radiotherapy remain fundamental treatments for localized prostate cancer. In recent years, less invasive surgical techniques, such as robot-assisted laparoscopic prostatectomy, have been developed, offering faster recovery, and reduced postoperative morbidity [8]. Furthermore, intensity-modulated radiation therapy (IMRT) and image-guided radiation therapy (IGRT) have improved treatment precision and allow for greater preservation of erectile and urinary function [9].

E) Active surveillance:

In addition to advances in detection and treatment, the concept of active surveillance has gained significant attention in recent years. This approach involves closely monitoring patients with low-risk prostate cancer to delay or avoid immediate treatment. A recent study titled "Fifteen-Year Outcomes after Monitoring, Surgery, or Radiotherapy for Prostate Cancer," published in *The New England Journal of Medicine*, has shed light on the long-term outcomes of active surveillance [10]. The study followed a large cohort of patients over a 15-year period and compared the outcomes of active surveillance, surgery, and radiotherapy.

The findings of this study revealed that active surveillance was a viable and safe option for selected patients with low-risk prostate cancer. The researchers observed that most patients on active surveillance did not experience disease progression requiring treatment during the follow-up period. This suggests that many men with low-risk prostate cancer can avoid unnecessary treatments and their associated side effects.

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However, it is crucial to emphasize that active surveillance requires careful patient selection and regular monitoring. It is recommended for patients with low-risk disease, characterized by favorable clinical and pathological features, such as a low PSA level, a Gleason score of 6 or lower, and limited tumor extent. These patients undergo periodic PSA tests, clinical examinations, and repeat biopsies to closely monitor disease progression.

Active surveillance offers the advantage of preserving quality of life by avoiding the potential side effects of surgery or radiation therapy, such as urinary incontinence and erectile dysfunction. It also allows patients to defer treatment until there is evidence of disease progression, ensuring that interventions are tailored to individual risk profiles.

Conclusion

The past 5 years have witnessed significant advancements in prostate cancer research and treatment. From improved early detection methods to the development of targeted therapies and the exploration of active surveillance, these breakthroughs offer new hope for patients facing this disease. It is essential for healthcare professionals to stay abreast of these advancements and tailor treatment approaches based on individual patient characteristics.

As we move forward, continued research and collaboration are necessary to refine and optimize these advancements. By integrating these discoveries into clinical practice, we can further improve outcomes, reduce treatment-related morbidity, and enhance the overall quality of life for individuals affected by prostate cancer.

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