

## FEATURES OF DIAGNOSIS AND TREATMENT OF PROSTATE CANCER IN PATIENTS WITH COMORBID PATHOLOGY: CURRENT STATE OF THE PROBLEM

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<https://doi.org/10.5281/zenodo.20628519>

### Abstract

Prostate cancer (PCa) remains one of the most common malignant neoplasms among men worldwide. Due to population aging, the prevalence of concomitant chronic diseases among patients diagnosed with prostate cancer is steadily increasing. Cardiovascular diseases, diabetes mellitus, obesity, chronic kidney disease, and respiratory disorders significantly influence diagnostic accuracy, treatment selection, oncological outcomes, and quality of life. The presence of comorbidity complicates decision-making and requires an individualized multidisciplinary approach. This review analyzes current evidence regarding the impact of comorbid conditions on prostate cancer diagnosis and treatment and discusses strategies aimed at improving outcomes in this patient population.

**Keywords:** prostate cancer, comorbidity, diagnosis, treatment, cardiovascular diseases, diabetes mellitus, personalized medicine.

### Introduction

Prostate cancer is the second most frequently diagnosed malignancy and one of the leading causes of cancer-related mortality among men worldwide. According to recent epidemiological data, more than 1.4 million new cases are diagnosed annually. The majority of patients are older than 65 years and often suffer from multiple chronic diseases.

Comorbidity is defined as the coexistence of one or more chronic disorders in addition to the primary disease. In patients with prostate cancer, comorbidity influences disease progression, treatment tolerance, postoperative complications, survival outcomes, and healthcare costs.

The increasing prevalence of chronic diseases necessitates the development of optimized diagnostic and therapeutic approaches for patients with prostate cancer and concomitant pathology.

#### Current Epidemiology of Comorbidity in Prostate Cancer

The prevalence of comorbidity among patients with prostate cancer ranges from 50% to 80%. Cardiovascular diseases are the most common accompanying conditions, followed by diabetes mellitus, obesity, chronic pulmonary disorders, and renal insufficiency.

Several studies have demonstrated that patients with high comorbidity burden experience increased mortality independent of cancer progression. Therefore, assessment of comorbidity should be considered an essential component of patient evaluation.

#### Impact of Cardiovascular Diseases

Cardiovascular diseases significantly affect treatment selection and prognosis. Radical prostatectomy may pose substantial perioperative risks in patients with coronary artery disease or heart failure.

Androgen deprivation therapy (ADT), widely used in advanced prostate cancer, has been associated with metabolic alterations, increased insulin resistance, dyslipidemia, and elevated cardiovascular risk.

Recent evidence suggests that cardiovascular evaluation before initiating ADT may reduce treatment-related complications. Collaboration between oncologists, urologists, and cardiologists has become increasingly important in modern prostate cancer management.

#### Influence of Diabetes Mellitus

Diabetes mellitus affects both cancer biology and treatment outcomes. Hyperinsulinemia and chronic inflammation may contribute to tumor progression.

Patients with diabetes frequently exhibit delayed wound healing, increased postoperative infection rates, and poorer recovery following surgical interventions.

Moreover, ADT can worsen glycemic control, necessitating careful monitoring of blood glucose levels throughout treatment.

#### Obesity and Metabolic Syndrome

Obesity represents a growing global health concern. Excess adipose tissue promotes chronic inflammation, hormonal imbalance, and insulin resistance, factors associated with aggressive prostate cancer behavior.

Obese patients often present technical challenges during surgery and may experience increased rates of perioperative complications.

Several studies have demonstrated associations between obesity and higher-grade tumors, biochemical recurrence, and cancer-specific mortality.

#### Modern Diagnostic Approaches

Early diagnosis remains critical for successful prostate cancer management.

Current diagnostic methods include:

- Prostate-specific antigen (PSA) testing;
- Digital rectal examination;
- Multiparametric magnetic resonance imaging (mpMRI);
- MRI-targeted biopsy;
- Histopathological evaluation;
- PSMA PET/CT imaging.

Multiparametric MRI has substantially improved the detection of clinically significant tumors while reducing unnecessary biopsies.

PSMA PET/CT has emerged as a valuable tool for staging and recurrence detection, particularly in high-risk patients.

#### Role of Comorbidity Assessment

Comorbidity assessment tools help clinicians estimate treatment-related risks.

The most commonly used instruments include:

- Charlson Comorbidity Index (CCI);
- Adult Comorbidity Evaluation-27 (ACE-27);
- Cumulative Illness Rating Scale (CIRS).

These tools facilitate individualized treatment planning and improve risk stratification.

#### Treatment Strategies

Management options for prostate cancer include:

1. Active surveillance;

2. Radical prostatectomy;
3. Radiation therapy;
4. Androgen deprivation therapy;
5. Chemotherapy;
6. Novel hormonal agents.

The presence of significant comorbidity may favor less aggressive treatment approaches in selected patients.

Conversely, healthy older individuals with limited comorbidity may benefit from curative interventions comparable to younger patients.

#### Multidisciplinary Approach

The complexity of prostate cancer management in comorbid patients requires multidisciplinary collaboration involving:

- Urologists;
- Medical oncologists;
- Radiation oncologists;
- Cardiologists;
- Endocrinologists;
- Geriatricians.

Such cooperation allows optimization of treatment outcomes and reduction of adverse events.

#### Future Perspectives

Advances in molecular diagnostics, artificial intelligence, and precision medicine are expected to improve risk assessment and treatment selection.

Biomarker-guided approaches may facilitate personalized management strategies that account for both tumor characteristics and patient-specific comorbidity profiles.

#### Conclusion

Comorbidity significantly influences the diagnosis, treatment, and prognosis of patients with prostate cancer. Cardiovascular diseases, diabetes mellitus, and obesity represent the most prevalent accompanying conditions and require careful consideration during clinical decision-making. Comprehensive comorbidity assessment and multidisciplinary management can improve treatment outcomes and quality of life. Future research should focus on personalized approaches integrating oncological and comorbidity-related factors.

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