

Prostate Cancer

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Prostate cancer is the most common cancer in males, and the fifth leading cause of cancer death in men globally. In 2020 it accounted for 1,414,249 newly diagnosed cases and 375,000 deaths worldwide.^{1,2} In Ireland, approximately 3,890 men are diagnosed with prostate cancer annually indicating that 1 in 7 men in Ireland will be diagnosed with prostate cancer in their lifetime.^{3,10}

The most common risk factor for prostate cancer is increasing age. It usually affects men over the age of 50, with most cases occurring in those over the age of 65. Genetic factors play a role, and family history is associated with an increased risk. Risk is higher in males with a relative who developed prostate cancer at a younger age and in males who have more than one relative with the disease. Men with a father or brother diagnosed with prostate cancer by age 50 years have an approximately two-fold increased risk of prostate cancer.³ The incidence rate for men under the age of 50 years is 1 in 350, increasing to 1 in 52 for those aged 50 to 59 years. The incidence rate is nearly 60% in men over the age of 65 years. Prostate cancer accounts for 30 % of all newly diagnosed cancers in Irish males and 11% of all invasive cancers in Ireland.^{3,4}

The aetiology of prostate cancer is the subject of numerous studies and remains largely unknown compared to other common cancers. While the exact causes of prostate cancer are not fully understood many cases do appear to be related to aberrant cell signalling that involves male androgen hormones, particularly testosterone and its metabolites.⁵

Diagnosis

Prostate cancers usually grow very slowly, and symptoms may not occur for some time. If the prostate is enlarged, a preliminary diagnosis can be made by rectal examination or transrectal ultrasound (TRUS). Diagnosis is primarily based on prostate-specific antigen (PSA) testing, MRI scans, and prostate tissue biopsies. PSA testing for screening remains controversial.² A PSA blood test is used to detect prostate tumours in their earliest stages in high-risk individuals. Originally introduced as a tumour marker for the detection of cancer recurrence, PSA testing became widely adopted as a screening tool for prostate cancer. However, it is not prostate cancer-specific and other prostate conditions, such as benign prostatic hyperplasia (BPH) or prostatitis, can also affect PSA levels.⁴ If prostate cancer is suspected a biopsy is carried out to confirm the diagnosis.¹² When detected early, prostate cancer is treatable. A large majority of prostate cancers are diagnosed either before they have spread or when they have spread only locally. Survival rates in these cases are very high.^{3,6}

The TNM staging system determines the size of the tumour (**T**); if the cancer has spread to the lymph nodes (**N**); and if the cancer has spread to other parts of the body-metastasis (**M**).¹¹

The Gleason Score

The Gleason Score is a grading system for prostate cancer aggressiveness. It ranges from 1-10, with higher scores indicating faster growth and spread. It combines two grades (primary and secondary) to assess the tumour. A primary grade from 1-5 is given to describe the cells that make up the largest area of the tumour and a secondary grade from 1-5 is given to describe the cells of the next largest area. The two grades are added together to determine the Gleason score. Scores of 6 or less describe cancer cells that look like normal cells and suggest that the cancer is likely to grow slowly. A score of 7 indicates intermediate risk, and a score of 8 or higher indicates rapid spread. Primary score 3 and secondary 4 has a better outlook, while primary 4 and secondary 3 are more aggressive.^{7, 11}

Treatment

Treatment options for patients with prostate cancer depend on the stage and grade of the cancer and include active surveillance, watchful waiting, hormone therapy, radical prostatectomy, external beam radiotherapy, and brachytherapy.^{3, 10, 11} Active surveillance is used to monitor the cancer closely. This involves a prostate-specific antigen (PSA) blood test every three months and a digital rectal exam (DRE) every six months for the first year followed by a PSA blood test every 6 months and a DRE at least once a year. Prostate biopsies and imaging tests may also be done every 1 to 3 years.^{3,8} Because prostate cancers usually progress slowly, a “watchful waiting” approach rather than immediate treatment may be recommended. This is especially true for patients who are elderly or in otherwise poor health. In patients with intermediate or high-risk localised prostate cancer with a real prospect of long-term disease control and those with locally advanced disease, radical prostatectomy or radical radiotherapy should be offered.^{3, 4}

Hormone therapy is the primary treatment for metastatic prostate cancer but is also used for patients with locally advanced, non-metastatic disease. For localised prostate cancer, treatment choice depends on risk level. Hormone therapy targets androgens, which fuel prostate cancer growth, using drugs like Luteinizing Hormone-Releasing Hormone (LHRH) analogs or LHRH agonists such as buserelin, goserelin, leuprorelin acetate or triptorelin to block androgen production. Side effects include reduced libido, sexual dysfunction, osteoporosis, gynecomastia, and hot flashes.^{3,4, 6}

Brachytherapy treats prostate cancer by placing radioactive seeds in the prostate, targeting cancer cells with minimal harm to nearby healthy tissue. There are two types: HDR brachytherapy (temporary, multiple sessions) and LDR brachytherapy (permanent, gradual

radiation release). It can be the sole treatment for early-stage, non-spreading cancer or combined with external beam radiation or hormone therapy for more advanced cases.^{3,9}

In external beam radiation therapy, beams of radiation are focused on the prostate gland from a machine outside the body. This type of radiation can be used to try to cure earlier stage cancers, or to help relieve symptoms such as bone pain if the cancer has spread to a specific area of bone.³

Surgery is an option for prostate cancer that has not spread. Radical prostatectomy is considered if lymph nodes are cancer-free but carries the risks of impotence and urinary incontinence. Transurethral resection (TURP) relieves symptoms but does not remove all cancer. In men who are unable to have traditional surgery, cryosurgery may also be used. If the cancer has spread from the prostate, radiation therapy may be used. Bi lateral orchidectomy should be offered to all patients with metastatic prostate cancer as an alternative to continuous LHRH agonist treatment. If surgery or hormone therapy fails, chemotherapy may be used. While chemotherapy can help relieve symptoms, it cannot cure metastatic prostate cancer.^{3,6}

References

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