

## COVID-19 Vaccination and Prostate Cancer Patients

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Prostate cancer today is the leading cause in incidence and prevalence of malignant disease in men over 65 years of age and one of the main causes of death from cancer in this same group of patients [1]. It is these same individuals who are designated a population at very high risk of contagion and death in the face of the fearsome SARCOV-2 pandemic. Faced with the fearsome danger, the uro-oncology consultation faces a new challenge in the ethical management of patients and their families: can they be vaccinated for the prevention of contagion? Does the administration of the vaccine have side effects on prostate disease? Are there any contraindications to the treatment they are receiving for cancer?

The current SARCOV-2 virus pandemic has changed not only health systems, even the management and survival data of cancer patients. Today humanity faces the possibility or not of access to vaccination against the virus and one of the frequent questions of cancer patients is whether or not they can be vaccinated due to their previous condition.

We know very little about the short and long-term effects of COVID-19 infection concurrent with oncological disease other than its high mortality, mainly in these patients, who are mostly over 70 years of age with other associated morbidities.

Mou., *et al.* with data of the international prospective register of systematic reviews (PROSPERO), describes to clarify the prevalence of prostate cancer among men diagnosed with COVID-19 and to study the differences in the clinical outcomes of COVID-19 male patients with or without prostate cancer. It is clear that prostate cancer is a significant hazard factor for men infected with SARS-CoV-2. However, in the population at risk of infection by the virus, the male sex and the elderly have a higher prevalence where prostate cancer occupies a leading place in the chronic diseases. This knowledge can better maintain male health and guide clinicians to prevent COVID-19 in prostate cancer patients [2].

Several studies relate the distinct mechanisms for trans-membrane serine protease 2 (TMPRSS2) and angiotensin converting enzyme 2 (ACE2) as critical targets of SARS-CoV-2 that facilitate viral entry into host cells. TMPRSS2 expression could explain organ-specific inhibition of SARS-CoV-2 infection by androgen-targeted therapy for prostate cancer patients [3].

Patients with prostate cancer can be in different stages of their disease and therefore receiving dissimilar treatments according to the disease and organic functioning, it would be based on each and every one of its characteristics (of the patient and their treatment) that would be defined according to risk/type of vaccination/benefit if you could enter a vulnerable group to receive vaccine, so the selection would always be individual.

First at all, in this type of patient, a series of considerations are being defined by the American Society of Oncology (ASCO), expert opinion of a committee of the National Comprehensive Cancer Network (NCCN) and the European Cancer Society (ESMO). They recommend who are patients who have high risk of developing severe form of COVID-19 and death, pausing, stopping or never starting anticancer treatment due to the SARS-CoV2 infection, fear of contracting the virus and halting or limiting regular checkups and monitoring [3,4].

By other hand, different types of COVID-19 vaccines are development with mechanisms of antigen presentation, and generation of protective immunity: Inactivated virus (SinoVac (CoronaVac + aluminum) SinoPharm (Inactivated whole virus SARSCoV-2 + aluminum)), Protein subunits (Novavax (NVX-CoV2373) Vector Institute (EpiVacCorona)), Replication incompetent adenoviral vector (AstraZeneca (ChAdOx1 nCoV-19; AZD1222) Johnson and Johnson (Ad26.COV2.S) CanSino Biologics (Ad5-nCoV) Gamaleya (Sputnik V)), DNA (Inovio (INO-4800)), mRNA (Modern (mRNA-1273) Pfizer-BioNTech (BNT162b2)), Conjugates (Finlay-Soverana 02). All of them with advantages and disadvantages [5].

Patients with prostate cancer generally have only castrations treatment or radical prostatectomy. Those patients can receive immunizations as the healthy population in the same risk group as long as their general conditions allow it and would benefit from immunological protection.

There are patients with prostate cancer who receive treatment with ionizing radiation, unlike other oncological pathologies in prostate cancer, unique fields formed on the pelvis and/or metastatic site (generally bone or soft tissue) are irradiated, which does not deteriorate the bone marrow/immune function and does not contraindicate vaccination. Related to radiant treatment or radio metabolic agents, it is important to define the elapsed time of ionizing radiation, the source used, the fields and doses. It must be correlated with the stage of the disease, the presence of symptoms such as emergency pain or compression, and the general and immunological deterioration of the patient to define benefit/risk of vaccination.

There is a third group of patients with active metastatic disease and multiple combined therapies that incorporate chemotherapy or cytotoxic therapy that should be object of an individual evaluation according to risk/benefit to receive the vaccination. Cytotoxic chemotherapies interfere with DNA replication, synthesis and cell cycle progression. Lymphocytes proliferate rapidly as part of activation and so are suppressed by these therapies [4,5].

Malignant disease of the prostate has a different management than other solid tumors of the elderly where they do not frequently use Checkpoint inhibitors that incur a risk of immune-related adverse events (IRAEs). Today many cancer patients are included in clinical trials with different drugs combinations in development, this excludes them from their participation in the trials of current vaccines against COVID-19 in development worldwide, so the data on safety and the efficacy of these vaccines in cancer patients is very poor [6,7].

### Conclusion

Men with prostate cancer belong to the group of patients with the highest risk of serious disease and death from COVID-19, the prevention of contagion would be essential in this group of patients, so the decision to vaccinate them must be evaluated individually considering the risk-benefit according to international guidelines and recommendations for each group of patients and their immunological condition, treatment and the contraindications of each particular vaccine.

### Declaration of Interest

The author declare no conflict of interest that could be perceived as prejudicing the impartiality of the information's review.

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