

# Immuno Oncological Challenge of COVID-19

Somya Sharma, Sonali Choudhari Deshmukh\*

Department of Community Medicine, Jawaharlal Nehru Medical College, Datta Meghe Institute of Medical Sciences (Deemed to be University), Sawangi (Meghe), Maharashtra, India

## ABSTRACT

COVID-19 has shaken the world in an unprecedented way. It brought the whole world at a standstill mode. It started from Wuhan city in China and spread to almost all the countries in less than a year. It affected differently in different demography depending upon the mortality, comorbidities and the exposure to the virus of the Corona family. Though this virus has been a great threat to everyone irrespective of people's health, but the cancer patients has been one of the most vulnerable ones. Epidemiologic data recommend that drops eliminated during eye to eye transparency during talking, hacking, or wheezing is the most generally perceived strategy for transmission. Somewhat long receptiveness to a tainted individual being inside 6 feet for something like 15 minutes and briefer openings to individuals who are characteristic e.g. hacking are connected with higher risk for transmission, while brief openings to asymptomatic contacts are less disposed to achieve transmission. There were no effective and preventive measures available for quite a long time and only supportive and palliative interventions were available. It took very long to the medical researchers and scientists to come up with vaccines. Almost after two years vaccines were made available in the market. Even today there is no clarity about whether a cancer patient can take vaccine or not. If yes, then under what conditions and what are the precautions to be taken. This review aims at exploring the scope for cancer patients through articles and journals published about the immuno oncological challenges of COVID-19, how are the patients tackling it? How difficult has it been for the wards/families of the cancer patients?

**Key words:** COVID-19, Immuno, Cancer, Oncology, Vaccine, Mortality

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**Corresponding author:** Dr. Sonali Choudhari Deshmukh  
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## INTRODUCTION

Considering the fact that COVID-19 is a respiratory disease, people grappled with severe medical conditions like heart disease, lungs disease, diabetes and chronic disease like cancer have a very high risk of getting infected with severe forms of COVID-19. Studies have shown that one who has active or progressing cancer can be at higher risk than those whose cancer is in diminution state. It is extremely important for cancer patients to know how of the dos and don'ts of the COVID protocols and vaccination [1]. Exploring vulnerabilities produced by underlying boundaries to logical proof is regularly trying for some and the vast majority of individuals. It is really an inexcusable argument that the cancer patients were not systematically excluded from the clinical trials of the COVID-19 vaccines. Even though the cancer patients were kept on high priority category of vulnerability they were not given chance in trials. It is extremely urgent for cancer patients and other such vulnerable categories of patients

that efficacy and safety of vaccines is understood for these immune suppressed individuals, as regular negligence and exclusion of these vulnerable groups from COVID vaccine studies will amount to vague prognostic health models which in turn will badly affect the successive waves of COVID-19 [2].

COVID-19 is a highly contagious respiratory illness caused by Severe Acute Respiratory Syndrome Coronavirus-2 (SARS-CoV-2) and it is said that it has spread to people from creatures at one of the nearby market, which was well known for ocean bottom and meat, in Wuhan city of China. First and foremost it was expected that the infection will not send people [3]. Yet, later, it was observed that it is exceptionally infectious and can move starting with one human then onto the next. First and foremost, it spread among individuals in Wuhan which progressively spread to different pieces of China and soon to the vast majority of the nations. Very soon by December 2019, (WHO, 2019) declared it a pandemic and worldwide crisis. By December first seven day stretch of the 2021, authoritatively there has been 264,609,618 affirmed Coronavirus instances of which 5,253,114 individuals lost their lives and 238,626,255 have recuperated [4]. USA, India, Brazil, UK and Russia are the nations with most elevated affirmed cases at the same time. There are two sorts of Coronavirus, one indicative and the other

asymptomatic. In a nation like India with such a tremendous populace it has been undeniably challenging for state run administrations to deal with the circumstances and the cases enlisted are second most noteworthy on the planet.

The primary wave was horrendous for everybody. There was dread, nervousness and bunches of falsehood spread in the general public [5]. The falsehood about the sickness and helpless administration and handle of the Coronavirus took many lives in India. Impromptu lockdown and the occurrences which followed were horrendous, particularly for needy individuals. India saw the deadliest second wave in the entire world. There was ruin in the general public. Individuals kicked the bucket unprecedently in view of the Coronavirus. There were insufficient beds, no oxygen and no other clinical gear to save lives. In this wave there is scarcely any individual who has not lost an individual he/she has known [6].

### LITERATURE REVIEW

Patients with cancer are at risk for immune dysregulation related to underlying malignant disease as well as receipt of immune modulatory cancer therapy. The recent studies of 2021 state that there is a notable concern for patients with cancer that they may not build up a robust protective immune response to SARS-CoV-2 infection or may be even to the vaccination against it [7].

It was seen that the patients who were spoiled with harmful development disorder were seen as more weak against the SARS-CoV-2 defilement than another individual without the infection sickness not simply in light mature enough (taking into account that illness event is solidly associated with impelling age) yet also because of the great regularity of threatening development risk factors which are similarly associated with COVID. In an incredibly old examination of 2009 it was seen that smoking, irregularities associated with enrolled tomography check, metabolic issues like diabetes and hypertension might upset COVID. The vein hypertension, cardiomyopathy, accelerated cell senescence and central immunosuppression additionally extend the possibility getting COVID. Many reports from France, China and Italy suggest people with history of dangerous development disease were defenseless against COVID.

The affirmations suggest that such dangerous development, its stages and a couple of express medicines add to the risk factors for outrageous COVID among the illness patients. No other sickness patients are just similarly much defenseless as hematological, lung or chest harmful development patients. Dangerous development patients of chest and hematology have much higher potential outcomes getting hospitalized and death also. In another audit it was observed that since COVID is a disorder which gets the lung, the cell breakdown in the lungs patients has on various occasions the risk of death because of SARS-CoV-2 sickness. In one of the assessments, it was seen that pediatric patients with dangerous development were fairly impenetrable to

COVID and SARS pollution. The factors like age, weight and metabolic condition is moreover viewed as comorbidity that would affect shortcoming and earnestness of SARS-CoV-2 sickness. Poor ECOG execution and metastatic scattering status also favor COVID earnestness in illness patients [8].

The genotoxic chemotherapies which are administered to cancer patients ahead of SARS-CoV-2 infection eventually enhance its severity. In the same study it was also found that "Immuno senescence and inflammation, aging and obesity are some of the additional factor which promotes it, this declines the functions of immune systems which finally results in exacerbating overt inflammation and cancer dissemination and this in turn increases high risk to SARS-CoV-2 infectivity and have very high risk has chances of getting severe COVID-19".

### General direction on clinical consideration for patients with disease like cancer in Coronavirus pandemic

Patients with undermining improvement a huge piece of the time draw in with the clinical advantages design to look for therapy and strong idea for ailment similarly as treatment related intricacies. Telemedicine additionally help in confining the essential for in person advantages and lessening the danger of SARS-CoV-2 straight forwardness. CDC has passed on a structure to assist clinicians with wrapping up whether a patient ought to get very close or virtual idea during the Coronavirus pandemic; this development tends to factors, for example, the sensible mischief of conceded care and the level of SARS-CoV-2 transmission in a patient's neighborhood. Telemedicine may also cultivate consent to suppliers for helpfully or socially weak masses, yet it could smash aberrations in the event that these all inclusive communities have restricted enlistment to improvement. Nosocomial transmission of SARS-CoV-2 to patients and clinical thought laborers has been reported. Rules of physical wiping out and assumption draws near, including covering patients and clinical thought laborers and rehearsing hand neatness, apply to all very close investments [9].

Decisions about treatment regimens, operation and radiation therapy for the secret risk should be introduced on a safeguard by case reason and clinicians should consider the study of the sickness, the prerequisite for hospitalization, the amount of focus visits required and the normal degree of immunosuppression.

### Vaccination for Coronavirus in patients with cancer development

The clinical starters that evaluated the Coronavirus antibodies that have gotten crisis use approvals or possibly underwriting from the Food and medication organization (FDA) denied genuinely immune compromised patients. The warning panel on inoculation practices saw that the supported Coronavirus vaccinations are not live antibodies; along these lines, they can be safely controlled to immune compromised

people. Given the practicality of the Coronavirus antibodies in everybody and the extended peril of genuine Coronavirus and mortality in patients with dangerous development, the board recommends Coronavirus vaccination for patients with dynamic infection or patients who are seeking treatment for illness. Third piece of a mRNA inoculation for patients who are seeking dynamic harmful development therapy; this third part should be coordinated something like 28 days after the zenith of the basic two segment mRNA Coronavirus neutralizer series. Debris and NCCN have given additional recommendations to dealing with a third immunizer segment in patients with sickness considering the patient's disease type and therapy [10].

It is obscure whether the insusceptible reactions to Coronavirus immunization can expand the danger of unite versus have infection. Investigations of patients who got invulnerable designated spot inhibitors didn't report insusceptible related unfavorable occasions in these patients after immunization.

### **Should the patients with cancer treated on high priority basis**

The defenselessness of immune compromised cancer growth patients will get contaminated with flu infection was notable before the rise of CoV-2 (SARS-CoV-20). Flu expands the danger of medical clinic affirmation with serious respiratory pain by four times, with the danger of mortality by ten times when contrasted and patient is without threat. Information of disease patients having Coronavirus from fourteen distinct clinics in area of Hubei, China (focal point of Coronavirus episode) uncovered almost triple higher passing rate than that of Coronavirus patients without malignant growth. Patients with hematological danger, cellular breakdown in the lungs and stage IV harm had the most noteworthy seriousness [11].

### **Metabolic syndrome, cancer and COVID-19**

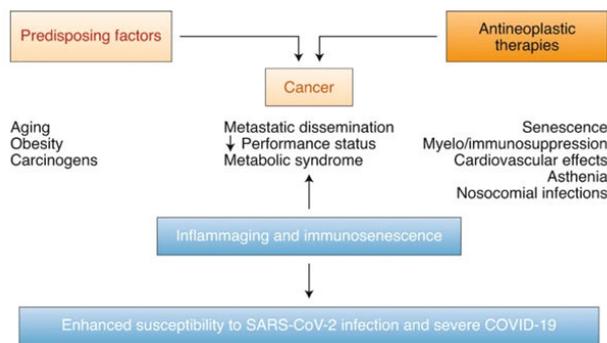
This investigates and meta examination of a few infections and the co-social examinations between them has achieved critical understandings how one sickness will influence other. In one more investigation of 2020 it was observed that the people who are extremely chubby, implying that the individual whose weight record  $\geq 40$  kg/m<sup>2</sup> and furthermore have type two diabetes have more possibilities getting disease of SARS-CoV-2 and they have a higher possibilities getting difficulties and passing from Coronavirus. The next year studies have shown significance among diabetes and these contaminations and it was presumed that insulin assumes a critical part in expanding digestion of the cancer and its development. The specialists have proposed that to alleviate the illness seriousness in stout it is essential to give insulin safe and execute the therapy of type two diabetes during Coronavirus [12].

## **DISCUSSION**

### **Immunosuppression, neutrophilia, lymphopenia and interferon deficiency**

The investigations have recommended that lymphocytes go about as reconnaissance and control the rate, movement of it and furthermore the recuperating reaction of malignant growths through their contribution in immune surveillance. Disrupting impact is a trademark gatekeeper part set off by the secured development against contamination or injury. Solid heightening grants the host to recover or change through cell and humoral responses, while certified aggravation prompts cytokine storms achieving tissue hurt. In this layout, we present the covering inevitable results of giving and taking progression agitating impact with contamination impacted bothering. The review supplements how facilitating drugs that kill unsafe improvement fuel may kill the bothering achieved by the viral infection. It is set up that the cytokine storm started by ideals of SARS-CoV-2 dirtying ads to sickness related mortality. While sabotaging headway remains the second among the issues related with mortality from one side of the world to the other, disease patients passing rates are regularly seen upon extended periods after illness, ordinarily going from months to years. Regardless, the passing rates related with COVID torment are liberal. The cytokine storm provoked by SARS-CoV-2 dirtying appeared, obviously, to be liable for the multi-organ disappointment and widened end rates. Since both hazardous new development and COVID tainting share covering burnable frameworks, reusing a couple anticancer and quieting drugs for COVID may slash down death rates. Here, we review a piece of these burnable parts and propose a couple of speculated that chemotherapeutic experts should mediate in them. We also examine the repercussions of quieting drugs, for instance, glucocorticoids and hydroxylchloroquine with zinc or antiviral arrangements, for instance, ivermectin and remdesivir against SARS-CoV-2 started cytokine storm. In this survey, we weight on various possible results to diminish SARS-CoV-2 induced cytokine storm. In a Chinese report it has happened that a race between cell resistant frameworks which mounts a reaction to kill infection tainted cells and the immunosuppressive activity of the microbe can decide the results of Coronavirus. For the clinical treatment of disease patients, COVID (SARS-CoV-2) can make authentic safe related issues. Hurtful advancement patients, who experience immunosuppression because of the pathogenesis and sincerity of illness, may turn out to be all the more impressive because of various components like age, comorbidities and immunosuppression. In this pandemic time, Coronavirus causes lymphopenia, undermining improvement cell animating, intensely hot illnesses and a cytokine storm that disaster areas infection related inauspiciousness and expectation. In a similar report it was additionally viewed that as in the event that an individual's insusceptible framework comes up short and can't deal with early popular replication and furthermore can't forestall endothelial injury, it might

prompt recognizable release of chemokins, cytokines and/alarmins (Figure 1) [13].



**Figure 1: Intertwined relationships between cancers and its comorbidities or therapies in relation to COVID-19 susceptibility.**

### Preventive measures

In one of the studies of 2020 it was found that “cardiovascular toxicities of cytotoxic agent counter balances the tumor control attained by oncological treatments, often this also brings hindrance in an effective therapy in patients or undermines the overall treatment and survival of the patients [14]. Bone marrow progenitors are stimulated by cytotoxic drugs administration through ablative or non-myeloablative dosages, this also stimulates both mature and immature cells.

Theoretically, the side effects of cancer treatment complicate the prognostication of COVID-19. There is no proper research and evidence which suggests that COVID-19 and cancer can be treated parallel and medicines of both the disease will work simultaneously. The researchers are still trying to figure out a way, until then for a cancer patient prevention is the only best option available. The better cure is better and in time diagnosis of the disease [15].

### CONCLUSION

The COVID-19 is a disease which causes congestion in lungs and seizes the air passages to various parts of the body and causes death too quickly. The cancer treatment and side effects of it doesn't let the immune of a person grow and reduces the body's immune drastically making it vulnerable to many other diseases. People with comorbidity are more prone to catch COVID-19 and cancer is one of the most deadly diseases making its patients most vulnerable to COVID-19. The research suggests that the association between cancer, the factors which causes it and the other associated diseases makes the patients more vulnerable to COVID-19. The vulnerability of the cancer patients towards the COVID-19 depend on the types of cancer they have got.

The research and trials of vaccination have also been biased towards the cancer patients; they were not included in any of the trials. No governments in any country took any significant initiative towards the

vaccination or treatment of cancer patients against COVID-19 may be because they have had this idea in their head that anyway they are dyeing and it's better to focus on a healthy citizen rather than a person who might be a liability and won't prove to be beneficial. The deliberate exclusion either in fear or anxiety is not good for a large number of cancer patients.

There is need for more and more research and investment in studying what would be the way for a cancer patient if caught COVID-19. A better and profound research and development accompanied with technology is the only hope for the cancer patients. As a saying goes 'prevention is better than cure' is what seems to be the only hope for time being for a cancer patient to protect himself/herself from COVID-19.

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