



COVID-19 Vaccine Safety in Cancer Patients: A Single Center Experience

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Abstract: *Introduction:* During the COVID pandemic and in front of the anguish of patients with cancer in a totally gloomy atmosphere, in front of their worries and the confusion of some patients but also of some colleagues not specialists in oncology, the medical oncology department of the Hospital Establishment DIDOUCHE Mourad, Constantine, launched a vaccination campaign for eligible patients, during the vaccination campaign initiated by the Ministry of Health. *Materials and Methods:* Faced with the risk of contracting the severe form of COVID-19 in patients with cancer, immunocompromised by the disease, by the treatments received or to be received but also living in an environment not spared by the COVID-19 infection, the team of the medical oncology department thought of this type of patients and developed a well-established vaccination protocol for patients with cancer. This vaccination protocol respected all barrier measures while taking certain precautions to eliminate patients who would be carriers of an asymptomatic COVID-19 infection or whose symptoms would be like oncology emergencies. *Results:* Without any obligation and after informed and approved consent by the patient, the vaccination lasted five days and saw significant patient adherence. Out of 379 patients who came to the department during these five days, 201 patients agreed to be vaccinated, representing a percentage of 53.03% and only 180 patients (47.49%) were vaccinated (due to lack of sufficient quantity of vaccines at our level during these five days and the high adherence of patients), against 8.97% of refusal (34 patients). The remaining patients (37.9%) had either absolute or non-absolute contraindications to vaccination or had contracted a recent COVID infection; delaying the vaccination to 3 months. Only one side effect (0.55%) was noted; that of hypoglycemia in a patient who presented on an empty stomach to the ward. All these patients (100%) agreed to be vaccinated in the oncology department and refused to join the vaccination site opened within the establishment because of a relationship of trust - security established between patients-attending physicians. *Conclusion:* Medical work department and preventive epidemiology services should continue to vaccinate health personnel and the population; eligible respectively but the category of eligible patients (which is no longer an eligible person but an eligible patient); and especially patients with chronic diseases should be cared for in treatment's centers according to patients' choices.

Keywords: Vaccination, COVID-19, Cancer, Patients, Eligible, Trust, Safety

1. Introduction

Patients with cancer are at higher risk of having an infection in general and a COVID infection in particular. This is due to the deficiency of the immune system by the disease, itself, but also by the treatments received, a disturbed diet but also to the associated comorbidities [1]. The risk of infection in relation to disease and immunosuppression may be temporary and corrected at the end of treatment or after a period of adaptation and supportive care [2]; and each individual responds according to his system and his ability to rectify the situation. However, and depending on a certain type of cancer, some cancers can also be responsible for compensating the immune system allowing germs and infections to set in. These infections are of different types and individualize according to risk factors. For this reason and in order to prevent the consequences of these infections, treatment is usually initiated well in order to prevent the risk involved.

Fever, sweating, coughing, pain and others are the symptoms of infection present [3] and are treated with great caution in a patient with cancer and constitute oncology emergencies.

The infection caused by SARS-CoV-2 and responsible for the COVID-19 pandemic with symptoms almost similar to oncology emergencies, represents one of the most dangerous and feared infections in oncology in general and oncology in particular [4].

After sanctuarization of the care departments for patients with cancer since the beginning of the pandemic and in front of the significant spread of the infection throughout the entourage of patients and with the arrival of vaccines developed around the world to counter this infection or reduce its aggressiveness [5]; especially in an immunocompromised population category, a vaccination campaign was launched in a medical oncology department in Constantine; capital of Eastern Algeria. This campaign follows the one launched by the Algerian Ministry of Health but is specific for cancer patients.

2. Material and Methods

2.1. Material

In order to homogenize the campaign launched in the medical oncology department to all patients; all types of cancer combined, an examination was followed with these different questions which were intended to be an orientation but also an awareness of the patients and why not their entourage.

This interrogation included:

1. Wish or no vaccination.
2. Search for co-morbidities associated with cancer.
3. Search for associated fever for at least 5 days.
4. Search for recent COVID-19 infection for less than 3 months; documented by the RT-PCR test.
5. Search for associated vaccination \ for less than 14 days.
6. Search for associated allergy.
7. Search for an associated treatment (type: immunosuppression, corticosteroid therapy, antiplatelet agent or anticoagulant).

8. Search for an associated pregnancy or recent breastfeeding.

9. Informed signature if vaccination acceptance.

A vaccination follow-up protocol has been established according to this approach:

1. Reception at the level of the medical oncology department:
 - a. Compliance with barrier measures (systematic wearing of masks, distancing, hand washing (gel or soapy water).
 - b. Routine antigen test (immunocompromised patients) and/or RT-PCR as appropriate.
 - c. New patients: explanation-information-awareness.
 - d. If vaccination agreement: informed consent to present to patients and then follow-up of the patient's circuit to be vaccinated.
 - e. If no vaccination agreement: circuit of the patient to be taken care of in oncology.
 - f. Preparation of a room dedicated to vaccination.
2. Circuit of the patient to be vaccinated:
 - a. If the patient has had a recent COVID-19 infection, postpone vaccination after 3 months.
 - b. Conditioning.
 - c. Taking biological and hemodynamic constants: TA, SPaO₂, Fc, T0.
 - d. Detailed examination.
 - e. Rest.
 - f. Psychological preparation for vaccination.
 - g. Preparation of the vaccine according to established recommendations.
 - h. Vaccination of the patient.
 - i. Administration of the vaccine intramuscularly at the deltoid muscle.
 - j. Onlooking during and after vaccination for at least 30 minutes.
 - k. Scheduling of the appointment of the 2nd dose.
 - l. Release of the patient with contact information.
 - m. Postponement of chemotherapy sessions (after one week).
3. Staff supporting vaccination:
 - a. Medical personnel assigned to medical oncology (all ranks).
 - b. Paramedical staff (ISP) assigned to medical oncology.
 - c. Medical psychologist.
4. Logistics:
 - a. Collection of data on a local register Data: Surname-First name, Address, Telephone, pathology presented, date of 1st and 2nd injection.
 - b. Collection of any side effects related to vaccination on the patient's card.
 - c. Transmission of the data of the vaccinated person to SEMEP.
 - d. Registration of the vaccination act by SEMEP on the dedicated register.
 - e. Specialized management of patients to be vaccinated.
 - f. New patients: starting with vaccination before any specialized treatment.
 - g. Patients undergoing treatment.

- i. If systemic treatment: postpone treatment and vaccinate patients in inter cures, with the exception of patients on anti - CD19 or anti - CD20 where vaccination should be done 03 to 06 months after the end or discontinuation of treatment.
- ii. If treatment with hormone therapy: Vaccinate patients on the day of their consultation (no deadline to be respected).
- iii. Patients in remission: Vaccinate patients on the day of their consultation (no deadline to be respected).

Parents or companions of cancer patients are considered psychological support for patients and can be vaccinated (to serve as an example) at the same time by SEMEP depending on the availability of vaccination teams.

This campaign was presented to the health department of Constantine's city for prior approval, with support and insurance of logistics: local registry, vaccines against COVID-19.

Several vaccines were available and the choice fell on the "SINOVAC" because it seemed to be devoid of major side effects for this type of population to be vaccinated as well as at the request of patients who had also inquired about the safety of the vaccine.

This vaccine, being the most used in Algeria was available at the launch of the vaccination campaign. This vaccine; produced by the pharmaceutical company Sinovac, located in Beijing, is an inactivated vaccine. Due to its ease of storage, it is very simple to manage. According to data provided by the manufacturer, the SINOVAC-CoronaVac vaccine has an efficacy rate of 51% against symptomatic infection [6]-[8]. It is also 100% effective against hospitalizations and severe forms of the disease [9]. Widespread use of a COVID-19 vaccine with an efficacy rate of at least 50% will help control the pandemic effectively [10].

2.2. Methods

During five (05) days of medical oncology consultations (as of September 2021; September 8–9–11–12 and 13), 379 patients were enrolled in the study.

This population of patients eligible to vaccinate was

compared to a population of patients wanting to be vaccinated (in the absence of vaccines), studied over 05 additional days; or 395 patients were studied.

A total of 774 patients were followed.

The main objective of the study is to define the rate of adherence to a vaccination campaign in a treatment department after the vaccination campaign launched by the Ministry of Health.

The secondary objective is to decrease the rate of occurrence of severe COVID-19 infection in cancer patients and to protect this population as well as define the refusal rate in a population of immunocompromised patients.

3. Results

379 cancer patients were included in the study of adherence to a vaccination campaign launched in a treatment department; after the one launched by the Ministry of Health. 121 (67.22%) patients were women and 59 (32.77%) patients were men. Different tumor localizations were noted.

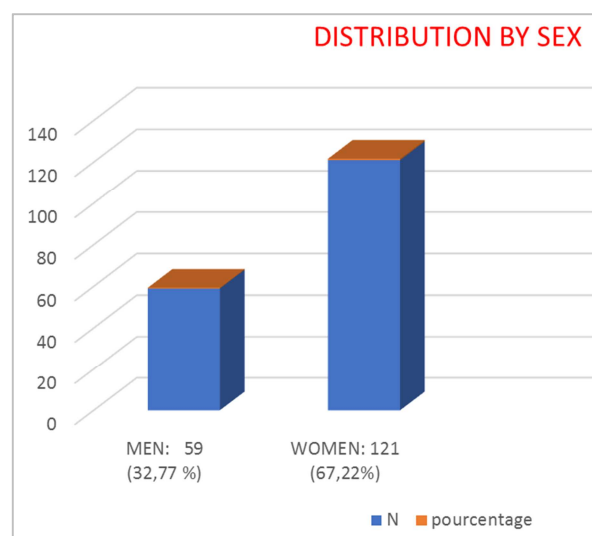


Figure 1. DISTRIBUTION by Sex.

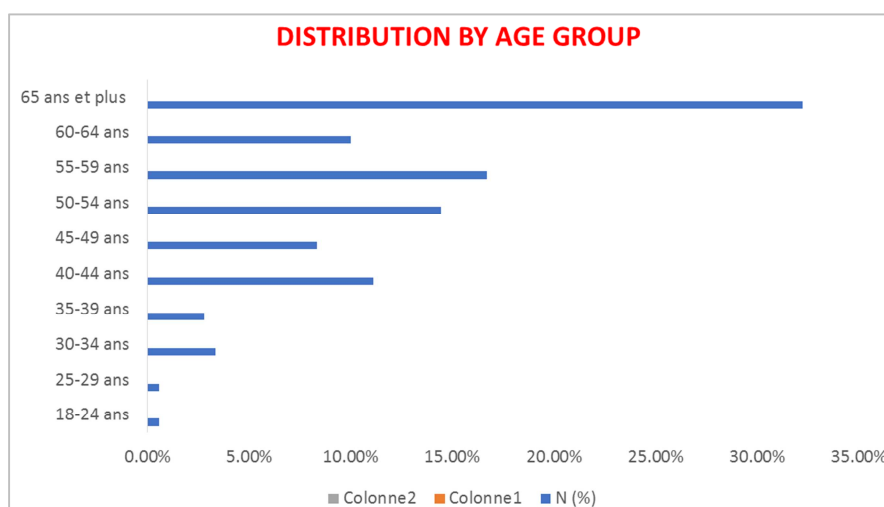


Figure 2. Distribution by Age-Group.

The characteristics by age group and sex are as follows:

Table 1. Characteristics by age, group and sex.

Age range	Women Total	Men Total	TOTAL
18-24 years old	1		1
25-29 years old		1	1
30-34 years old	5	1	6
35-39 years old	5		5
40-44 years old	16	4	20
45-49 years old	11	4	15
50-54 years old	21	5	26
55-59 years old	22	8	30
60-64 years old	13	5	18
65 years & more	27	31	58
TOTAL	121	59	180

Table 2. Tumor types of the vaccinated patient population.

Tumor Type	N	%
Breast	73	40.56
Colo-rectal	35	19.44
Lung	9	5
Prostate	8	4.44
Gastric	7	3.88
Pancreas	7	3.88
Ovary	6	3.33
Bladder	4	2.22
Gall bladder and Cholangiocarcinoma	4	2.22
Others (Endometer, LNH, UCNT, Glioblastoma, Larynx, Thymoma, Cutaneous tumor)	27	15

42 (11.08%) were already vaccinated, 34 (8.97%) patients refused the idea of vaccination, 4 (1.05%) hesitated and 32 (8.44%) patients did not want to comment yet at the time of the consultation and preferred to continue their treatments. 34 (8.97%) patients had the notion of recent COVID. 18 (4.74%) were postponed of which 13 (72.22%) were tired following recent chemotherapy, 1 (5.55%) for recent surgery, 1 (5.55%) for febrile neutropenia, 3 (16.66%) for oral chemotherapy not yet stopped. 12 (3.16%) patients had contraindications to vaccination including 2 (16.66%) on long-term corticosteroid therapy, 1 (8.33%) rheumatoid arthritis on treatment, 1 (8.33%) tuberculosis, 2 (16.66%) minors, 4 (33.33%) on treatment with Rituximab, 1 (8.33%) notion of allergic terrain, 1 (8.33%) recent ischemic stroke (less than 20 days), 1 (0.26%) patient had a positive antigen test. 201 (53.03%) expressed a wish to be vaccinated and only 180 (47.49%) were vaccinated and 21 (5.54%) patients were unable to receive vaccines (due to lack of quantity on the last day of the study). Only 1 patient (0.55%) had a side effect such as hypoglycemia-hypotension because she presented on an empty stomach to the ward. Only 1 (0.26%) patient accepted vaccination outside the medical oncology department.

In parallel, the study was continued (without much conviction and with less enthusiasm) over five additional days with 395 patients of whom 22 (5.56%) were already vaccinated, 44 (11.13%) refused vaccination, 16 (4.05%) patients had recent COVID, and 68 patients (17.21%) expressed the wish to be vaccinated but 100% of them wanted to be vaccinated in the oncology treatment department and refused to travel at the vaccinating center of the epidemiology

and preventive medicine department within the establishment (SEMEP). 2 (0.95%) patients were vaccinated in SEMEP. 27 (6.83%) patients were deferred for fatigue following recent chemotherapy or scheduled surgery or non-infectious lung disease. 5 (1.26%) had a contraindication and were on long-term corticosteroid therapy or had stroke or heart disease. 174 (44.05%) patients did not comment and wanted to continue chemotherapy.

Table 3. Status of vaccinated population.

	PATIENTS: n (%)
Already vaccinated	42 (11.08)
Refusal of vaccination	34 (8.97)
Hesitation	4 (1.05)
Without pronouncement	32 (8.44)
COVID récent	34 (8.97)
Deferred vaccination	18 (4.74)
Fatigue after recent chemotherapy	-13 (72,22)
Recent surgery	-1 (5,55)
Febril neutropenia	-1 (5,55)
CT in progress	-3 (16,66)
Contraindications	(3,16)
Corticotherapy	-2 (16,66)
PR under treatment	-1 (8,33)
Tuberculosis	-1 (8,33)
Minor	-2 (16,66)
Treatment by Rituximab ongoing	-4 (33,33)
Allergic ground	-1 (8,33)
Recent ischemic VIA	-1 (8,33)
Positive Antigenic Test	1 (0,26)
Hope of vaccination	201 (53,03)
Real Vaccination	-180 (47,49)
Lack of vaccine	-21 (5,54)
SEMEP' vaccination	1 (0,26)
TOTAL	379 (100%)

CT: chemotherapy, PR: purpura rhumatoïde, VIA: vascular Ischemic accident, SEMEP: Service d'épidémiologie et de médecine préventive.

4. Discussion

During the vaccination campaign on a population of patients presenting to the medical oncology department, it should be noted that patients preferred to be vaccinated in their place of treatment because of a relationship of trust and assurance established since the beginning of management of their disease; between patient and attending physician. Some patients; 49 (12.92%) have already tried to get vaccinated elsewhere [11], found difficulties and showed feelings of fear towards this vaccination because the vaccination teams; apart from the attending physicians' oncologists, apprehend the care of this type of patients [12].

Vaccination rate; 47.49% in this population (eliminating those who did not have access to the vaccine by lack during the last day and those delayed for side effects of chemotherapy) is considered among the highest rates and concerns an immunocompromised population whose drug treatment must be taken into consideration during this campaign [13]. The 2nd population studied during the absence of vaccines within the service was not approached with the same impetus and enthusiasm as the 1st population for fear of wanting to accept

vaccination to immunocompromised patients [14] without being able to provide logistics (vaccines) and which would have resulted in the loss of the feeling of trust that linked patients to treating physicians [15]. In summary, and if vaccination had been continued (and according to the experience conducted over a period of ten (10) days), the actual vaccination rate would have been 41.08%; i.e., 318 patients among the 774 patients presenting to the medical oncology department and studied over a period of 10 days [16]. Patients who hesitated or who had a delayed vaccination for reasons of fatigue or other, all expressed the wish to be vaccinated within the department. Patients already vaccinated were 64 patients (8.26%) [17]. Those who refused vaccination were 10.07% (78 patients). 26.61% (206 patients) did not express an opinion and wanted to continue their drug treatment in oncology [18] without interruption [19]. 50 (6.45%) patients had a recent COVID-19 infection [20] and 18 patients (2.32%) had a contraindication to vaccination. Only 3 patients (0.38%) agreed to be vaccinated outside the oncology department [21]; during the period when the vaccine was missing at the department [22].

5. Conclusion

The involvement of the various specialists; each in its field, is more than necessary for the success of a vaccination campaign during a pandemic such as the COVID-19 pandemic. The feeling of fear and apprehension of patients is quickly lifted when patients-subjects eligible for vaccination are cared for in treatment centers where the relationship of trust is essential for the largest possible adherence [23]. This work should be continued to achieve the triple objective of a vaccination strategy during a pandemic, which consists in reducing mortality and the onset of severe forms of the disease, protecting patients and caregivers and thus preserving the health care system and finally guaranteeing the safety of vaccines and vaccination in a population of immunocompromised patients while preserving free and free and free of charge. The consent of patients after information-awareness without any obligation whose essential message is to be vaccinated against SARS-CoV-2.

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