Recommendation for COVID-19 vaccination in patients with hematological cancer

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Worldwide, the number of people infected by the new coronavirus SARS-CoV-2 continues to increase. After the first outbreak in March 2020, incidence has temporarily decreased, but increase again since the end of July reaching its peak in December 2020 [1].

Rapidly developed vaccines are promising, whilst their availability is limited for now. In order to prioritize access to licensed vaccines, regulations are made at national levels. Increasingly, registration data for vaccines is becoming available (Table 1).

Table 1: COVID-19 Vaccines Submitted to EMA (as of Dec 31, 2020)

Developer Trial identifier	Mode of Action	Vaccination scheme	Control	Vaccine	N=	Efficacy Number of infections per group	Efficacy Number of hospitalized COVID-19 per group
BioNTech/Pfizer C4591001 [2]	mRNA + LNP	Day 0, 21	Placebo	BNT162b2 2x30 µg, 21 days apart	43.548	95.0% 162 vs 8	9 vs 1
Moderna COVE [3]	mRNA + LNP	Day 0, 28	Placebo	mRNA-1273 2x100 µg, 28 days apart	30.000	94.1% 185 vs 11	30 vs 0
AstraZeneca Oxford COV002, COV003 [4]	Vector-based	Day 0, 28	Placebo	AZD1222 LD 2.5x10^{10} VP SD 5x10^{10} VP	11.636	Overall 70.4% 101 vs 30 LD/SD 90.0% 30 vs 3 SD/SD 62.1% 71 vs 27	10 vs 0

LD, low dose; LNP, lipid-nanoparticles; Overall, overall vaccine efficacy across both groups; SD, standard dose; VP, viral particles

In the BNT162b2 study, volunteers >16 years of age were included. Patients with a history of COVID-19, immunosuppressive disease or immunosuppressive treatment were excluded. Thus only 3% of participants had a patient history of malignant disease, and study results can only be extrapolated to hematology patients. A local reaction at the injection site emerged as the most common side effect. Pain was reported by 83% of patients <55 years after first injection and by 78% after second injection. In older patients the rate of injection site pain was lower (71 and 66%, respectively). Most common systemic reactions were fatigue (59%) and headache (51%). Fever >38°C occurred in 16% of younger patients and in 11% of older patients. Serious adverse events of CTCAE grade 3 were fatigue (3.8%) and headache (2.0%).

During routine application of BNT162b2, severe anaphylactic reactions were reported. Both patients had a corresponding history and were equipped with an epinephrine pen.

These data show that the mRNA-based vaccines have high efficacy. Serious adverse events are rare. Long-term results are not yet available. However, mRNA-based vaccines have been tested in cancer patients for almost 10 years without raising concerns in terms of safety [5].

Our recommendations for the COVID-19 vaccination must equally take patients and health care workers (HCW) into consideration. Based on current knowledge we propose:

- Vaccination is intended for those with an increased risk of infection, those with an increased risk of a severe course of COVID-19, those with an increased risk of mortality, and their close contacts. These include:
    - Patients with malignant hematologic diseases, particularly acute and chronic leukemia, malignant lymphoma and multiple myeloma;
    - HCW in direct contact with hematology patients.
- Principles of shared decision making between treating hematologist and patient apply in the individual decisions on COVID-19 vaccination.
- In immunosuppressed patients, protection prevailed by the COVID-19 vaccination may be lower. In patients after B-cell depletion or HSCT we encourage to keep an interval of 3-6 months in analogy to other vaccinations.
- In patients with a history of anaphylactic reactions, the risk of a severe side effect should be weighed carefully against the expected benefit.

The database on tolerance and efficacy of COVID-19 vaccination in hematologic cancer patients is growing rapidly. This continuous production of knowledge may lead to short-term modifications of current recommendations.

References

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