Vaccination of patients with haematological malignancies

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Disease entity-specific vaccination strategies

Live vaccines are contraindicated in the immunocompromised patient .

Inactivated, nonconjugated vaccines may not induce sufficient antibody production.

Live vaccines

Live vaccines, e.g. against MMR, yellow fever and varicella, are generally contraindicated

During chemotherapy

Including maintenance therapy with monoclonal antibodies

Live vaccines

LAVs should also be avoided during therapy and 6 months from the end of chemotherapy because of the potential risk and scarcity of safety data.

should be performed >24 months after completion of therapy and along serostatus.

influenza vaccine

Influenza increases morbidity and mortality in cancer patients.

Therefore, all patients >6months with leukemia should be vaccinated annually against influenza .

Patients receiving rituximab should receive the vaccine 6 months after therapy because of poor immune response .

Live-attenuated influenza vaccine cannot be recommended

Influnza vaccine

immune-response to single shot vaccination in patients with hematologic malignancies is often impaired .

A second vaccination against influenza seems reasonable, but can only be recommended with weak evidence and the optimal timing remains unclear.

suggest improved effectiveness when administering the vaccination directly after a cycle of chemotherapy rather than shortly before the next cycle

Influnza vaccine

Optimal timing of vaccination for patients being treated for cancer is not established, but serologic responses may be best between chemotherapy cycles:

7 days after the last treatment) or

2 weeks before chemotherapy starts

Antipneumococcal vaccination

Patients should receive antipneumococcal vaccination before treatment .

The conjugated 13-valent vaccine PCV13 should be administered first; if a patient has not received prior antipneumococcal vaccination, he should be revaccinated with polysaccharide vaccine PPSV23 8 weeks later.

3–6 months after the end of chemotherapy patients should be vaccinated.

Meningococcal vaccine

persistent complement deficiencies

patients taking eculizumab

or those at increased risk from serogroup B meningococcal disease outbreak(Candidates with asplenia, college students, and military personnel)

HiB vaccine

Immunization against HiB is only recommended for adults after SCT

DTP vaccine

Protection against diphtheria, tetanus and pertussis (DTP) is impaired in these patients

We therefore recommend a DTP booster immunization for these patients.

They should be vaccinated before starting treatment and after end of therapy if the immune system is reconstituted .

HPV vaccine

Patients with lymphoma are at increased risk of HPV associated cancer, especially after pelvic irradiation.

HPV vaccine, should be provided 3–6 months after the end of chemotherapy according to age and country recommendations.

If vaccination against human papilloma virus (HPV) is indicated, vaccination should be performed regardless of immunosuppression; however, immune-response might be reduced

Hepatitis vaccine

In countries with high HBV prevalence where a high risk of HBV transmission during chemotherapy exists, HBV vaccination starting before and continuing during chemotherapy can be administered .

3–6 months after the end of chemotherapy, patients vaccinated according to age and country recommendations.

Solid tumors

Influnza vaccine

All adult solid tumor patients should receive yearly vaccination with inactivated influenza vaccine.

Second administration of influenza vaccine in cancer patients as this increased seroconversion from 44% to 73% , but further investigations are needed.

It was recently shown that cancer patients can be vaccinated independent of chemotherapy and simultaneous administration vaccination and chemotherapy is possible

RECOMMENDED VACCINATION SCHEDULE AFTER AUTOLOGOUS OR ALLOGENEIC HCT[jj]

Inactivated, Subunit, or Toxoid Vaccines	Recommended Timing After HCT	Number of Doses
DTaP (Diphtheria/Tetanus/Acellular Pertussis)	6–12 months	3
Haemophilus influenzae type b (Hib)	6–12 months	3
Pneumococcal vaccination • Conjugated 13-valent vaccine (PCV13) • Upon completion of PCV13 series, then PPSV23	 6–12 months ≥12 months	 3 1
Hepatitis A[kk] (Hep A)	6–12 months	2
Hepatitis B[kk] (Hep B)	6–12 months	2–3[mm]
Meningococcal conjugate vaccine[ll]	6–12 months	2–3[mm]
Influenza (injectable)	4–6 months	1, annually
Inactivated Polio vaccine	6–12 months	3
Recombinant zoster vaccine[nn]	50–70 days after autologous HCT May be considered after allogeneic HCT[nn]	2
Human papillomavirus (HPV) vaccine	>6–12 months For patients up to age 26, consider up to age 45	3

Live Vaccines[oo]	Recommended Timing After HCT	Number of Doses
Measles/Mumps/Rubella (MMR)	≥24 months	1–2
Varicella vaccine	≥24 months (if no GVHD or ongoing immunosuppression and patient was seronegative for varicella pretransplant)	2

Indications for Adult Pneumococcal Vaccination

Indications:

PPSV-23 Alone	Both PCV-13 and PPSV-23
Patients 19-64 years with ≥1 choronic condition below:	**All patients ≥65 years**
Cigarette smoking	**Patients 19-64 years with ≥1 immunocompromising condition below:**
Chronic heart disease (CHF, cardiomyopathy)	Cerebrospinal fluid leak
Chronic lung disease (asthma, COPD)	Cochlear implant
Diabetes mellitus	Congenital or acquired immunodeficiency
Alcoholism	HIV infection
Chronic liver disease (cirrhosis)	Functional or anatomic asplenia
Reside in nursing home or long-term care facility	Chronic renal failure or nephronic syndrome
	Malignancy
	Solid organ transplant
	Immunosuppression (glucocorticoids, radiation)

Vaccination Timing:

Pneumococcal vaccine-naive persons aged ≥65 years

PCV13 → (≥1 year) → PPSV23

Persons who previously received PPSV23 at age ≥65 years

PPSV23 already received at age ≥65 yr → (≥1 year) → PCV13

Perosns who previously received PPSV-23 before age 65 years who are now age ≥ 65 years

PPSV23 received at age <65 yr → (≥1 year) → PCV13 → (≥1 year) → PPSV23

(≥5 years)

Pneumococcal vaccine-naive persons aged 19-64 years with ≥1 immunocompromising condition

PCV13 → (≥8 weeks) → PPSV23 → (≥5 years) → 2nd dose PPSV23 prior to age 65 yr

Persons aged 19-64 years with ≥1 immunocompromising condition who previously received PPSV-23

1st dose PPSV23 → (≥1 year) → PCV13 → (≥8 weeks) → PPSV23

(≥5 years)

Pneumococcal vaccine-naive persons aged 19-64 years with ≥1 chronic conditions

PPSV23

Family members of cancer patients

close family members or contact persons should be evaluated for their current vaccination status and possibly be (re)vaccinated.

Special attention is required in patients with small children, as some live-attenuated childhood vaccines may bear risks for chemotherapy recipients. For instance, Rota-virus vaccination is strongly discouraged in family members of cancer patients

Recommendations for vaccination of health-care workers in a haematology ward

Hospital haematology staff should receive IIV annually .

They should additionally be vaccinated according to country and hospital guidelines.

Caregivers who are seronegative for measles or varicella-zoster virus should be vaccinated.

In case of a rash post varicella-zoster virus vaccine, they should avoid contact with patients until resolution.

Thank You!