Türk Hematoloji Derneği

54.Yıl

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Hematoloji'de aşılama

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EKMUD Aşılama rehberi

4.1.2.1. Akut myeloblastik lösemi hastalarında;

- İntensif kemoterapi alan hastalara tedavi sonunda bir doz inaktif influenza aşısı yapılmalıdır.
- Ülkemiz Hepatit B açısından yüksek riskli ülkeler arasında olduğu için tedavi öncesinde başlanıp, tedavi devamında da aşılamaya devam edilebilir.
- Pnömokok ve difteri tetanoz aşıları öncelikli olarak mümkünse tedaviden 2 hafta önce yapılmalıdır.
- Tedavi bitiminden 3-6 ay sonrasında rutin sağlıklı aşılama sürecine başlanabilir.

4.1.2.2. Kronik myeloproliferatif hastalıklar grubunda;

- Bcrabl/scr inhibitörü ve ruksolitinib kullanan hastalara influenza ve pnömokok aşısı yapılmalıdır.
- Canlı aşı özellikle ruksolitinib kullanan hastalarda verilmemelidir.

EKMUD Aşılama rehberi

Tablo 6. Miyelom, lenfoma ve kronik lenfositer lösemi hastalarında önerilen aşılar

Aşı	Zamanlama
Pnömokok PCV veya PPSV23	Tanı , idame ya da plato fazında
İnfluenza	Yıllık
Hepatit B	Antikor titrelerine bakılarak tanıda veya tedavi öncesi çift doz Tedavi sonrası 0,1,6.aylarda
HPV	Sağlıklı bireylerdekine benzer şekilde

Myeloproliferatif hastalıklar

	Inactivated influenza vaccine	Pneumococcal vaccines	Other inactivated vaccines	Comments
AML and MDS	At the end of intensive chemotherapy in patients with AML or MDS, a single dose is recommended yearly as long as the patient is considered immunocompromised (B II u)	3–6 months after the end of chemotherapy, patients with AML or MDS should be (re) vaccinated according to age and country recommendations	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 (C II u). 3–6 months after the end of chemotherapy, patients with AML or MDS should be (re) vaccinated according to age and country recommendations	Patients with MDS who do not receive any specific treatment should have their vaccine programme revised according to age and country recommendations
CML	Patients with CML should receive one dose yearly (B II u)	Patients with CML should be vaccinated against *Streptococcus pneumoniae* (C II t). Although there are no data on the response to PCV, it is recommended to give one dose of PCV followed 2 months later by one dose of PPSV23	According to age and country recommendation	The expected response rate during dasatinib or bosutinib treatment might be lower than with the other tyrosine kinase inhibitors
Other chronic myeloproliferative neoplasms	According to age and country recommendation	According to age and country recommendation	According to age and country recommendation	There are no data on the vaccine response under ruxolitinib

Mikulska M,Lancet 2019

Lenfoproliferatif hastalıklar

	Inactivated influenza vaccine	Pneumococcal vaccines	Other inactivated vaccines	Comments
Multiple myeloma	Yearly vaccination (one dose) is strongly recommended (A II u) as long as the patient is considered immunocompromised	One dose of PCV13 followed by one dose of PPSV23, at least 8 weeks later, is recommended (B II u), preferably before treatment or during maintenance	Other inactive vaccines should be considered 3-6 months after the end of treatment, according to age, comorbidities, and country recommendations	LAVs are contra-indicated until at least 3 months after the end of chemotherapy (D III)
Lymphoma	Yearly vaccination (one dose) is strongly recommended (A II u) as long as the patient is considered immunocompromised, except in patients receiving intensive chemotherapy or who are receiving or have received anti-CD20 antibodies in the previous 6 months	One dose of PCV13 followed by one dose of PPSV23, at least 8 weeks later, is recommended (B II t), preferably before treatment or during maintenance, except in patients who are receiving high-dose chemotherapy or who are receiving or have received anti-CD20 antibodies in the previous 6 months	Human papillomavirus vaccine is recommended in healthy adolescents and young adults according to country recommendations for age after the end of treatment (B II t). Other inactive vaccines should be considered 3–6 months after the end of treatment, according to age, comorbidities, and country recommendations	In patients who are receiving or have received anti-CD20 antibodies in the previous 6 months, any inactivated vaccine should be delayed for at least 6 months after the last dose (B II u for IIV). LAVs are contra-indicated until at least 3 months after the end of chemotherapy (D III)
Chronic lymphocytic leukaemia	Same recommendation as for lymphoma patients	One dose of PCV13 followed by one dose of PPSV23, at least 8 weeks later, are recommended (B II u), preferably before treatment	Same recommendation as for lymphoma patients	Same recommendation as for lymphoma patients. Novel drugs might significantly impair the vaccination response

Mikulska M,Lancet 2019

Hematolojik malignensilerde COVID aşısı

EUROPEAN HEMATOLOGY ASSOCIATION

- 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.

11 March 2021

Delaying second vaccine dose leaves cancer patients vulnerable to virus

More than half of cancer patients receiving a single dose of the Pfizer COVID-19 vaccine have been left with little protection against the virus.

- *Anti-SARS-CoV-2 antibody responses at week 3 following the first dose of the vaccine were only 39% and 13% in the solid and haematological cancers, compared to 97% in those without cancer.*
- *2nd dose at week 3 → 95% response in 2 weeks*
- *No 2nd dose at week3 → 43% of solid cancer patients and 8% of blood cancer patients developing antibodies to the Pfizer vaccine at five weeks compared to 100% of healthy controls.*

Hayday A,MedRvix 2021

COVID aşı
-güvenlik-

Anaflaksi:

- Pfizer/Biontech→4.7 vaka/milyon
- Moderna /NIH →2.5 vaka/milyon

Transvers myelitis ve hemolitik anemi

- Oxford/Astra Zeneca

Biri diğerine üsün mü?

- **mRNA ile daha güçlü immun cevap**
- **Varyantlara etkinlik önemli**

Moderna

B 1.1.17 için benzer etkinlik

BB.1351; 501Y.V2 için azalmış nötrölzasyon

Astra Zeneca

B 1.1.17 için benzer etkinlikB

B.1351; 501Y.V2 için direnç

Ne zaman?

- **EBMT:**

✓ Nakil sonrası 3.ayda başlanabilir mümkünse 6.aya kadar bekenmeli

✓ Nakil öncesi yapılmamalı

- **BRITISH:**

✓ Fhem otolog hem allojeneik nakil sorasında 2-6.aydan sonra

Kimde ertelenebilir

- <16yaş
- Akut GVHH grade III – IV.
- Kronik GVHH
- anti-CD20 son 6 ay içinde
- Inotuzumab, blinatumomab
- ATG veya alemtuzumab. Kullanan hastalar

EBMT COVID vaccination recomendations

Öneriler…

- Daha önce enfeksiyon öyküsünden bağımsız olarak önerilir
- Pozitif antikor titresi korumayabilir
- İnfluenza ve pnömokok ile arada 14 gün olmalıdır
- Vericilere hücre toplamadan önce aşılama sonrası 3-7 gün bekelenir.

HEMATOPOİETİK KÖK HÜCRE NAKLİ HASTALARI

Pneumococcal vaccine

ECIL

PCV13:-Starting posttransplant 3rd month,3 doses PCV13 at 1 month interval
-In case of Chronic GVHD fourth dose PCV13, 6 months after the third dose instead of PPSV23
PPSV23:-At 12 th month of transplantation.

ASBMT

-3 doses PCV starting at 3-6 months post- transplant and a minimum of 4 weeks apart
-4th dose of PCV13 (if patient still has GVHD/on immune suppression) or a dose of PPSV23 is given to complete a series of 4 vaccines

FRED HUTCHINSON

-6/8/10th month PCV,1 dose at 18th month if GVHD
-PPSV23 at 18th month if no dose cGVHD

Influenza vaccine

ECIL

- From posttransplant 6 months,annually at the beginning of flu season
- After the first years following transplant, and at least until 6 months after stopping any immunosuppressor and as long as the patient is judged to be immunocompromised r life—long

- Second dose→3-4 weeks after the first one ;in patients with severe GvHD or low lymphocyte counts (B II r); in the setting of a community outbreak,
- If performed at 3rd month→second dose may be beneficial

ASBMT:

- Annually starting at 4-6 months

Hemophilus influenza

E CIL

- From 3 months after transplant 3 doses at 1-month intervals
- No preference on the type of vaccine (conjugated with tetanus-protein or diphtheria-protein).

or

- 3 doses of a combined diphtheria-tetanus-pertussis-Hib vaccine from 6 months after the transplantation

ASBMT

- 3 doses starting 6-12 months

FRED HUTCHINSON:

- At 6/8/10 th months

Tetanus/diphteria/pertussis

ECIL

- From 6 months after the transplant 3 doses at 1–2-month intervals
- DT vaccines should be preferred over Td vaccines both in children and adults

ASBMT:

- 3 doses starting at 6-12 months DTaP if possible, otherwise Tdap (1) and Td (2)

FRED HUTCHINSON

- 1 dose Tdap at 12 months
  2 doses of Td at 14/16 months

Meningococ

ECIL

- From 6 months after transplantation at least two doses of either a monovalent or tetravalent C vaccine and meningococcal B vaccine
- Country recommendations for a given age and particularly for at-risk groups such as students living in campus, travellers, or soldiers
- Children and adeloscents are main risk groups.

ASBMT:

- 1 dose starting at 6-12 months

FRED HUTCHINSON:

- 2 doses at 6/8 months
  (2 doses of meningococcal group B vaccine at 10/12 months with ana- tomic or functional asplenia (ie, cGVHD) or " environmental risk

Polio

ECIL

- From 6 to 12 months: 3 doses at 1–2-month intervals
- Children <10 years , booster may be needed due to the loss of antibody titres

ASBMT

3 doses at 6-12 months

FRED HUTCHINSON

12/14/16 mnths

Hepatitis B

ECIL

- 6 months after transplantation for patients ;

-who were negative for HBV before transplantation

-who were vaccinated before transplant but lost their immunity at 6 months

- 3 doses should be administered 0, 1, and 6 months apart

- Patients infected with HBV before HSCT (HBsAg negative and anti-HBc positive) ; asses regularly for anti-HBs antibody titres and vaccinate if they have unprotective titres (<10 mIU/mL)

ASBMT

3 doses starting at 6-12 months

FRED HUTCHINSON

12 /14/16 months

HPV

ECIL

- 6–12 months after transplantation
- recommendations for the general population in each country

FRED HUTCHINSON:

Age 9-45→3 doses 12/14/18 month

Live vaccines
MMR/Varicella

EBMT

- Contraindicated until 24 th month
- no GvHD, no immunosuppression, no relapse of the underlying disease, and treatment with immunoglobulins during the previous 3 months.
- MMR,Varicella zoster should be performed;2 doses in children
- Zoster live vaccine is not recommended.

FRED HUTCHINSON:

- Recombinant zoster vaccine:
- Allogeneic>50 years seropositive pts,2 dose 2-6 month
- Autologous>18 years seropositive pts,2 dose, 1-2 month

EKMUD aşılama rehberi

Tablo 7. İnaktive aşılar (12.aydan önce aşılamaya başlanması uygun ise)

Aşı	≥3 ay	≥8 ay	≥10 ay	≥12 ay	≥14 ay	≥16 ay	≥18 ay	≥24 ay	≥30 ay	Aşılanmalar arası minimum zaman aralığı
Influenza(inaktiveaşı) (Eylül-Mart)	Influenza									
H. Influenza Tip B	HIB	HIB	HIB	titreler				Titreler		1-2 ay
Menenjit	MCV4									
Pnömokok-Konjuge	PCV13	PCV13	PCV13							1-2 ay
Pnömokok-Polisakkarit							PCV13 veya PPSV23 *1			
Çocuk Felci (inaktive edilmiş)				IPV	IPV	IPV				
Hepatit A				HAV			HAV			6 ay
Hepatit B				HBV	HBV		HBV	Titreler *4		2 ay
HPV				HPV	HPV		HPV			2 ay sonra ilk; 4 ay sonra 2. doz
Asellüler Boğmaca-Tetanoz-Difteri				Tdap	Td	Td		Titreler *2		1-2 ay

1: Polisakkarid aşıya yanıt vermesi beklenmeyen kronik graft versus host hastalığı olan hastalara, konjuge aşı (PCV13)'ın dördüncü dozu uygulanabilir.
2: Anti-tetanoz toksoid titresini kontrol ediniz.
3: Kombine aşı kullanmak fayda sağlayabilir.
4: Titre 20 ayda tamamlanmadıysa 24 ayı kullanınız. Üçüncü doz aşılamadan 1-2 ay sonra antikor oluşumu kontrolü için. Hepatit B yüzeyel antijen testi önerilir. Birincil aşı serisine yanıt vermeyen hastalara ikinci bir üç dozluk aşı serisi uygulanır. Bağışıklık sistemi baskılanmış olan yada hemodiyaliz hastalarına, yüksek doz (40 mcg doz) hepatit B aşılaması önerilir.
5: İnaktive edilmiş ölü virüs aşılaması yapılabilmesi için, son IVIG dozunun üzerinden en az 2 ay geçmesi gerekir.

EKMUD aşılama rehberi

Tablo 8. İnaktive edilmiş aşılar (12. aydan önce aşılama yapılmayacak ise)

Aşı	≥12 ay	≥14 ay	≥16 ay	≥18 ay	≥22 ay	≥24 ay	≥30 ay	Aşılanmalar arası minimum zaman aralığı
Influenza (inaktive edilmiş) (Eylül-Mart)	Influenza							
H.influenza tip B	HIB	HIB	HIB			Titreler		1-2 ay
Menenjit				MCV4				
Pnömokok-Konjuge	PCV13	PCV13	PCV13					1-2 ay
Pnömokok-Polisakkarit						PCV13 veya polisakkarit *1		
Çocuk Felci (inaktive edilmiş)	IPV	IPV	IPV					
Hepatit A	HAV			HAV				6 ay
Hepatit B	HBV	HBV		HBV		Titreler *4		2 ay
HPV		HPV		HPV	HPV			2 ay sonra ilk; 4 ay sonra 2. Doz

Other vaccinations for donors

- Donors should be vaccinated for influenza.
- Inactivated vaccines should be given at least 2 weeks before stem cell collection.
- Live vaccines are contraindicated 4 weeks before stem cell collection.