

Kök Hücre Mobilizasyon Rejimleri

Namık Yaşar ÖZBEK
Sağlık Bilimleri Üniversitesi
Ankara Çocuk Sağlığı ve Hastalıkları
Hematoloji-Onkoloji SUAM



Kök hücre mobilizasyon rejimleri

Otolog kök hücre mobilizasyonu

Verici kemik iliğinden kök hücre mobilizasyonu

Vericiden periferik kök hücre mobilizasyonu

Otolog mobilizasyon rejimleri

- **Büyüme faktörleri**

- ✓ **G-CSF**

- **Kemoterapi**

- ✓ **Hastalık rejimi**

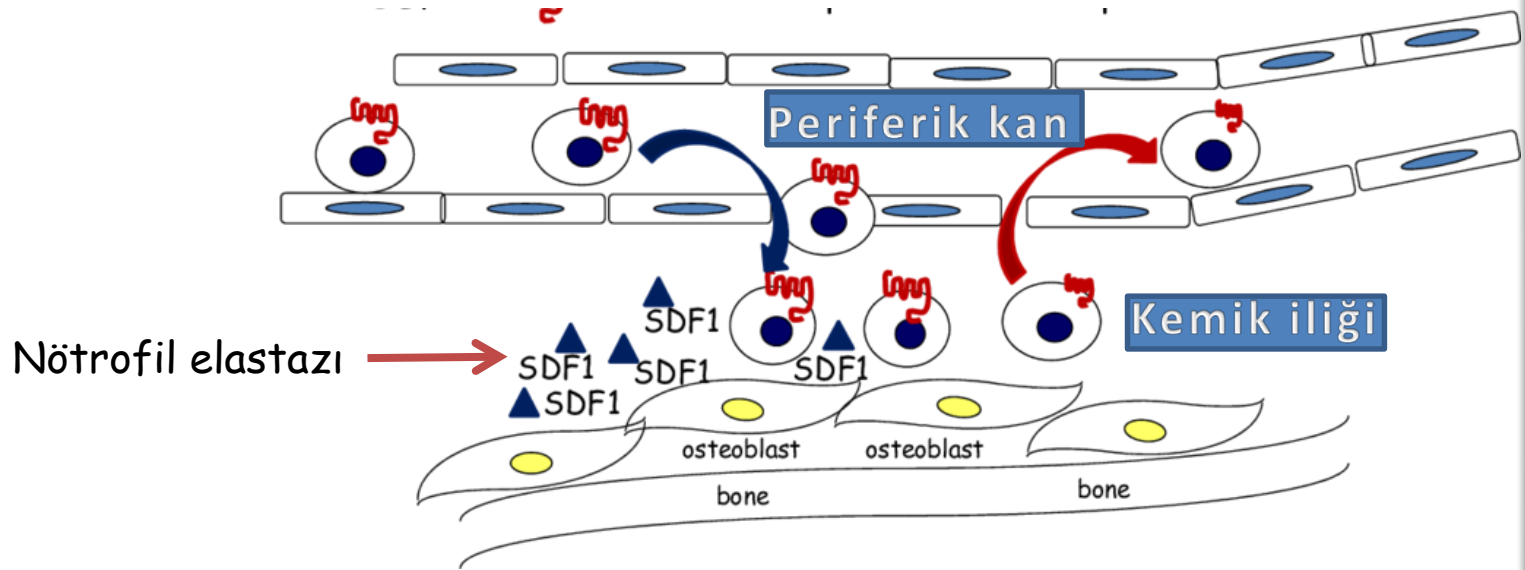
- ✓ **Siklofosfamid**



- **Plerixafor**

G-CSF ile periferik KH mobilizasyonu

- Kemik iliğinde SDF 1 azalır → 5. günde maksimum
- Nötrofil elastazı artar → SDF 1/CXCR4 ilişkisini keser



Nature Immunol 2002;3:687.

G-CSF ile PKH mobilizasyonu



- ✓ Daha az invazif
- ✓ Genellikle 1, en fazla 3 kez mobilizasyon
- ✓ Kİ veya kord kanına göre daha iyi ve hızlı engrafman
- ✓ Daha hızlı lenfosit rekonstitüsüyonu

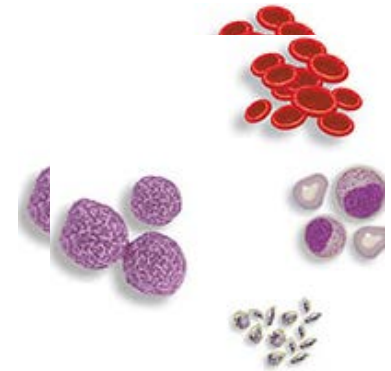


- ✓ Daha düşük rejimle ilişkili mortalite
- ✓ Allojeneik nakillerde GvHH riski daha çok

Curr Opin Hematol 2008;15:285.

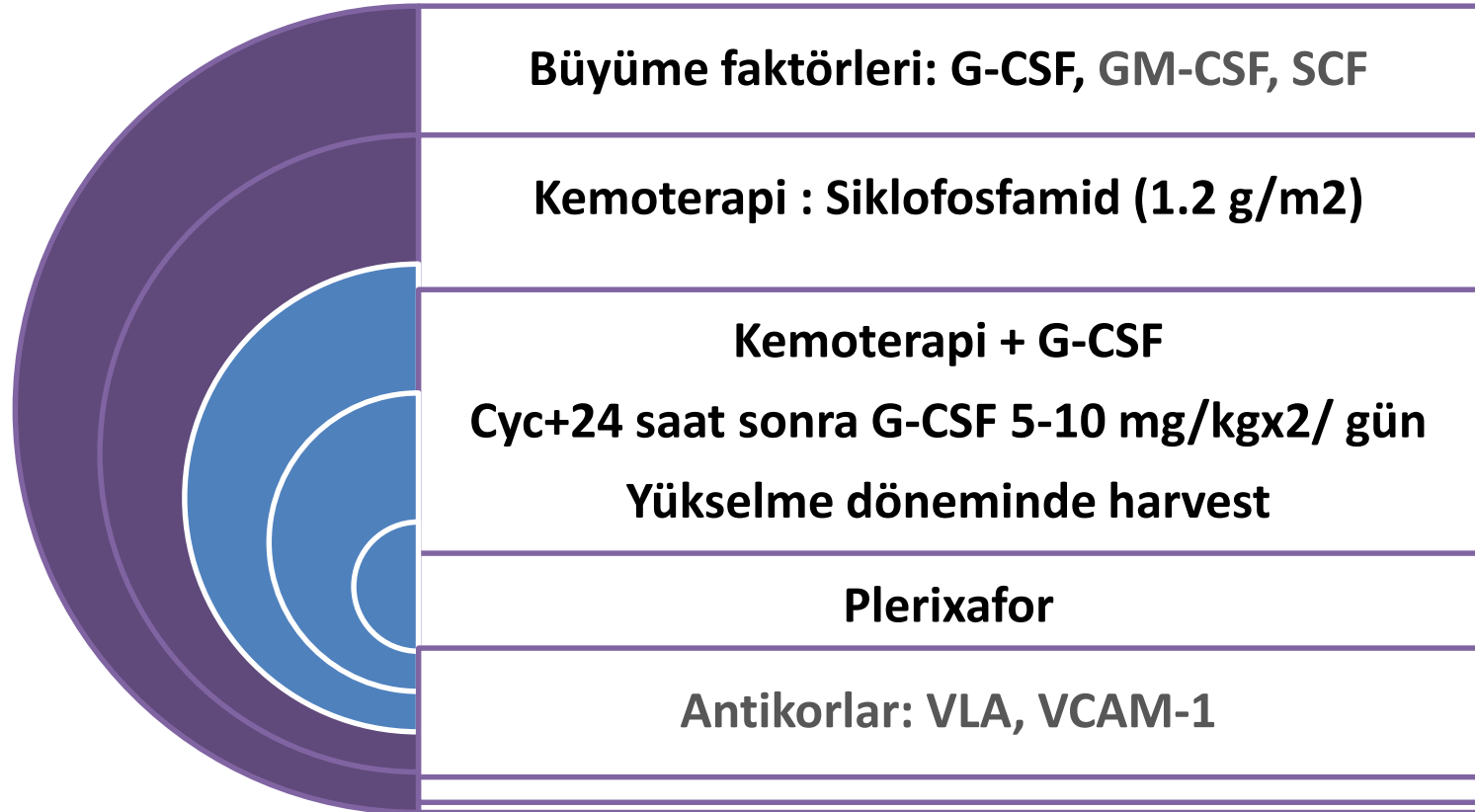
G-CSF ile zayıf mobilizasyon

- Hastaların ¼'ünde izlenir
 - ✓ Lenfomalar
 - ✓ Ağır tedavi almış hastalar → Relaps, Rb, sarkomlar
- Sağlıklı vericilerin %10-20'sinde



Curr Opin Hematol 2008;15:285.

Periferik mobilizasyon rejimleri



Otolog KH mobilizasyonu

- Genellikle kemoterapi sonrası toparlanma evresinde
- Gerekirse G-CSF yardımı → kemoterapi sonrası 5-10 mcg/kg/gün
- 5-20 hücre/ml → 10 hücre olması optimal
- İşlem öncesi
 - Hb normal sınırlarda
 - Platelet sayısı > 40-50 bin
- Yetersiz ürün durumunda plerixafor



Bone Marrow Transplant 2008;41:159.

Nöroblastomda KH mobilizasyonu

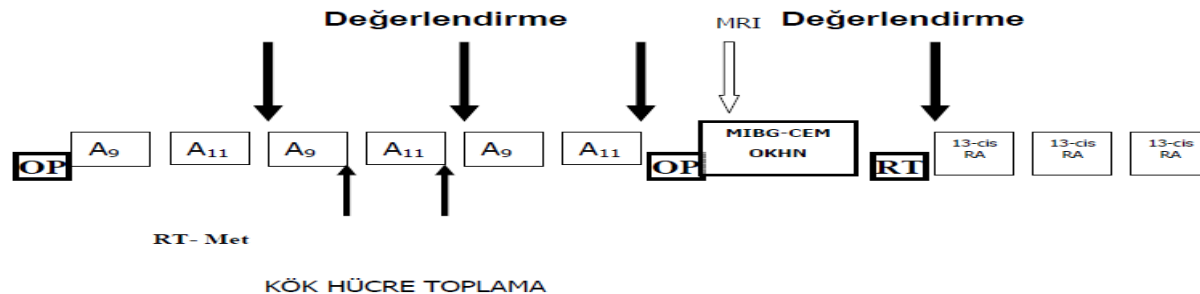
- **Evre IV nöroblastomda uygulanır**
 - Kemosensitif, 3-5 yıllık survival düşük
 - Kök hücre kurtarma ile yüksek doz kemoterapi mümkün
- **Periferik KH mobilizasyonu**
 - Daha kolay uygulanabilir
 - Tümör kontaminasyonu yok
 - Nakil sonrası iyileşme hızlı



Bone Marrow Transplant 2008;41:159.

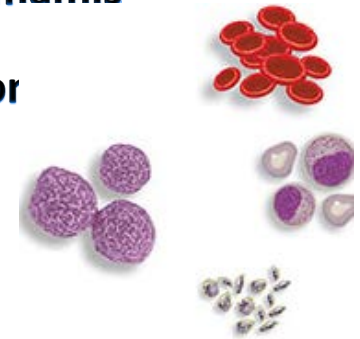
Nöroblastomda KH mobilizasyonu

- Genelde 3 blok tedavi sonrası
- Kİ temizlendiğine emin olunmalı → «in vivo purging»
- 3. kür öncesi Kİ aspirasyonla değerlendirilebilir
- 3. kür sonrası ve gerekirse 4-5. kür sonrası toplama



Nöroblastomda KH mobilizasyonu

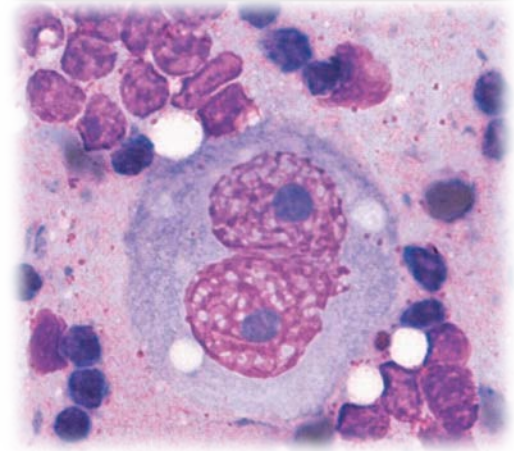
- KH toplama işlemi tüm otolog nakillerde zahmetli
 - Kateter sorunu: Çift lümenli sert kateter
 - Alet ölü hacmi: Priming
- Temizleme (purging) → Magnetik boncuk yardımıyla
 - NB hücrelerinde CD34 ekspresyonu? → Kanıtlanamamıs
 - CD34+ kök hücre seleksiyonu / NB hücre seleksiyon
- 1-5 (2.5 TPOG önerisi) x 10⁶ CD34+ hücre yeterli
- Fazla kalan hücre saklanabilir



Bone Marrow Transplant 2008;41:159.

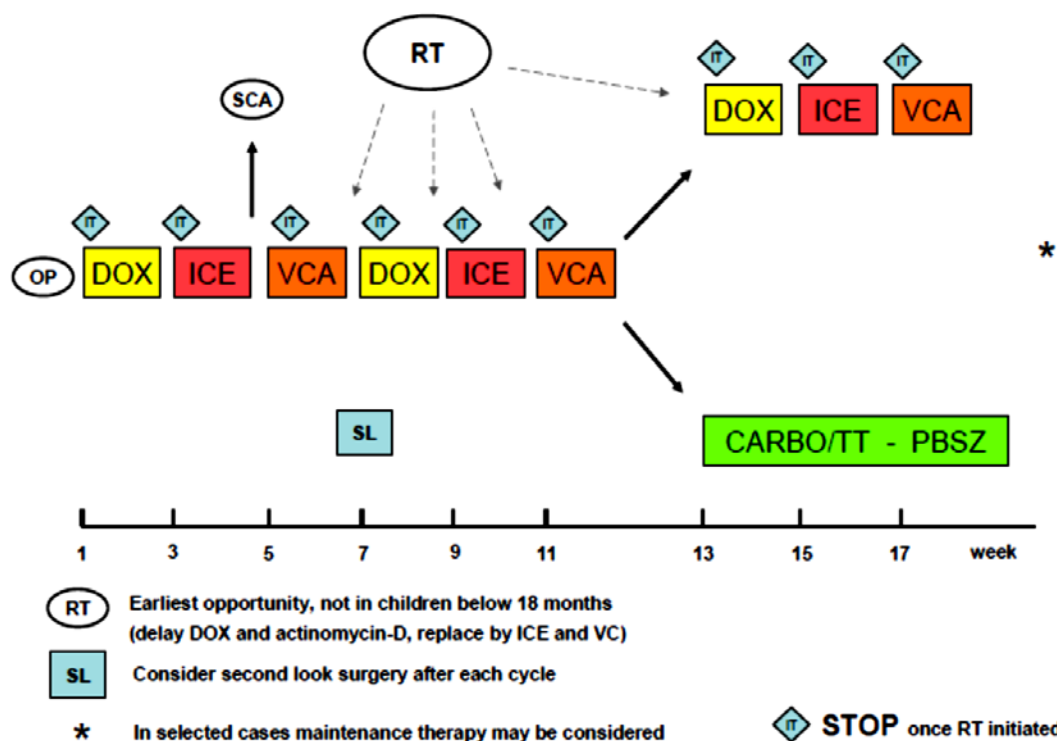
Hodgkin lenfomada KH mobilizasyonu

- ICE sonrası yapılır
- Kİ temizlenmiş olmalıdır
- G-CSF gerekliyse
 - KT'den 24 saat sonra başlanır
 - 2x5 mg/kg, genelde 8-10 gün
 - Günlük kan sayımıyla yönlendirilir
 - CD34+ hücre de sayılabilir



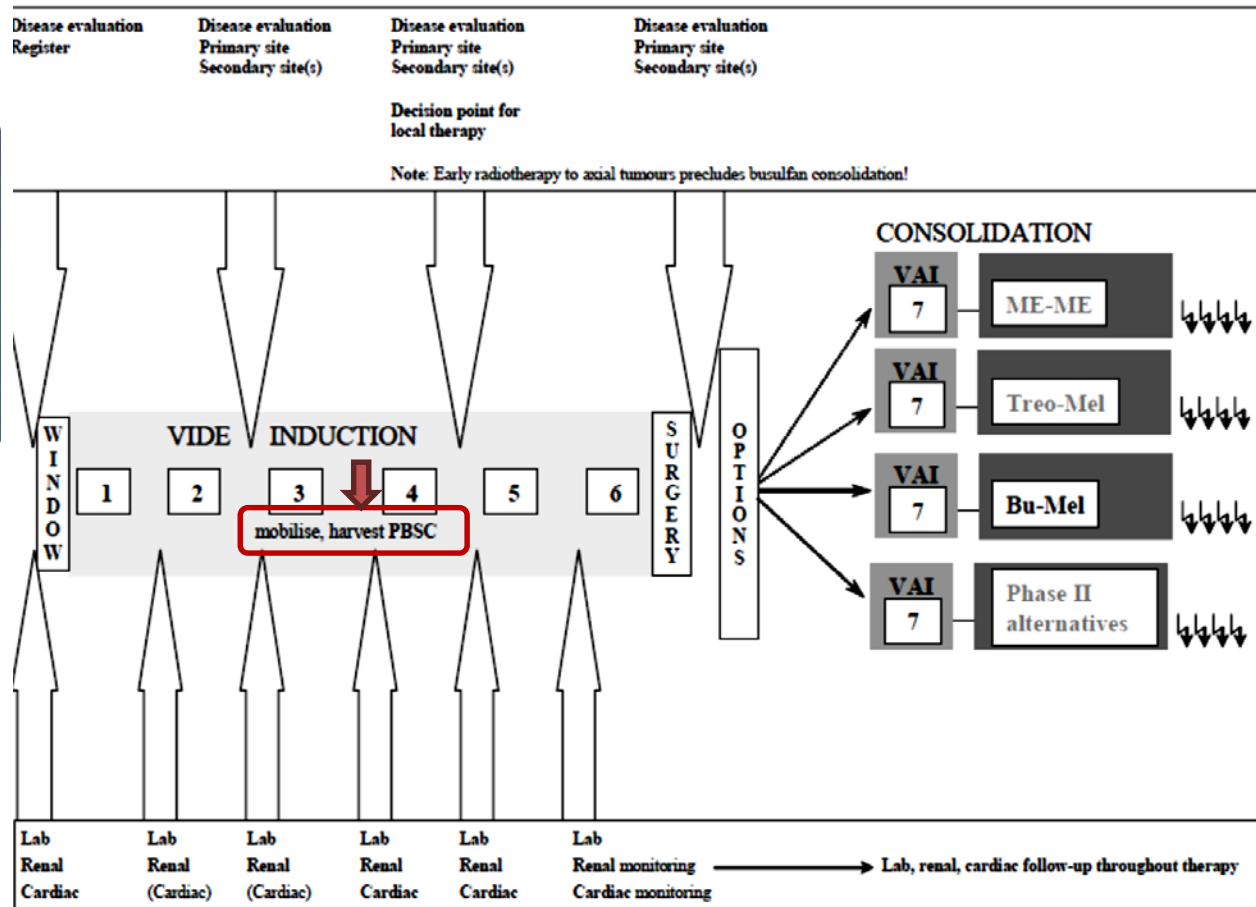
Malign rabdoid tümör/ATRT'de KH mobilizasyonu

IV.6.1 AT/RT (<18 months)



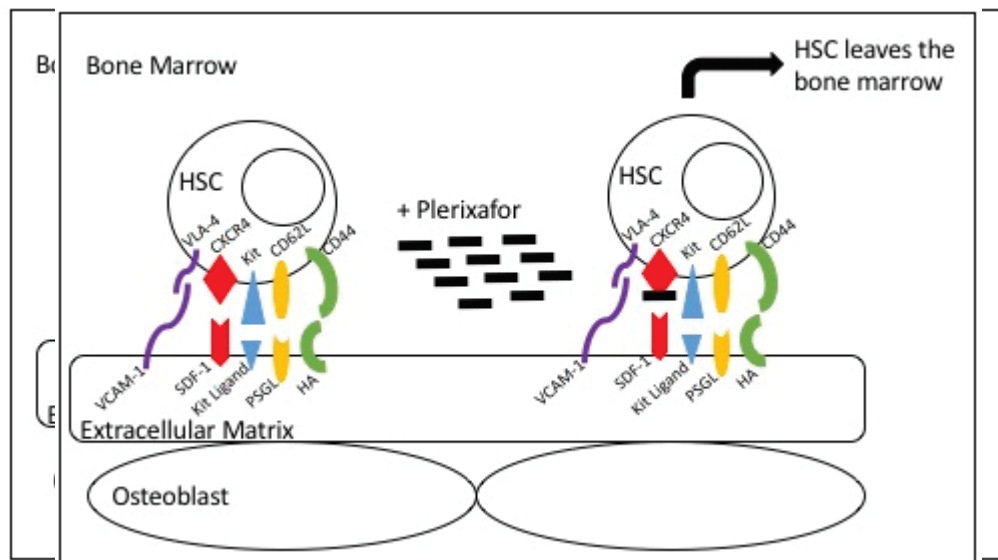
Ewing sarkomda KH mobilizasyonu

VIDE
Vinkristin
ifosfamid
Doxorubicin
Etoposid



Plerixafor

- G-CSF → SDF 1↓ + Elastaz ↑ (CXCR4 < SDF1)
- Plerixafor → CXCR4 antagonisti
- G-CSF + Plerixafor birlikte kullanılabilir



Use of plerixafor for peripheral blood stem cell mobilization failure in children



Suna Emir^{a,*}, Hacı Ahmet Demir^a, Tekin Aksu^b, Abdurrahman Kara^c, Meltem Özgüner^d, Bahattin Tunç^a

Transfusion and Apheresis Science 50 (2014) 214–218

Patient characteristics.

Characteristic	Patient 1	Patient 2	Patient 3
Age	9	9	14
Sex	M	M	M
Diagnosis	Ewing sarcoma	Hodgkin lymphoma	Hodgkin lymphoma
Months since diagnosis	23	28	60
Prior chemotherapy Number of cycles	4 course NCI, 12 course ICE, 5 course irinotecan + temozolomide	6 course ABVD 4 course ICE	3 course ABVD 6 course COPP 4 course ICE
Prior radiotherapy	5580 cGy neck	2400 cGy neck 2700 cGy abdominal	1800 cGy neck 1800 mediastinal and abdominal

Mobilization characteristics.

P	1st line mobilization	CD34 (μl)	CD3 yield	2nd line mobilization × days	CD34 (μl)	CD34 yield × 10 ⁶ /kg
1	G-CSF + CT 10 mcg/kg × 10 (2 course)	2.77	Failed	Plerixafor 240 mcg/kg × 1 G-CSF 10 mcg/kg × 10 Plerixafor 240 mcg/kg × 3 G-CSF 10 mcg/kg × 14 Plerixafor 240 mcg/kg × 1 G-CSF 10 mcg/kg × 14 (without chemotherapy)	5.67 10.3 26	0.5 Failed 1.26 Failed 4.1
2	G-CSF + CT 10 mcg/kg × 15 (1 course)		Failed	Plerixafor 240 mcg/kg × 1 G-CSF 10 mcg/kg × 14 Plerixafor 240 mcg/kg × 2 G-CSF 10 mcg/kg × 5 (without chemotherapy) Plerixafor 240 mcg/kg × 3 G-CSF 10 mcg/kg × 9, G-CSF 20 mcg/kg × 5	14 3.33 17.34 14.53	1 Failed Failed 1.86 1.53
3	G-CSF + CT 10 mcg/kg × 12 (2 course)		Failed	Plerixafor 240 mcg/kg × 2 G-CSF 10 mcg/kg × 5 (without chemotherapy)	30.16	4.9

Plerixafor is safe and efficacious for mobilization of peripheral blood stem cells in pediatric patients

TRANSFUSION 2016;56;1402–1405

Ashley Teusink,¹ Susan Pinkard,² Stella Davies,³ Mark Mueller,³ and Sonata Jodele³

- Plerixafor alan 16 hasta
- Hedef CD34+ hücre sayısı $1.5 \times 10^6/\text{kg}$
- En az 5 gün 10-20 mcg/kg G-CSF ile başarı yok (CD34+ < 10)
- Doz 0.24 mg/kg → Toplamadan 10-11 saat önce
- Çoğu hastada 2-4 kez plerixafor G-CSF ile birlikte uygulanmış
- Herhangi bir yan etki yok

Plerixafor is safe and efficacious for mobilization of peripheral blood stem cells in pediatric patients

TRANSFUSION 2016;56;1402–1405

Ashley Teusink,¹ Susan Pinkard,² Stella Davies,³ Mark Mueller,³ and Sonata Jodele³

TABLE 1. Demographics and treatment characteristics

Patient	Age (years)	Sex	Weight (kg)	Diagnosis	Indication for PBSC harvest	Number of plerixafor doses used	CD34+ cells collected ($\times 10^6/\text{kg}$)	Harvest goal met (yes or no)
1	4.7	Female	19.4	Nbl	Relapsed disease	4	4.7	Yes
2	4.5	Male	17.8	Nbl	Relapsed disease	4	2.65	Yes
3	8.0	Male	20.2	Nbl	Relapsed disease	3	5.7	Yes
4	10.0	Female	22.1	Nbl	Relapsed disease	2	0.2	No
5	6.2	Male	18.8	Nbl	Relapsed disease	3	3.3	Yes
6	3.5	Female	17.4	PNET	Multiple transplants	3	0.7	No
7	5.2	Female	17.4	PNET	Multiple transplants	3	9	Yes
8	15.4	Female	19.6	EWS	Relapsed disease	2	6.4	Yes
9	5.4	Male	26.9	Wilms	Relapsed disease	1	12.4	Yes
10	6.4	Female	19	Wilms	Relapsed disease	1	8	Yes
11	11.7	Female	45.5	CCSK	Relapsed disease	2	1.9	Yes
12	14.4	Male	42.9	MB	Multiple transplants	1	7.4	Yes
13	4.2	Male	13.1	Nbl	Relapsed disease	4	1.6	Yes
14	0.7	Male	9.8	RB	Relapsed disease	2	7.3	Yes
15	6.3	Male	16	Wilms	Relapsed disease	2	8.6	Yes
16	11	Female	20	NGGCT	Relapsed disease	2	3.4	Yes

CCSK = clear cell sarcoma of the kidney; MB = medulloblastoma; Nbl = neuroblastoma; NGGCT = nongerminomatous germ cell tumor of the brain; PNET = primitive neuroectodermal tumor (brain); RB = rhabdoid tumor of kidney; Wilms = Wilms' tumor.

Allojeneik Ki toplama

- Uyarı yapmaksızın
 - ✓ Alıcı/verici kilo uyumu

- Büyüme faktörleriyle uyarılmış Ki
 - ✓ G-CSF



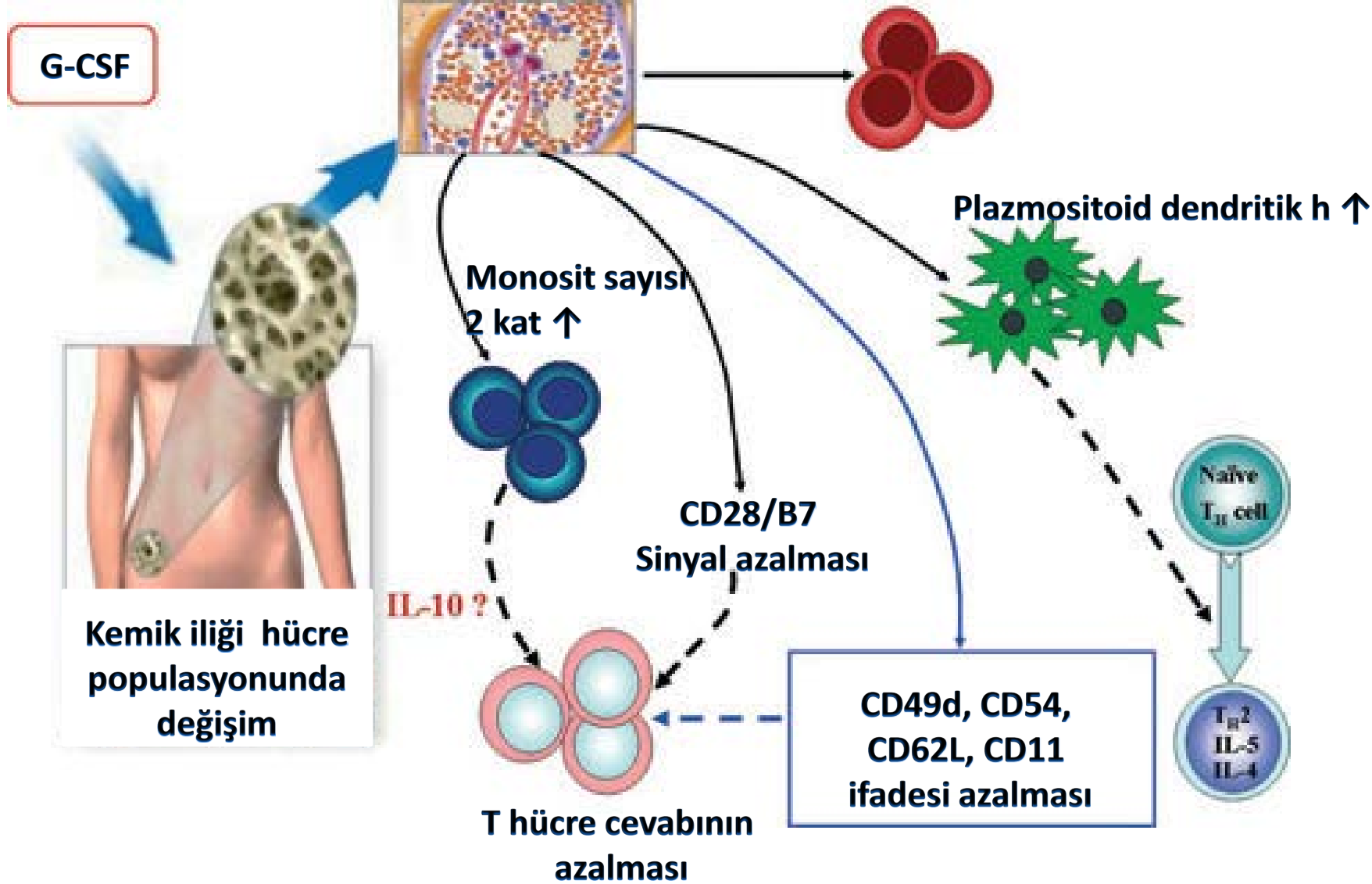
- Plerixafor

G-CSF ile vericiden KH mobilizasyonu

- Alıcı/verici kilo farkı çok olunca uygulanabilir
- Periferik KH → 4-5 gün 5-10 mcg/kg G-CSF
- Kemik iliğı → 2-3 gün 5-10 mcg/kg G-CSF
-



- CD34+ h sayısı 1.5-1.7 kat ↑
- LTC-IC 90 kat ↑
- Kısa süreli repop. akt 50 kat ↑



A prospective study of G-CSF–primed bone marrow as a stem-cell source for allogeneic bone marrow transplantation in children: a Pediatric Blood and Marrow Transplant Consortium (PBMTTC) study

Haydar Frangoul,¹ Eneida R. Nemecek,² Dean Billheimer,³ Michael A. Pulsipher,⁴ Shakila Khan,⁵ Ann Woolfrey,⁶ Becky Manes,¹ Catherine Cole,⁷ Mark C. Walters,⁸ Mouhab Ayas,⁹ Yaddanapudi Ravindranath,¹⁰ John E. Levine,¹¹ and Stephan A. Grupp¹²

BLOOD, 15 DECEMBER 2007 • VOLUME 110, NUMBER 13

A prospective multicenter trial was conducted to evaluate the safety and feasibility of granulocyte colony-stimulating factor (G-CSF)–primed bone marrow (G-BM) in children receiving allogeneic bone marrow transplantation (BMT). A total of 42 children with a median age of 9.8 years (range, 0.8-17 years) were enrolled. Donors with median age of 9.2 years (range, 1.1-22 years) received 5 μ g/kg per day of subcutaneous G-CSF for 5 consecutive days. BM was harvested on the fifth day. No donor

experienced complications related to G-CSF administration or marrow harvest. Median nucleated (NC) and CD34 cells infused was 6.7×10^8 /kg (range, 2.4 – 18.5×10^8 /kg) and 7.4×10^6 /kg (range, 2 – 27.6×10^6 /kg), respectively. Neutrophil and platelet engraftment was at a median of 19 days (range, 13-28 days) and 20 days (range, 9-44 days), respectively. A total of 13 (32%) patients developed grade 2 graft-versus-host disease (GVHD), and 5 (13%) of 40 evaluable patients developed chronic GVHD (3 limited and 2 extensive).

Higher cell dose was not associated with increased risk of acute or chronic GVHD. Overall survival and event-free survival at 2 years were 81% and 69%, respectively. Collection of G-BM from pediatric donors is safe, and can result in high NC and CD34 cell doses that facilitate engraftment after myeloablative BMT without a discernable increase in the risk of GVHD. (Blood. 2007;110:4584-4587)

© 2007 by The American Society of Hematology

Clinical outcomes and graft characteristics in pediatric matched sibling donor transplants using granulocyte colony-stimulating factor-primed bone marrow and steady-state bone marrow

Kuang-Yueh Chiang¹, Ann Haight², John Horan², Ellen Olson¹, Amy Gartner¹, Deborah Hartman¹, Susanne Youssef¹ and Diana Worthington-White¹

¹Aflac Cancer Center and Blood Disorders Service, Children's Healthcare of Atlanta, ²Emory University, Atlanta, GA, USA

Table 1. Patients' and donors' demographic data

G-BM					S-BM				
UPN	Disease	Gender (R/D)	Age (yr, R/D)	CMV (R/D)	UPN	Disease	Gender (R/D)	Age (yr, R/D)	CMV (R/D)
349	ALL, CR2	M/F	17.6/19.3	Pos/pos	306	ALL, CR1	M/M	16/13.6	Neg/pos
363	AML, CR1	M/F	14/12.8	Neg/neg	312	ALL, CR2	F/F	7/2.1	Neg/neg
366	ALL, CR2	M/F	11.6/14	Pos/pos	332	ALL, CR2	M/M	9/9	Pos/neg
375	SAA	M/M	10.9/16.3	Pos/pos	340	MDS	M/M	15.4/29.6	Pos/neg
389	BL, CR1	M/M	3/5.8	Pos/pos	343	CML, CP1	F/M	12.4/12.4	Pos/pos
417	LbL, CR3	M/M	4.6/10.4	Neg/neg	373	AML, CR1	F/F	15.2/17.6	Pos/pos
419	GS, PR2	M/F	12.7/16.5	Pos/pos	376	ALL, CR2	M/M	9.2/4.9	Pos/pos
420	AML, CR1	M/M	13.2/20.3	Neg/pos	404	AML, CR1	M/F	17.5/30.3	Neg/pos
442	ALL, CR2	M/M	9.7/5.6	Neg/neg	411	ALL, CR3	F/M	13.8/13.8	Pos/neg
444	ALL, CR2	M/F	17.4/20.4	Neg/neg	413	AML, CR1	M/F	17.9/22.7	Pos/pos
					426	AML, CR1	F/F	16.7/13.1	Pos/neg
					433	AML, CR1	F/M	8.2/8.2	Neg/neg

	BM volume (mL)	Weight (R, kg)	Weight (D, kg)	TNC/kg*	CD34 ⁺ /kg	CD3 ⁺ /kg	CFU-GM/kg**
G-BM	714 (312–833)	40.9 (13.8–68.9)	53.1 (20.9–81.1)	7.01×10^8 (4–11.1)	4.44×10^6 (2.3–15.2)	3.86×10^7 (0.7–6.7)	7.19×10^5 (2.6–10.3)
S-BM	618 (270–2056)	41.6 (6–96.9)	54.4 (13.8–101.8)	3.76×10^8 (1.21–6.48)	5.17×10^6 (3.5–14)	2.96×10^7 (2.1–4.5)	3.53×10^5 (0.9–11.4)

	WBC engraftment (days)	Platelet engraftment (days)	Length of stay (days)*
G-BM	+15.5 (13–23)	+21 (14–141)	28 (27–105)
S-BM	+16.5 (13–24)	+25 (14–75)	40 (25–65)

G-BM grubu -3→-1 de 5 mcg/kg G-CSF

15 mL/kg ürün toplanmış

Do two different stem cell grafts: G-CSF stimulated and unstimulated bone marrow differ according to hematopoietic colony forming capacity?



Meltem Özgüner^{a,b,*}, Mehmet Fatih Azık^b, Betül Tavit^{b,c}, İkbâl Bozkaya^b, Yasin Köksal^a, Elif Canal^a, Duygu Uçkan^{b,c}, Bahattin Tunç^b

The demographic features of donors.

Donors	Unstimulated BM	Stimulated BM	P value
Age [year, Median (Min–Max)]	14 (7–26)	12 (4–51)	0.42*
Gender (Male/Female)	7/6	7/6	
Weight (kg, Mean ± SD)	48.19 ± 22	41.10 ± 17.7	0.39*

Statistical test: Mann–Whitney–U test.

* $p \geq 0.05$ (NS).

CFU Assay Results.

	Stimulated BM	Unstimulated BM	P
BFU-E ($\times 10^4$ /kg)	15.20	8.38	0.01*
CFU-GM ($\times 10^4$ /kg)	10.35	5.67	0.01*
CFU-E ($\times 10^4$ /kg)	0.59	0.33	0.57
GEMM ($\times 10^4$ /kg)	0.52	0.53	0.97

Statistical test: Mann–Whitney–U test.

* $p < 0.05$: the difference is statistically significant.

Stimüle-BM grubu ürün toplama öncesi

3 gün 10 mcg/kg G-CSF aldı



Clinical outcomes and graft characteristics in pediatric hematopoietic stem cell transplantation: Effect of granulocyte-colony stimulating factor priming

Ali Fettah ^{a,*}, Namık Özbek ^a, Fatih Azık ^a, Betül Tavil ^a, Meltem Özgüner ^{a,b}, Zekai Avcı ^a, Pamir Işık ^a, Neşe Yaralı ^a, Duygu Uçkan ^a, Bahattin Tunç ^a

Graft characteristics.^a

	S-BM group	G-BM group	P value
BM volume (mL)	729 (202–1370)	480 (144–1419)	0.2
CD 34 ⁺ cells/μL	125 (27–240)	180 (55–676)	0.05
CD34 ⁺ cells (×10 ⁶ /recipient weight)	3.4 (1.1–10.2)	2.6 (1.3–16.3)	0.1
TNC×10 ⁸ /kg)	4.1 (2.1–6.9)	7.1 (3.2–16.3)	0.0001
Neutrophil count (×10 ⁹ /L)	8.2 (3.6–15.2)	26.3 (15.3–50.6)	0.0001
Lymphocyte count (×10 ⁹ /L)	3.1 (1.7–7.8)	3.8 (2.1–17.8)	0.07
Monocyte count (×10 ⁹ /L)	0.9 (0.47–1.73)	1.4 (0.53–4.1)	0.0001
CFU-GM (×10 ⁴ /recipient weight)	7.95 (2.36–21.37)	13.82 (4.7–34.6)	0.01



- ✓ **Nötrofil ve Platelet engrafman süreleri benzer Hastanede kalış süreleri benzer**
- ✓ **FN epizodları S-BM grubunda daha az (23/32)**
- ✓ **Stimüle-BM grubu ürün toplama öncesi 3 gün 10 mcg/kg G-CSF aldı**

Factors associated with bone marrow stem cell yield for pediatric allogeneic stem cell transplantation: The impact of donor characteristics

Ali Fettah¹ | Namık Özbek¹ | Meltem Özgüner² | Fatih Azık¹ | Pamir Işık¹ |
Zekai Avcı¹ | Neşe Yaralı¹ | Duygu Uçkan^{1,2} | Bahattin Tunç¹

Pediatric Transplantation 2017; 21: e12841;

TABLE 4 Comparison of TNC count, CD34⁺ cell count, and CD34⁺ cell/TNC ratio between SS-BM donors whose height was <154 cm and >154 cm and whose platelet count was <254×10⁹/L and >254×10⁹/L

BM characteristics	SS-BM group					
	Donors' body height			Donors' platelet count		
	<154 cm	>154 cm	P	<249×10 ⁹ /L	>249×10 ⁹ /L	P
TNC count (×10 ⁸ /mL)	0.15 (0.1-0.21)	0.1 (0.06-0.14)	<.0001	0.1 (0.06-0.13)	0.14 (0.08-0.21)	<.0001
CD34 ⁺ cell count (×10 ⁶ /mL)	0.17 (0.07-0.24)	0.07 (0.02-0.24)	<.0001	0.06 (0.02-0.24)	0.17 (0.06-0.24)	.0001
CD34 ⁺ cell/TNC ratio (×100)	1.18 (0.62-2.43)	0.64 (0-26-1.09)	<.0001	0.61 (0.26-1)	1.05 (0.46-2.43)	.001

Two versus three day upfront use of granulocyte-colony stimulating factor in healthy bone marrow donors for pediatric bone marrow transplantation

Tekin Aksu^{a,*}, İkbāl Ok Bozkaya^a, Sibel Akpınar Tekgündüz^b, Mehtap Olcar Kanbur^a, Yasin Köksal^c, Meltem Özgüner^c, Namık Yaşar Özbek^a

<https://doi.org/10.1016/j.transci.2017.11.015>

Peripheral blood cell counts according to G-CSF priming day.

	+24 h ^a (n = 17)	+48 h ^a (n = 17)	+72 h ^b (n = 6)
WBC (x10 ⁹ /L)	27,9 (12,7–44)	32,5 (8,5–50,9)	38 (9,5–45,6)
MNC (x10 ⁹ /L)	3,9 (1,6–31,4)	4,2 (2,8–10,2)	7,6 (4,9–39,2)
Lymphocyte (x10 ⁹ /L)	2,9 (1,4–7,3)	3,1 (1,8–8,3)	3,95 (2,1–7,1)
Monocyte (x10 ⁹ /L)	0,85 (0,2–26)	1 (0,1–5,6)	2,15 (1,1–33,9)
CD34+ (/μL)	2 (0–6)	7 (1–18)	45,5 (13–56)

^a All patients.

^b G-CSF3 group; All data represented as median (min-max); WBC: White blood cell; MNC: Mononuclear cell.

Table 2

Bone marrow cell counts according to G-CSF priming day.

	G-CSF2 n = 11	G-CSF3 n = 6	P value
WBC (x10 ⁹ /L)	29.8 (25.1–58.8)	42.55 (16.3–201.8)	0.42
MNC (x10 ⁹ /L)	6.9 (4.2–25.8)	23.4 (17–43)	0.03
CD34 (/μL)	164 (66–962)	227 (112–770)	0.26
TNC (x10 ⁸ /kg recipient BW)	6.73 (2.1–12.5)	5.76 (1.2–10.9)	0.54
MNC (x10 ⁸ /kg recipient BW)	1.2 (0.9–1.8)	1.2 (0.5–1.9)	0.88
CD34+ (x10 ⁶ /kg recipient BW)	3.4 (1.8–5.4)	3.13 (1.07–4.17)	0.31

Plerixafor on demand in ten healthy family donors as a rescue strategy to achieve an adequate graft for stem cell transplantation

Salvatore Gattillo,¹ Sarah Marktel,² Lorenzo Rizzo,² Simona Malato,¹ Lucia Malabarba,¹
Milena Coppola,¹ Andrea Assanelli,² Raffaella Milani,¹ Tiago De Freitas,² Consuelo Corti,²
Laura Bellio,¹ and Fabio Ciceri^{1,2}

TRANSFUSION 2015;55:1993–2000

TABLE 1. Characteristics of donors, mobilization, and stem cell harvest*

Donor number	Sex/age (years)	Donor/ patient weight (kg) = ratio	WBCs ($\times 10^9/L$)	Day of expected harvest after G-CSF mobilization							PL (mg/kg)	Day after PL administration										AEs (grade)	Fold increase	
				CD34%	CD34/ μL	CD3+	CD8+	CD4+	CD19+	CD34+/kg		WBC	CD34%	μL	CD3+	CD8+	CD4+	CD19+	CD34+/kg	μL	Fold increase CD34+/kg			
1	M/68	95/60 = 1.6	22	0.05	11	25	13	11	3	1.1	0.25	39	0.09	38	20	10	9.6	4	4.3	Bone pain (I)	3.4	3.9		
2	F/37	51/86 = 0.6	42	0.08	34	51	18	28	6	1.3	0.47	70	0.21	147	28	NA	NA	NA	7.0	Bone pain (I) + dyspnea (II)	4.3	5.3		
3	F/52	65/62 = 1.0	43	0.05	22	27	8	18	5	1.1	0.37	74	0.04	29	30	9	18.8	8	1.3		1.1	1.2		
4	M/58	70/55 = 1.2	37	0.08	30	31	7	21	7.0	3.9	0.34	68	0.11	75	24	4	12.5	7	8.3		2.5	2.1		
5	M/65	75/53 = 1.4	29	0.09	26	24	9	16	3	3.2	0.32	39	0.08	32	18	7	12.2	3	3.6		1.2	1.1		
6	F/73	74/115 = 0.6	42	0.05	21	18	6	13	4	1.1	0.32	68	0.10	67	19	8	12.6	6	4.3		3.2	3.9		
7	M/63	66/61 = 1.0	34	0.09	30	14	5	7	6	2.9	0.36	60	0.07	42	15	5	9.6	9	4.2		1.4	1.4		
8	F/39	56/46 = 1.2	NA	NA	NA	NA	NA	NA	NA	NA	0.42	21	0.08	17	51	16	36.0	13	1.8		NA	NA		
9	M/57	68/90 = 0.7	NA	NA	NA	NA	NA	NA	NA	NA	0.35	29	0.14	41	33	6	25.9	11	4.1		NA	NA		
10	F/38	57/87 = 0.6	35	0.08	28	15	5	9	2	1.2	0.24	47	0.17	87	22	9	12.0	4	5.6	Vomiting (I)	3.1	4.6		
Mean	55		35	0.07	25	25.6	8.8	15.3	4.5	2.00		51	0.10	57	26.0	8.2	16.5	7.2	4.4		2.5	2.9		
Median	57		36	0.08	27	24.5	7.5	14.5	4.5	1.2	0.35	53	0.10	41	23.0	8.0	12.5	7.0	4.2		2.8	3.0		
(range)	(37-73)		(22-42)	(0.05-0.09)	(11-34)					(1.1-3.9)	(0.24-0.47)	(21-74)	(0.04-0.21)	(17-147)					(1.3-8.3)		(1.1-4.3)	(1.1-5.3)		

* CD3+, CD8+, CD4+, and CD19+ data are expressed as % of CD45+ cells.

F = female; M = male; NA = not available.

Poor responder

Megadoz CD34

Çoğu haplo nakil /Tek doz plerixafor verilmiş
10-11 saat sonra ürün toplanmış

