Transfüzyon Hangi Hastaya Ne Zaman?

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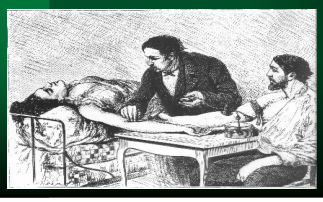
Tarihçe

- 1492 ilk girişim
- 1667 Dr.Jean-Baptiste Denis
- 1818 Dr.James Blundell

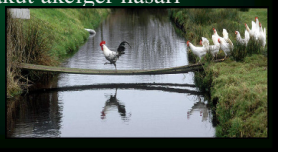


Tarihçe

- 1914 Dr.Albert Hustin
- 1916 Oswald Hope Robertson

Transfüzyon Komplikasyonları

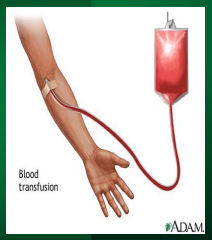
- Enfeksiyonlar
- Hemolitik reaksiyonlar
- Febril reaksiyonlar
- Allerjik reaksiyonlar
- Transfüzyon sonucu akut akciğer hasarı
- Hipervolemi
- Elektrolit imbalansı
- Geç komplikasyonlar



Risk Yönetimi

- Kontrol mekanizmalar
- Kontrol listeler
- Barkot uygulamaları
- Hastanın özellikleri

Ana Prensip



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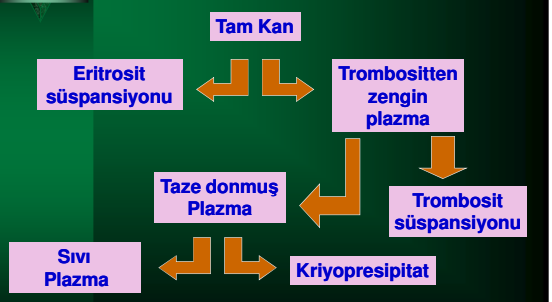
KAN KOMPONENTLERİ



Taze Tam Kan

- 24 saat içinde alınmış
- Kompanentleri ayrılmamış
- Kırmızı kan hc.+ Platelet + Plazma + Pıhtılaşma faktörlerini içeren

Taze Tam Kan

- Kompanent (-)
- Masif transfüzyon ihtiyacı

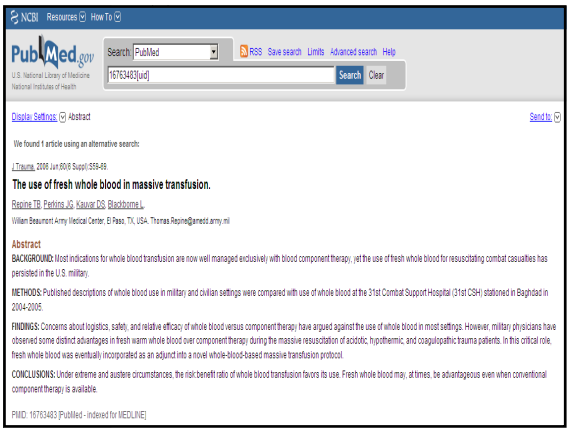
(GİS kanama, AAR, Major travma)

Masif Transfüzyon

- Tüm kan değişimi / 24 h
- Tüm kanın % 50'sinin / 3 h
- 10 veya ↑ ES / 24 h
- 4 veya ↑ ES / 4 h

Taze Tam Kan

- Askeri durumlar
- Kitlesel kaza-felaket
- Exchange transfüzyonlar
- Pediatrik açık kalp ameliyatları



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J Trauma. 2006 Jun 60(6 Suppl):S89-99.

The use of fresh whole blood in massive transfusion.

Repine TB, Perkins JG, Kauvar DS, Blackborne L.

William Beaumont Army Medical Center, El Paso, TX, USA. Thomas.Repine@amedd.army.mil

Abstract

BACKGROUND: Most indications for whole blood transfusion are now well managed exclusively with blood component therapy, yet the use of fresh whole blood for resuscitating combat casualties has persisted in the U.S. military.

METHODS: Published descriptions of whole blood use in military and civilian settings were compared with use of whole blood at the 31st Combat Support Hospital (31st CSH) stationed in Baghdad in 2004-2005.

FINDINGS: Concerns about logistics, safety, and relative efficacy of whole blood versus component therapy have argued against the use of whole blood in most settings. However, military physicians have observed some distinct advantages in fresh warm whole blood over component therapy during the massive resuscitation of acidotic, hypothermic, and coagulopathic trauma patients. In this critical role, fresh whole blood was eventually incorporated as an adjunct into a novel whole-blood-based massive transfusion protocol.

CONCLUSIONS: Under extreme and austere circumstances, the risk:benefit ratio of whole blood transfusion favors its use. Fresh whole blood may, at times, be advantageous even when conventional component therapy is available.

PMID: 16763483 [PubMed - indexed for MEDLINE]

Kan Kompanentleri

Kompanent	Ömür	Volüm/ünite (ml)	Doz	Doz etkisi
Eritrosit Süspansiyonu	21-42 gün	250-300	2 Ünite ya da 15 ml/kg	Hb 2 ünite ↑
Platelet(aferez)	5 gün	250-300	1 Ünite ya da 5 ml/kg	Plt 50.000/mm3 ↑
Platelet	5 gün	50-60	6 ünite ya da 5 ml/kg	Plt 50.000/mm3 ↑
TDP	1 yıl donmuş 24 saat erimiş	200-250	4 Ünite ya da 15 ml/kg	Koag.Fakt.%20 ↑
Kriyopresipitat	1 yıl 4 saat erimiş	20-50	10 ünite ya da 1 ünite / 5 kg	Fibrinojen 75 mg/dl ↑

ANEMİ SEMPTOM-BULGULARI

Semptomlar	Bulgular
Azalmış efor kapasitesi	**Solukluk**
Halsizlik	**Taşikardi**
Yorgunluk	**Belirgin kalp tepe atımı**
Çarpıntı	**Kalpte sistolik üfürüm**
Baş dönmesi	

ANEMİ SEMPTOM-BULGULARI

1.Aneminin derecesine
2.Aneminin gelişme hızı
3.Hastanın kalp-Akc işlevine
4.Hastanın yaşına
5.Anemiye neden olan altta yatan hastalığa

Akut gelişen anemilerde Hgb<10 olduğunda semptomatik iken Kronik anemilerde kompansasyon mekanizmalarından dolayı ancak hgb<7-8 g/dl olduğunda semptonlar ortaya çıkar

Kompansayon mekanizmaları
1.Kalp debisi artışı
2.Plazma volüm artışı
3.Solunum sayısında artma
4.Eritrosit 2-3 DPG düzeyinde artış
5.EPO düzeyinde artış

Eritrosit Süspansiyonu

- 250 ml
- % 55-80 Hct içerir → Hct % 3 ↑
  Hg 1 gr/dl ↑

Eritrosit Süspansiyonu

- O2 taşıma kapasitesi ↓
  - Akut kan kayıpları
  - Kronik derin anemiler

AKUT KAN KAYBI

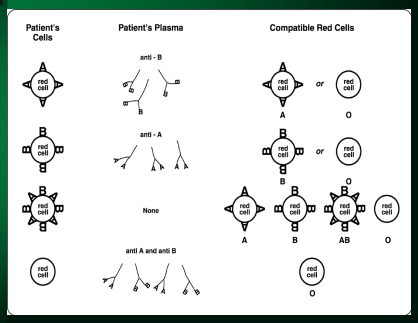
Class	1	2	3	4
Kan volüm	<%15	%15-30	%30-40	>%40
Kan kaybı	<750 ml	750-1500 ml	1500-2000 ml	>2000 ml
KN	<100	100 -120	120 - 140	>140
KB	Normal	Normal	Azalmış	Azalmış
Nb B	Normal	Azalmış	Azalmış	Azalmış
SS	14 - 20	20 - 30	30 - 40	>40
SSS	Normal	Anksiyete	Konfüzyon	Letarjik

TKV = 2,5 L/mm3 = 70 – 85 ml/kg (x70 = 5000 ml)

Akut Kan Kaybı

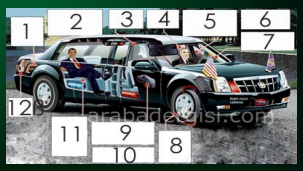
- Evre 3-4 hasta
  - 2 L kristaloid / 20 dk
    (40ml / kg çocuk için)
    - Eritrosit süspansiyonu
      (1Ü → 1Ü)

ABO & Rh Kan Grupları



Akut Kan Kayıpları

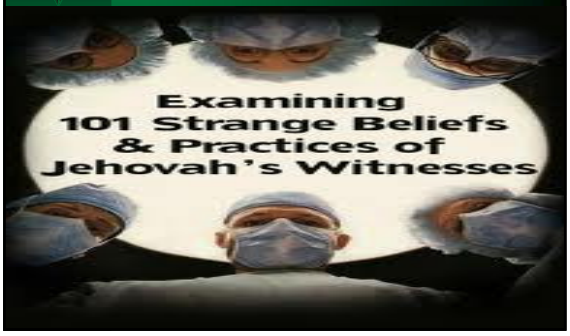
- Kan grubu tayini 15 dk
- Tarama testleri 60 dk
- Cross 60 dk

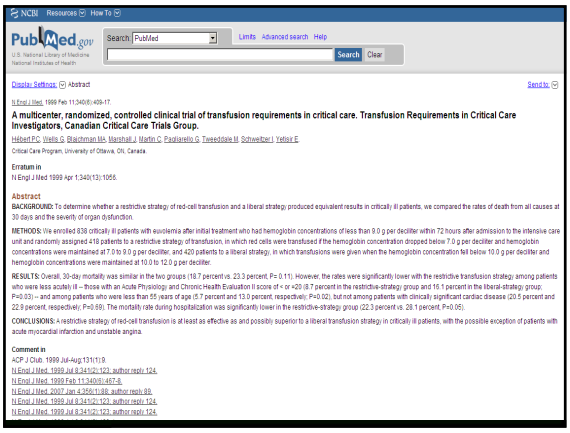


Kronik Anemi

- Hafif semptomlar
  (yorgunluk, güçsüzlük, başdönmesi, ↓egzersiz toleransı)
- Şiddetli semptomlar
  (↑solunum sayısı, solunumun yüzeyelleşmesi, bilinç değişikliği)

Kronik Anemi





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N Engl J Med. 1999 Feb 11;340(6):409-17.

A multicenter, randomized, controlled clinical trial of transfusion requirements in critical care. Transfusion Requirements in Critical Care Investigators, Canadian Critical Care Trials Group.

Hébert PC, Wells G, Blajchman MA, Marshall J, Martin C, Pagliarello G, Tweeddale M, Schweitzer I, Yetisir E.

Critical Care Program, University of Ottawa, ON, Canada.

Erratum in
N Engl J Med 1999 Apr 1;340(13):1056.

Abstract

BACKGROUND: To determine whether a restrictive strategy of red-cell transfusion and a liberal strategy produced equivalent results in critically ill patients, we compared the rates of death from all causes at 30 days and the severity of organ dysfunction.

METHODS: We enrolled 838 critically ill patients with euvolemia after initial treatment who had hemoglobin concentrations of less than 9.0 g per deciliter within 72 hours after admission to the intensive care unit and randomly assigned 418 patients to a restrictive strategy of transfusion, in which red cells were transfused if the hemoglobin concentration dropped below 7.0 g per deciliter and hemoglobin concentrations were maintained at 7.0 to 9.0 g per deciliter, and 420 patients to a liberal strategy, in which transfusions were given when the hemoglobin concentration fell below 10.0 g per deciliter and hemoglobin concentrations were maintained at 10.0 to 12.0 g per deciliter.

RESULTS: Overall, 30-day mortality was similar in the two groups (18.7 percent vs. 23.3 percent; P= 0.11). However, the rates were significantly lower with the restrictive transfusion strategy among patients who were less acutely ill – those with an Acute Physiology and Chronic Health Evaluation II score of < or =20 (8.7 percent in the restrictive-strategy group and 16.1 percent in the liberal-strategy group; P=0.03) – and among patients who were less than 55 years of age (5.7 percent and 13.0 percent, respectively; P=0.02), but not among patients with clinically significant cardiac disease (20.5 percent and 22.9 percent, respectively; P=0.59). The mortality rate during hospitalization was significantly lower in the restrictive-strategy group (22.3 percent vs. 28.1 percent; P=0.05).

CONCLUSIONS: A restrictive strategy of red-cell transfusion is at least as effective as and possibly superior to a liberal transfusion strategy in critically ill patients, with the possible exception of patients with acute myocardial infarction and unstable angina.

Comment in
ACP J Club. 1999 Jul-Aug;131(1):9.
N Engl J Med. 1999 Jul 8;341(2):123; author reply 124.
N Engl J Med. 1999 Feb 11;340(6):467-8.
N Engl J Med. 2007 Jan 4;356(1):88; author reply 89.
N Engl J Med. 1999 Jul 8;341(2):123; author reply 124.
N Engl J Med. 1999 Jul 8;341(2):123; author reply 124.

Eritrosit Süspansiyonu

- Uygulama hızı 1-4 sa
- Yüklenme riski varsa 1 ml/kg/sa
- Eş zamanlı sıvı (=SF)

Modifiye Eritrosit Süspansiyonu

- Lökosit azaltma
  (HLA alloimmünizasyon,CMV enf., Febril hemolitik reaksiyon)
- Yıkama
  (Ciddi allerji riski, IgA eks.olanlarda)
- Volüm azaltma
  (Yüklenme riski olanlarda)
- İrridasyon
  (İmmünitesi bozuk, Malignensi hastaları, İU transfüzyon, Neonatal Transfüzyon, Allogenik Kİ transfüzyonu olanlarda)
- Dondurulmuş ES
  (Otolog transfüzyon)

Platelet Transfüzyonu

- Profilaktik ya da Terapötik amaçla
- Aferez / Tam kan
- 1 ünite ➡ 50.000/mm^3 ↑
- Grup spesifik olmalı
- Etyoloji?
- Spontan kanama riski?

Platelet Transfüzyonu

- Asemptomatik < 10.000/mm3
- Koagülasyon bzk-minor kanama < 15.000mm3
- Major kanama, sepsis, ateş < 20.000 mm3
- Minor invaziv girişim < 50.000 mm3
  (Torasentez, parasentez, genel cerrahi girişim, masif transfüzyon)
- Major invaziv girişim < 100.000mm3
  (Nörolojik ya da kardiyak cerrahi)

Platelet Transfüzyonu

- Relatif Kontrendike
  - -TTP
  - -ITP
  - -Heparin nedenli trombositopeni

Platelet Transfüzyonu

- Nonfonksiyone trombosit
  - -vWH
  - -Üremi
  - -Antiplatelet ilaçlar
  - -Hiperglobülinemi

Taze Donmuş Plazma

- Warfarinin antikoagülan etkisi
- Multi koagülasyon bozukluk ve kanama
- Spesifik faktöre ulaşamıyorsak
- Masif transfüzyon
- Angio ödem
- Antitrombin eksikliği

Taze Donmuş Plazma

- Doz = 15ml/kg (4 ünite)
- PT-PTT-INR ölçümü
- Transfüzyon kararı INR ilişkisi

Kriyopresipitat

- Tarihi önemi var

  (Hemofili A-vWH)
- Faktör 8,13, vWF, IgM, IgG, albümin, fibronektin ve fibrinojen

Kriyopresipitat

- Hipofibrinojenemi-Disfibrinojenemi
- Spesifik faktör yoksa
- Fibrinojen < 80-100

  (karaciğer yetmezliği, DIC, dilüsyonel koagülopati) →

  kanama riski var
- 1 ünite 20-50 ml
- Dozu 1 ünite / 5kg (Genellikle 10 ünite)

Faktör 7

- Faktör 7-8-9 eks.
- Kanamalı infantlarda
- Masif transfüzyonda

Faktör 8-9

- Hemofili-A
- Hemofili-B

Albümin

- Onkotik basıncı sağlar
- %5 ve %25'lik çözeltiler

Albümin

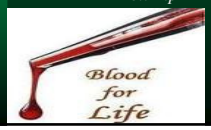
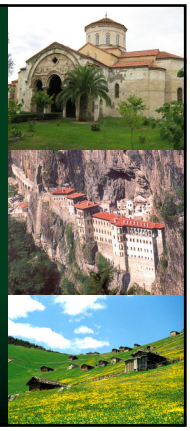
- Kapiller kaçak sendromu
- Hemorajik olmayan şok
- Geniş yanık
- Fazla asid boşaltılması

IVIG

- ITP
- Gullian-Barre send.
- Pediyatrik HIV
- Allogenik kök hc. transplantasyonu
- Viral nörolojik hastalıklar
- Kr.inflamatuvar demiyelinizan polinöropatiler
- KLL
- Kawasaki send.
- Hipogamaglobülinemi

Antitrombin

- Koagülasyonu inhibe eder
- Eksikliği → tromboz
- Doz = 50 ünite/kg infüzyon
  (normal değerin %80'i hedef)

Dinleyen ve kan veren herkese
Teşekkürler

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