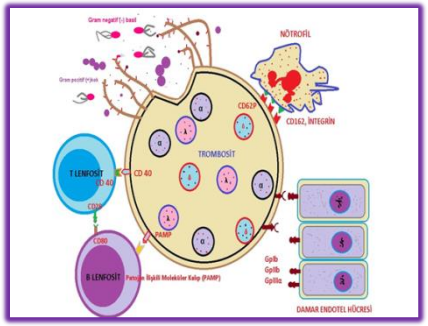
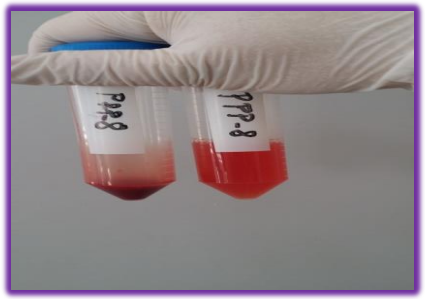
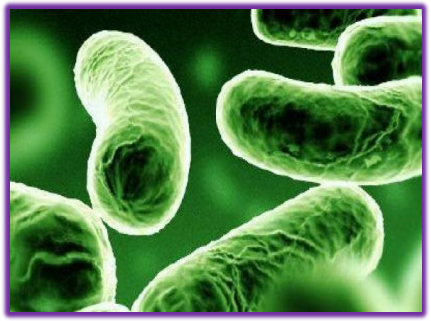
Trombositten Zengin Plazmanın (PRP) Çoklu İlaç Direncine Sahip Çeşitli Bakteriler Üzerine Antibakteriyel Etkinliğinin İn-vitro Araştırılması







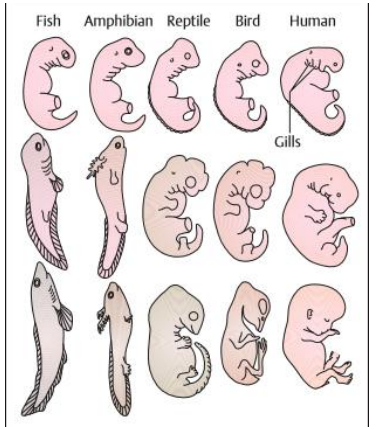
Dr. R. Aytaç ÇETİNKAYA

Trombosit

- ✓ Çoğu omurgasız ve erken omurgalı canlı

- ✓ Hemosit
- ✓ Memeli canlı geçirdikleri evrim

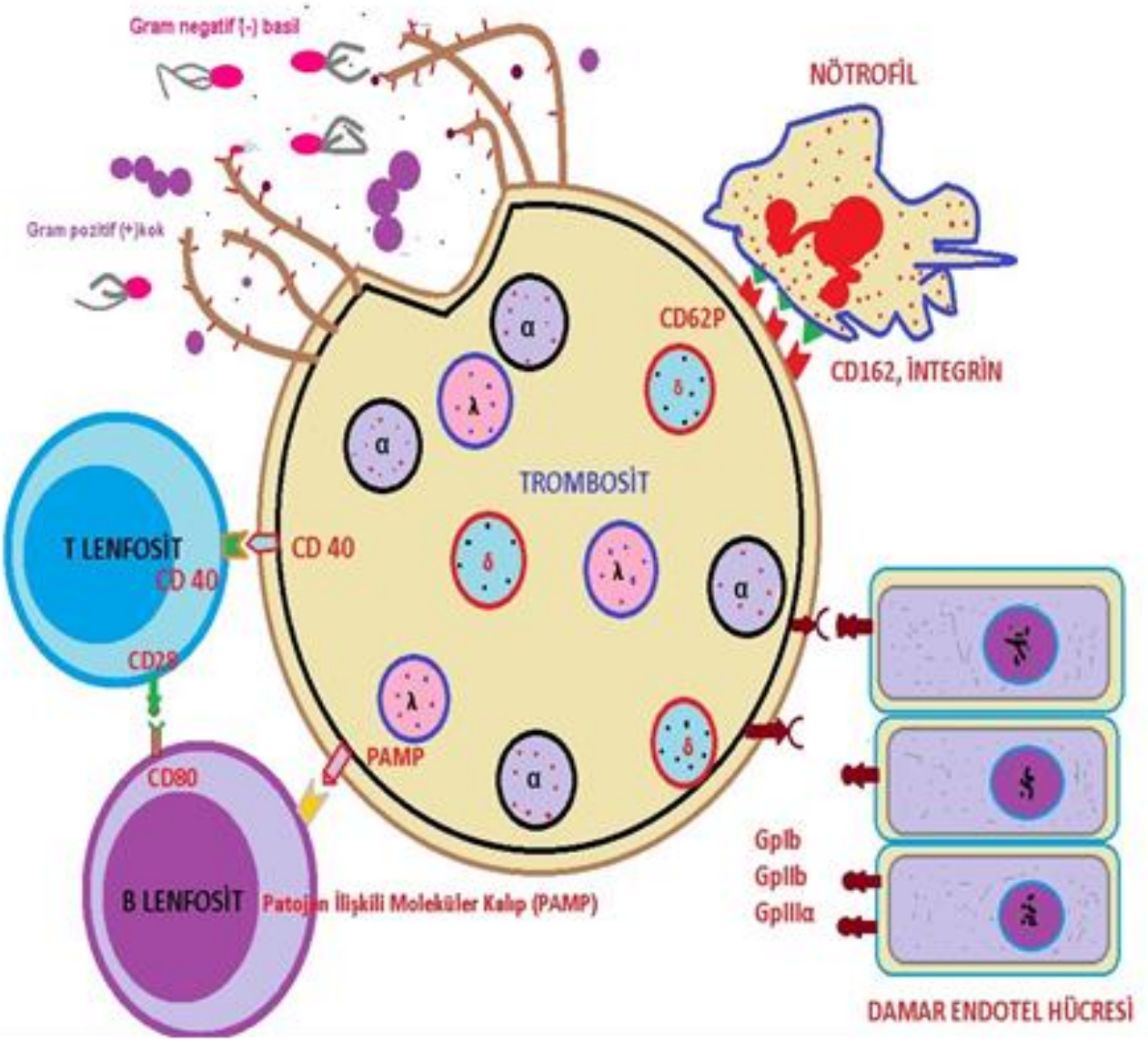
Trombositler:	hemostaz
Lökositler:	enfeksiyon
Lenfositler:	immunregülasyondan
Eritrosit:	oksijen taşıma



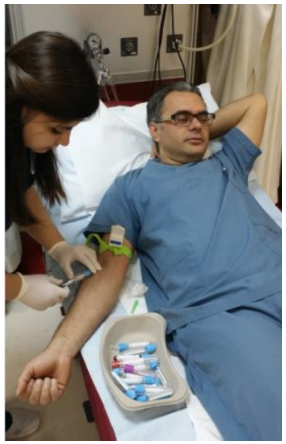
- ✓ Trombositler ilkel hemosit (konak savunma)

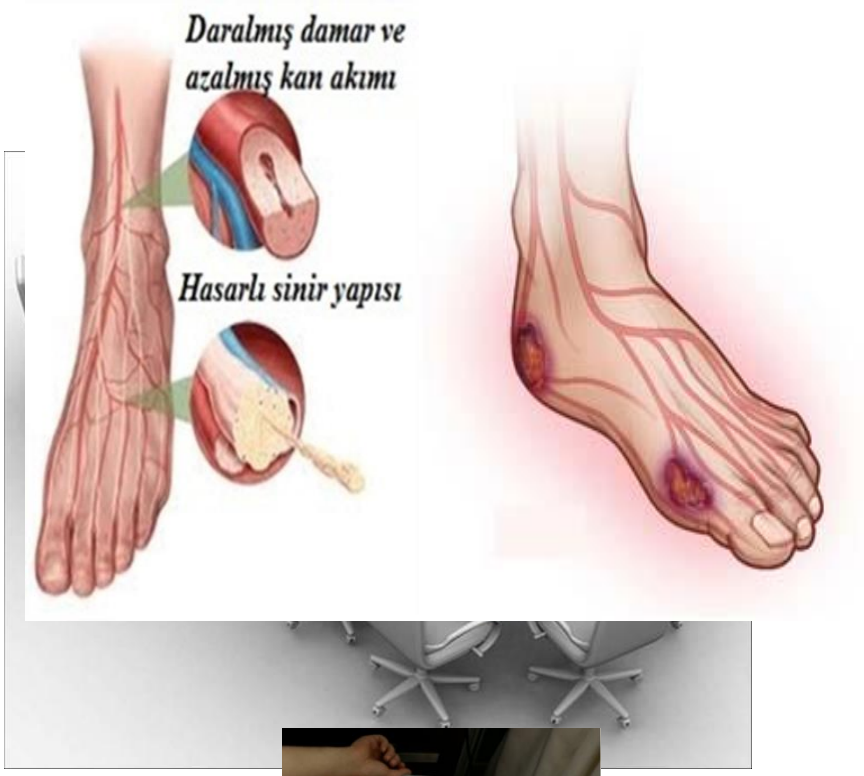
Yeaman MR. Platelets in defense against bacterial pathogens. Cell Mol Life Sci. 2010

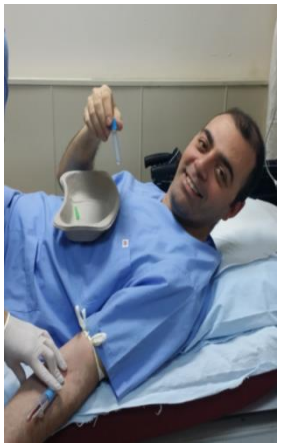
Konak Savunma



- ✓ Hasar / enfeksiyon hareket
- ✓ Diskoid şekil Ameboid
- ✓ Hasarlı doku adezyon reseptör artışı
- ✓ Reaktif oksijen
- ✓ Psödopod uzaması
- ✓ Granüllerin salınımı




Daralmış damar ve
azalmış kan akımı
Hasarlı sinir yapısı



Etik Kurul

- Sağlık Bilimleri Üniversitesi
- Haydarpaşa Numune Eğitim Araştırma Hastanesi Etik Kurulu
- 13 Mart 2017
- HNEAH-KAEK 2017/KK/25
- Çalışmamızda kurumumuzdan mali destek alınmadı.

Materyal Metod

	TZP Grubu	TFP Grubu	PBS (Kontol) Grubu
Buyyon	700 µl	700 µl	700 µl
Bakteri ($1x10^5$)	100 µl	100 µl	100 µl
Trombin	40 µl	40 µl	40 µl
TZP	160 µl	-	-
TFP	-	160 µl	-
PBS	-	-	160 µl

TZP: Trombositten zengin plazma, **TFP:** Trombositten fakir plazma, **PBS:** Phosphate buffered saline

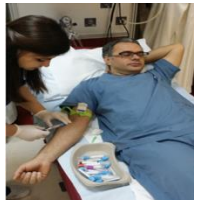
MRSA

VRE

GSBL *Klebsiella pneumoniae*

Karbapenem dirençli *P. aeruginosa*

10 sağlıklı kan bağışçısı


Trombositten Zengin Plazma (TZP)

Magellan PRP™ kiti 60 ml enjektör

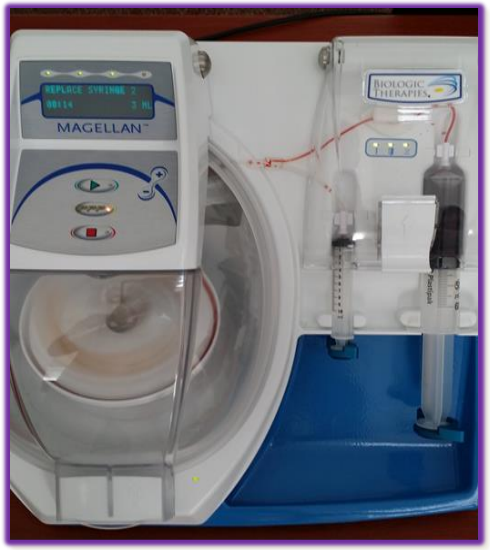
6 ml ACD-A

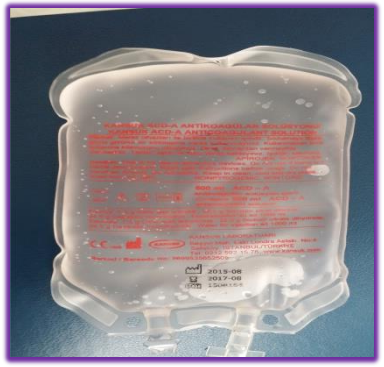
54 ml Tam Kan

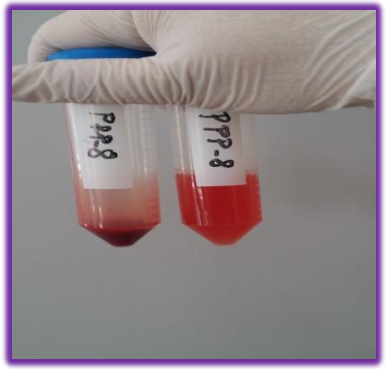
Magellan PRP™ cihazı

Düşük devir + Yüksek devir

3 ml TZP (PRP)







Trombositten Fakir Plazma (TFP)

Magellan PRP™ kiti 60 ml enjektör

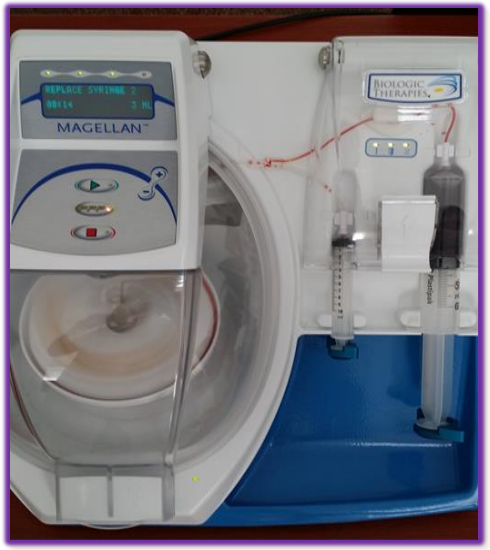
6 ml ACD-A

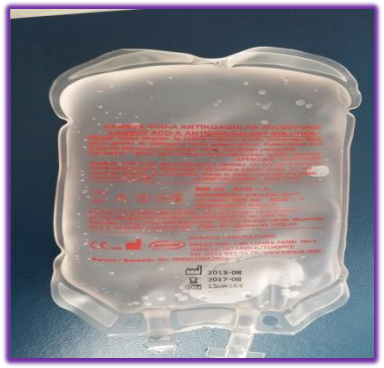
54 ml Tam Kan

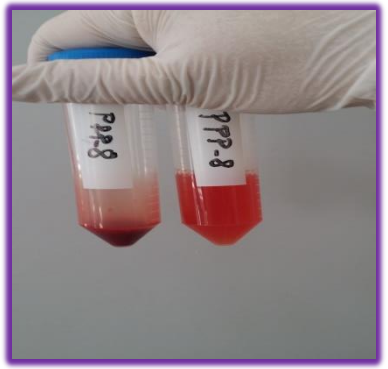
Magellan PRP™ cihazı

Düşük devir + Yüksek devir

20 ml TFP (Platelet Poor Plasma, PPP)







Otolog Trombin Elde Edilmesi

Vacuette®

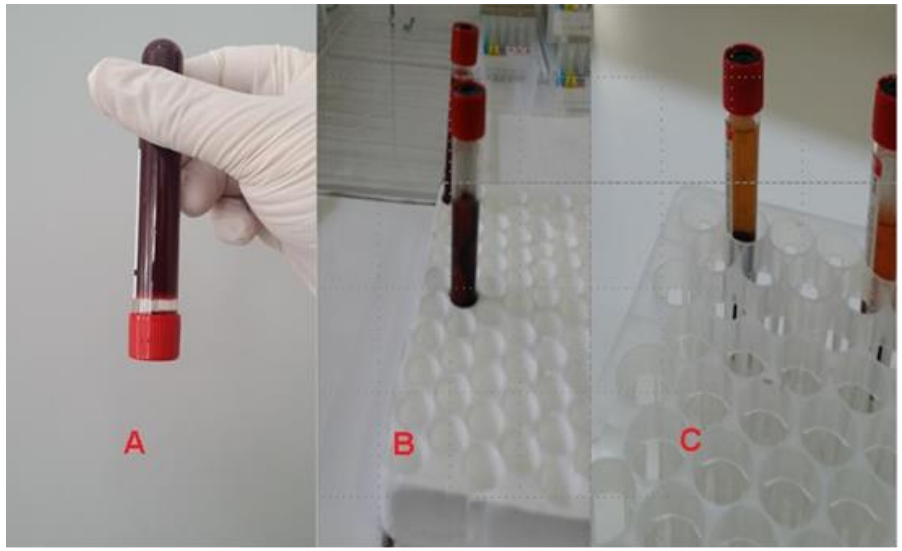
9 ml Tam Kan

1 ml %10 Kalsiyum Glukonat
(Calcium Picken Ampul ®)

10 dak.

Elle manuel 1-2 dk.

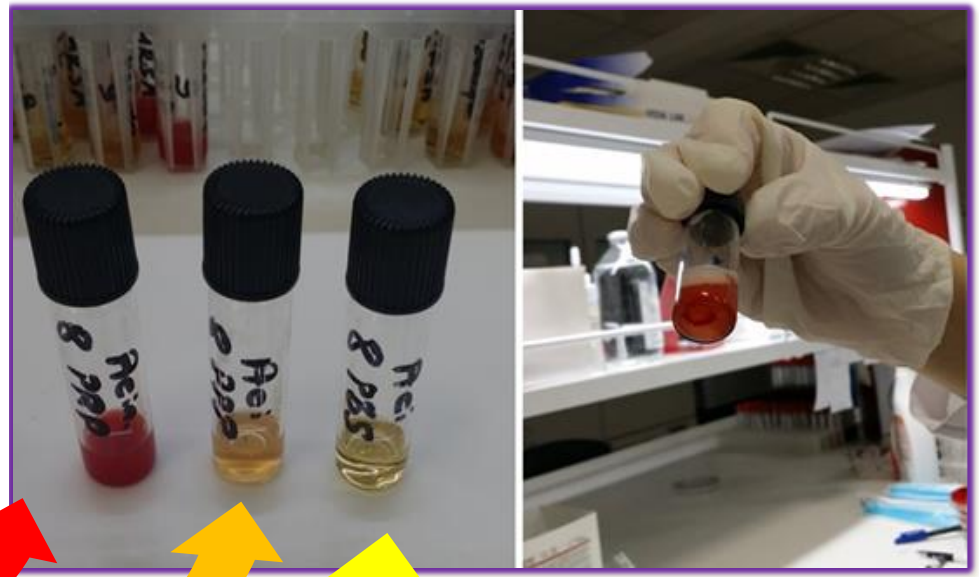
3 dak. 3000 rpm (Nüve NF 200)

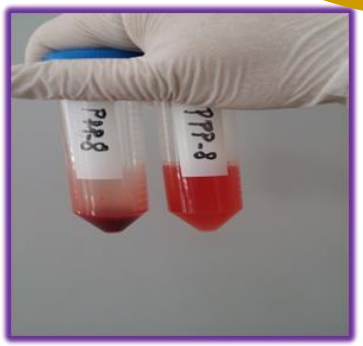


Çalışma Grupları

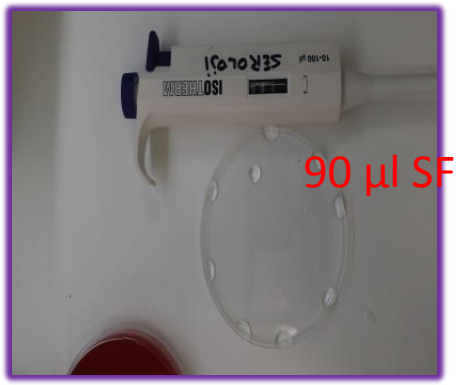
	TZP Grubu	TFP Grubu	PBS (Kontol) Grubu
Buyyon	700 µl	700 µl	700 µl
Bakteri ($1x10^5$)	100 µl	100 µl	100 µl
Trombin	40 µl	40 µl	40 µl
TZP	160 µl	-	-
TFP		160 µl	-
PBS		-	160 µl

TZP: Trombositten zengin p[illegible]na, **TFP:** Tron[illegible]tten fakir plazma [illegible]: Phosphate buffered saline



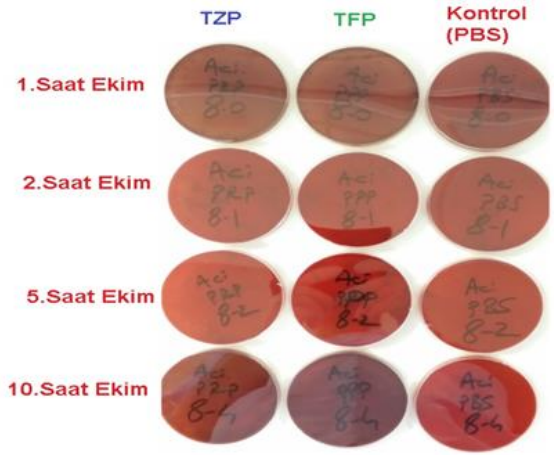


10 µl

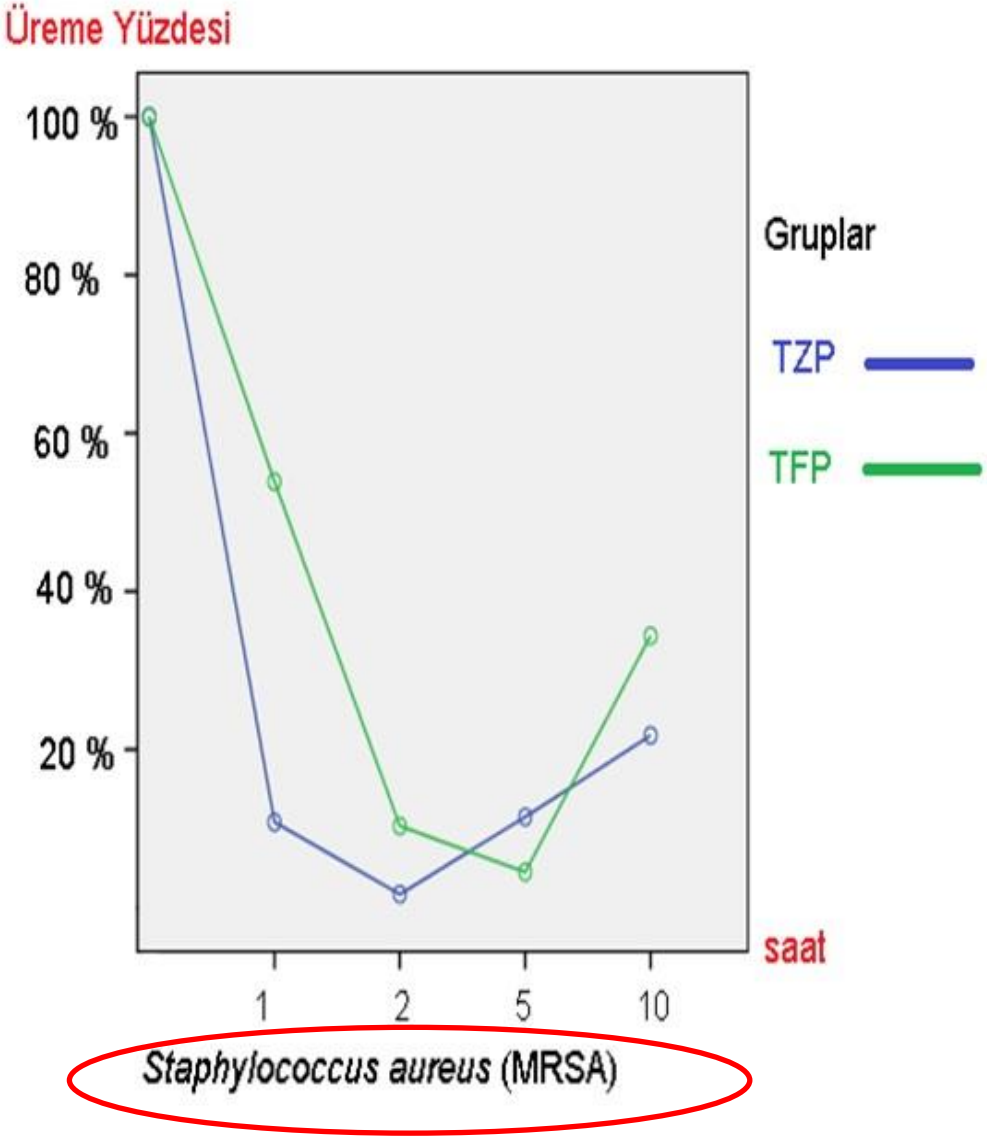


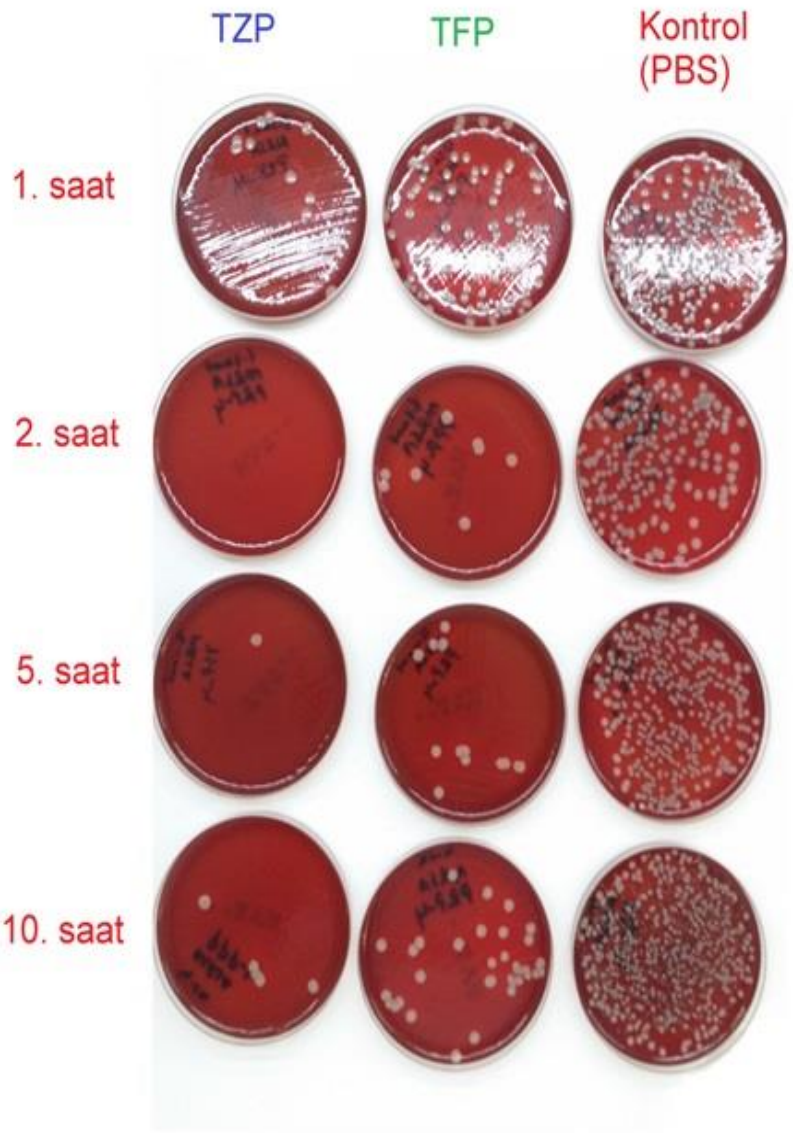
90 µl SF

8 numaralı kan bağışçısına ait plaklar

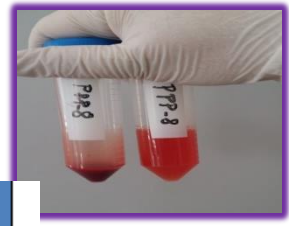


Bulgular


Üreme Yüzdesi
100 %
80 %
60 %
40 %
20 %
1
2
5
10
saat
Gruplar
TZP
TFP
Staphylococcus aureus (MRSA)


TZP
TFP
Kontrol (PBS)
1. saat
2. saat
5. saat
10. saat

Bulgular

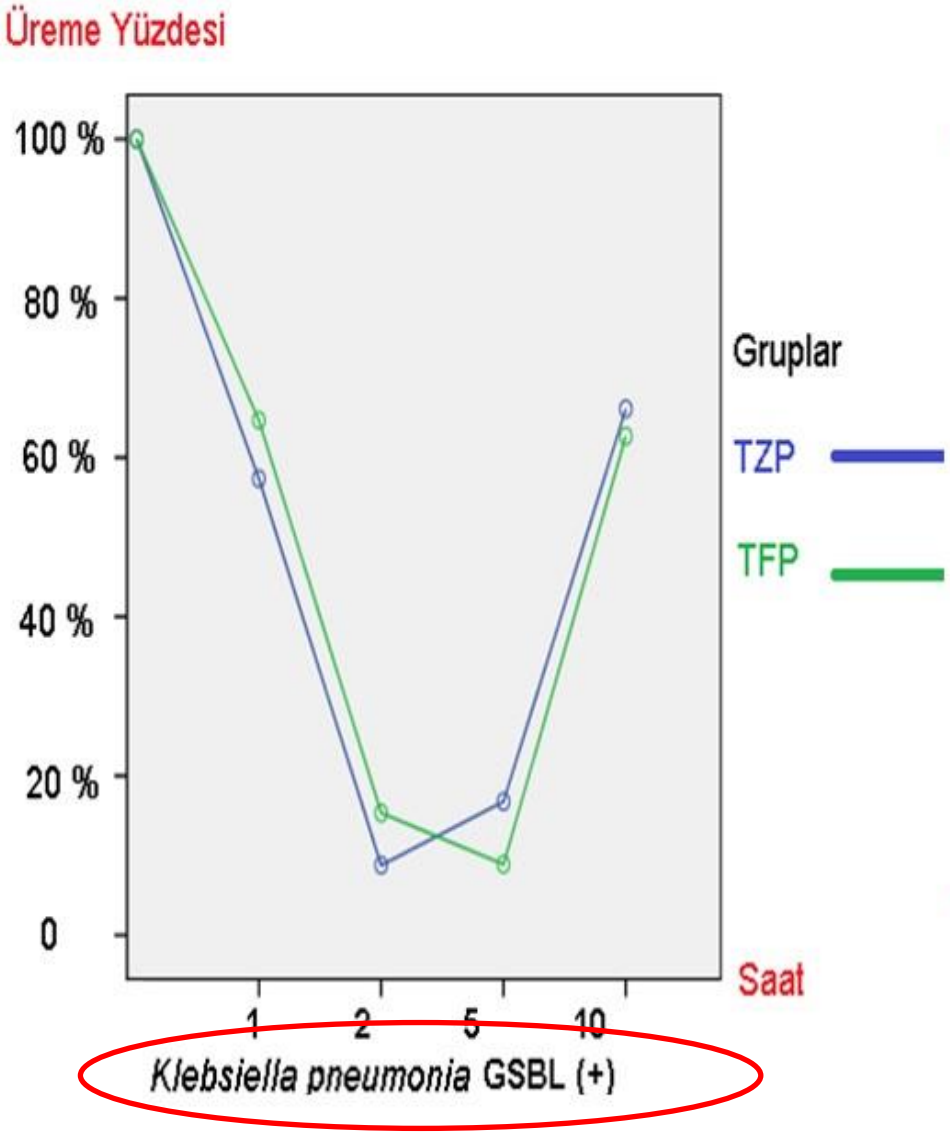


Bakteri	Zaman	TZP grup (Ortalama ± SD) x 10^4	TFP grup (Ortalama ± SD) x 10^4	PBS-Kontrol grup (Ortalama ± SD) x 10^4
MRSA	1. saat	5.8 ± 6.7 [a c]	39.1 ± 30.2 [b c]	95 ± 101
	2. saat	4.4 ± 9.3 [a]	19.4 ± 22.7 [b]	223 ± 131.8
	5. saat	19.6 ± 24.1 [a]	18.4 ± 20.2 [b]	660.9 ± 311
	10.saat	217.9 ± 299.4 [a]	343.8 ± 407.9 [b]	1000 ± 0
Klebsiella pneumoniae	1. saat	66.1 ± 78.9 [a]	69.4 ± 67.5 [b]	97.2 ± 72.7
	2. saat	27.9 ± 21.5 [a]	60.7 ± 64.7 [b]	307.6 ± 116.1
	5. saat	73.3 ± 77.7 [a]	107.8 ± 129.9 [b]	763.6 ± 361.4
	10.saat	642.8 ± 395.6 [a]	605 ± 473.2 [b]	923.1 ± 243.2
Pseudomonas aeruginosa	1. saat	18.5 ± 12.9 [a c]	31.6 ± 16.3 [b c]	43.1 ± 23.9
	2. saat	6.7 ± 8.8 [a]	10.2 ± 13.4 [b]	44 ± 34.4
	5. saat	10 ± 16.3 [a]	13.5 ± 23.6 [b]	85.7 ± 82.1
	10.saat	20 ± 26.3 [a]	40.3 ± 86 [b]	505.5 ± 433.7
VRE	1. saat	22.9 ± 17.2	24.5 ± 14. 6	22.1 ± 15.6
	2. saat	43.4 ± 45.3	41.1± 31.0 [b]	60.4 ± 36.6
	5. saat	178.2 ± 125.6	124.3 ± 106.8 [b]	218.4 ± 151.8
	10.saat	784.2 ± 416.2	719.8 ± 413.2	739.1 ± 434.2

Mann-Whitney U test, *p*: significance level, SD: standart sapma

[a] **Kontrol (PBS) - TZP < 0.05,** [b] **Kontrol (PBS) - TFP <0.05,** [c] **TFP-TZP <0 .05**

Bulgular


Üreme Yüzdesi
100 %
80 %
60 %
40 %
20 %
0
1
2
5
10
Saat
Gruplar
TZP
TFP
Klebsiella pneumonia GSBL (+)


TZP
TFP
Kontrol (PBS)
1. saat
2. saat
5. saat
10. saat

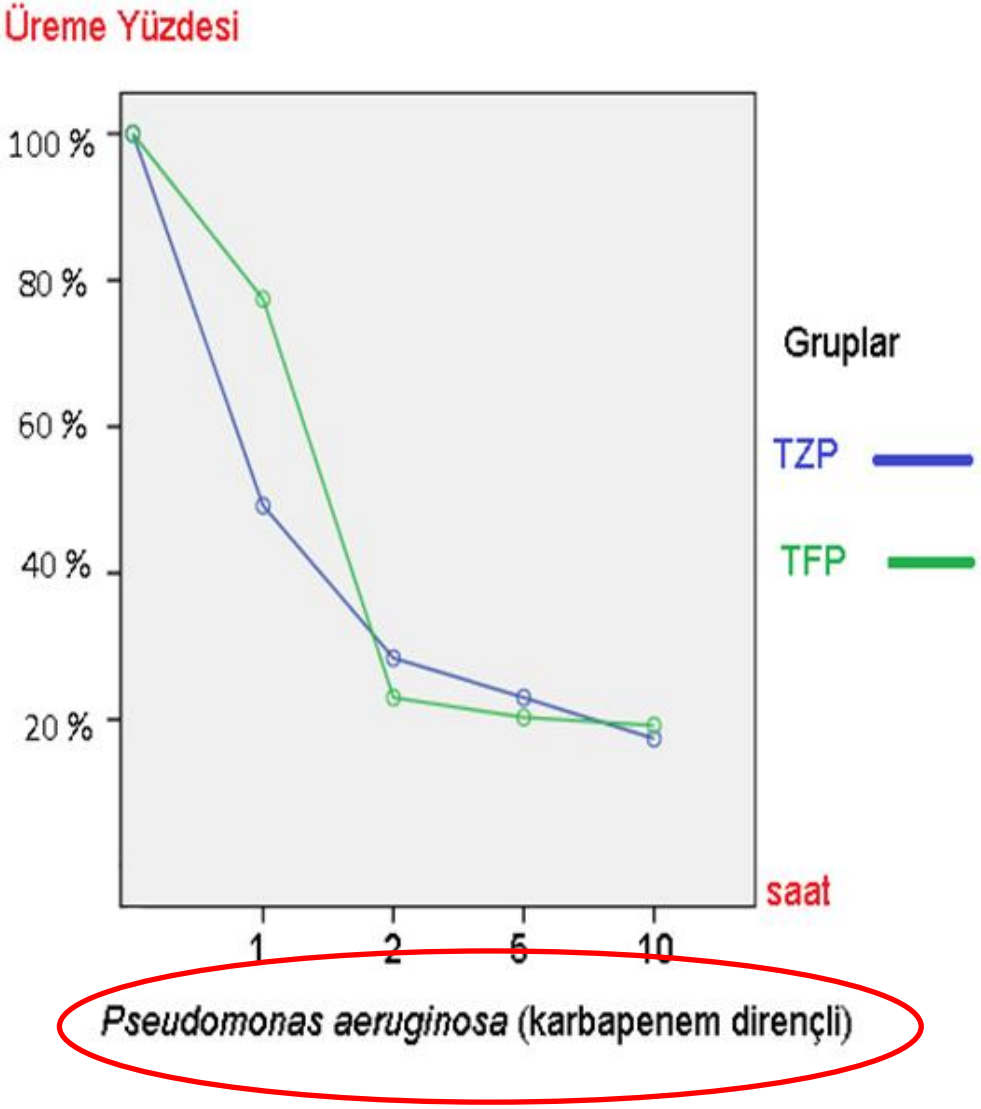
Bulgular

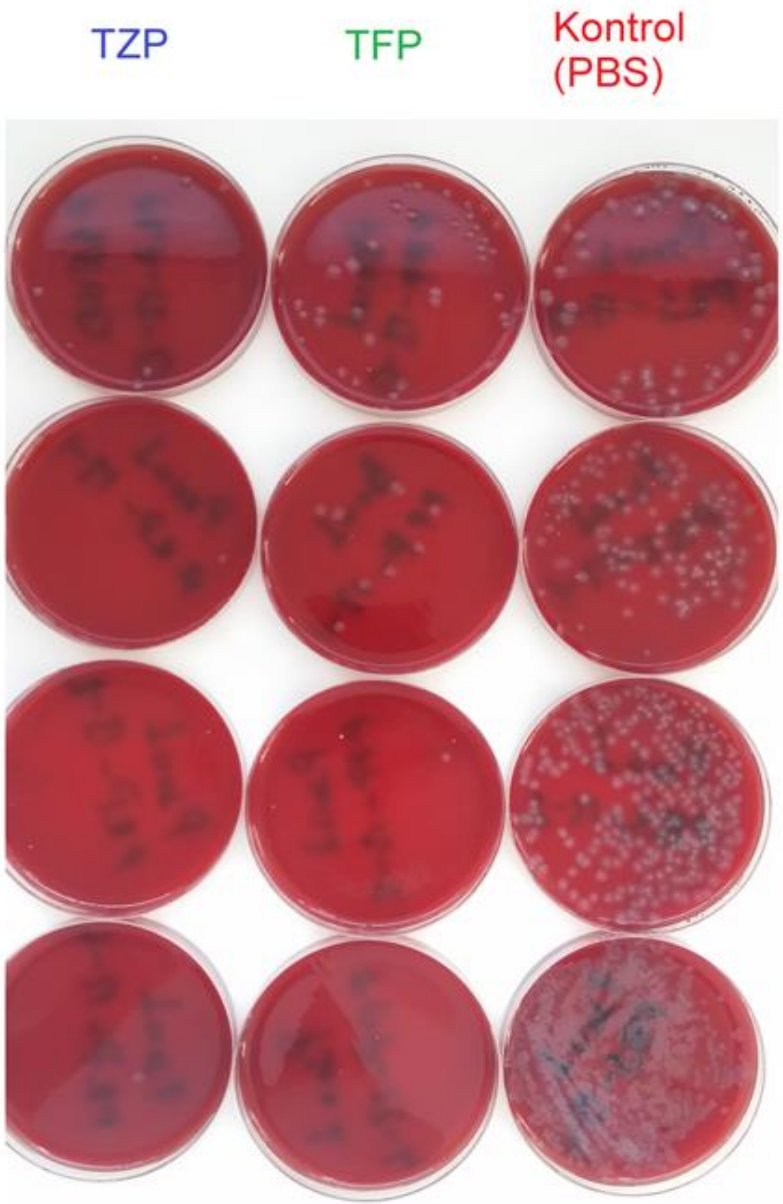
Bakteri	Zaman	TZP grup (Ortalama ± SD) x 10^4	TFP grup (Ortalama ± SD) x 10^4	PBS-Kontrol grup (Ortalama ± SD) x 10^4
MRSA	1. saat	5.8 ± 6.7 [a c]	39.1 ± 30.2 [b c]	95 ± 101
	2. saat	4.4 ± 9.3 [a]	19.4 ± 22.7 [b]	223 ± 131.8
	5. saat	19.6 ± 24.1 [a]	18.4 ± 20.2 [b]	660.9 ± 311
	10.saat	217.9 ± 299.4 [a]	343.8 ± 407.9 [b]	1000 ± 0
Klebsiella pneumoniae	1. saat	66.1 ± 78.9 [a]	69.4 ± 67.5 [b]	97.2 ± 72.7
	2. saat	27.9 ± 21.5 [a]	60.7 ± 64.7 [b]	307.6 ± 116.1
	5. saat	73.3 ± 77.7 [a]	107.8 ± 129.9 [b]	763.6 ± 361.4
	10.saat	642.8 ± 395.6 [a]	605 ± 473.2 [b]	923.1 ± 243.2
Pseudomonas aeruginosa	1. saat	18.5 ± 12.9 [a c]	31.6 ± 16.3 [b c]	43.1 ± 23.9
	2. saat	6.7 ± 8.8 [a]	10.2 ± 13.4 [b]	44 ± 34.4
	5. saat	10 ± 16.3 [a]	13.5 ± 23.6 [b]	85.7 ± 82.1
	10.saat	20 ± 26.3 [a]	40.3 ± 86 [b]	505.5 ± 433.7
VRE	1. saat	22.9 ± 17.2	24.5 ± 14. 6	22.1 ± 15.6
	2. saat	43.4 ± 45.3	41.1± 31.0 [b]	60.4 ± 36.6
	5. saat	178.2 ± 125.6	124.3 ± 106.8 [b]	218.4 ± 151.8
	10.saat	784.2 ± 416.2	719.8 ± 413.2	739.1 ± 434.2

Mann-Whitney U test, *p*: significance level, SD: standart sapma

[a] **Kontrol (PBS) - TZP < 0.05,** [b] **Kontrol (PBS) - TFP <0.05,** [c] **TFP-TZP <0 .05**

Bulgular


Üreme Yüzdesi
100 %
80 %
60 %
40 %
20 %
1
2
5
10
saat
Gruplar
TZP
TFP
Pseudomonas aeruginosa (karbapenem dirençli)


TZP
TFP
Kontrol
(PBS)

Bulgular

Bakteri	Zaman	TZP grup (Ortalama ± SD) x 10^4	TFP grup (Ortalama ± SD) x 10^4	PBS-Kontrol grup (Ortalama ± SD) x 10^4
MRSA	1. saat	5.8 ± 6.7 [a c]	39.1 ± 30.2 [b c]	95 ± 101
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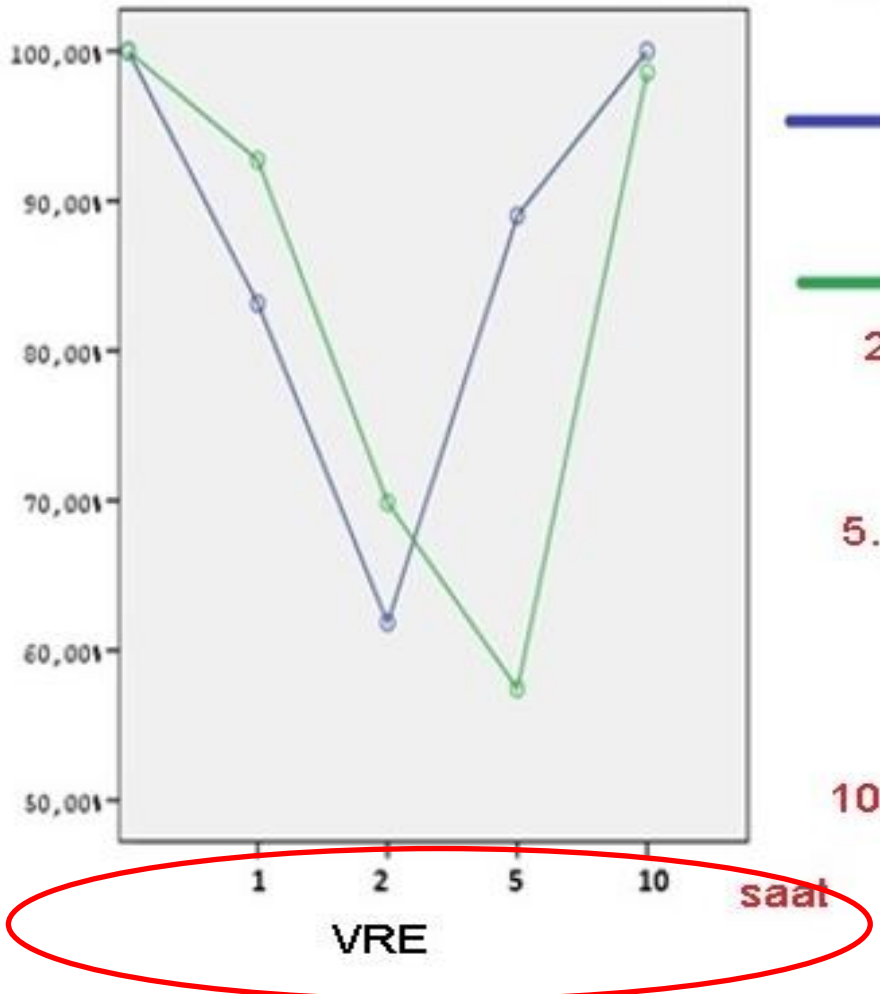
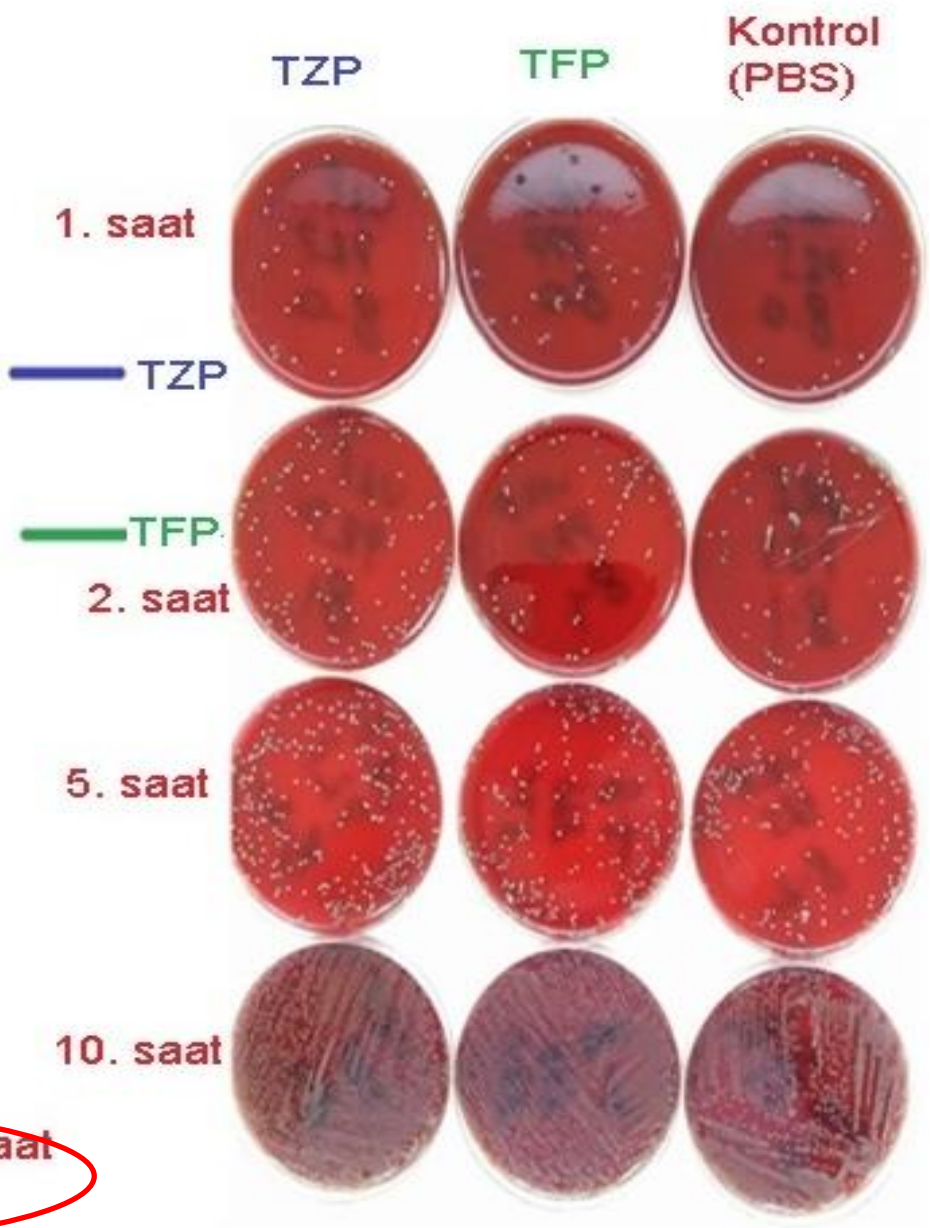
Mann-Whitney U test, *p*: significance level, SD: standart sapma

[a] **Kontrol (PBS) - TZP < 0.05,** [b] **Kontrol (PBS) - TFP <0.05,** [c] **TFP-TZP <0 .05**

Bulgular

D


Üreme Yüzdesi
100,00%
90,00%
80,00%
70,00%
60,00%
50,00%
1
2
5
10
saat
VRE


TZP
TFP
Kontrol (PBS)
1. saat
TZP
TFP
2. saat
5. saat
10. saat

Bulgular

Bakteri	Zaman	TZP grup (Ortalama ± SD) x 10^4	TFP grup (Ortalama ± SD) x 10^4	PBS-Kontrol grup (Ortalama ± SD) x 10^4
MRSA	1. saat	5.8 ± 6.7 [a c]	39.1 ± 30.2 [b c]	95 ± 101
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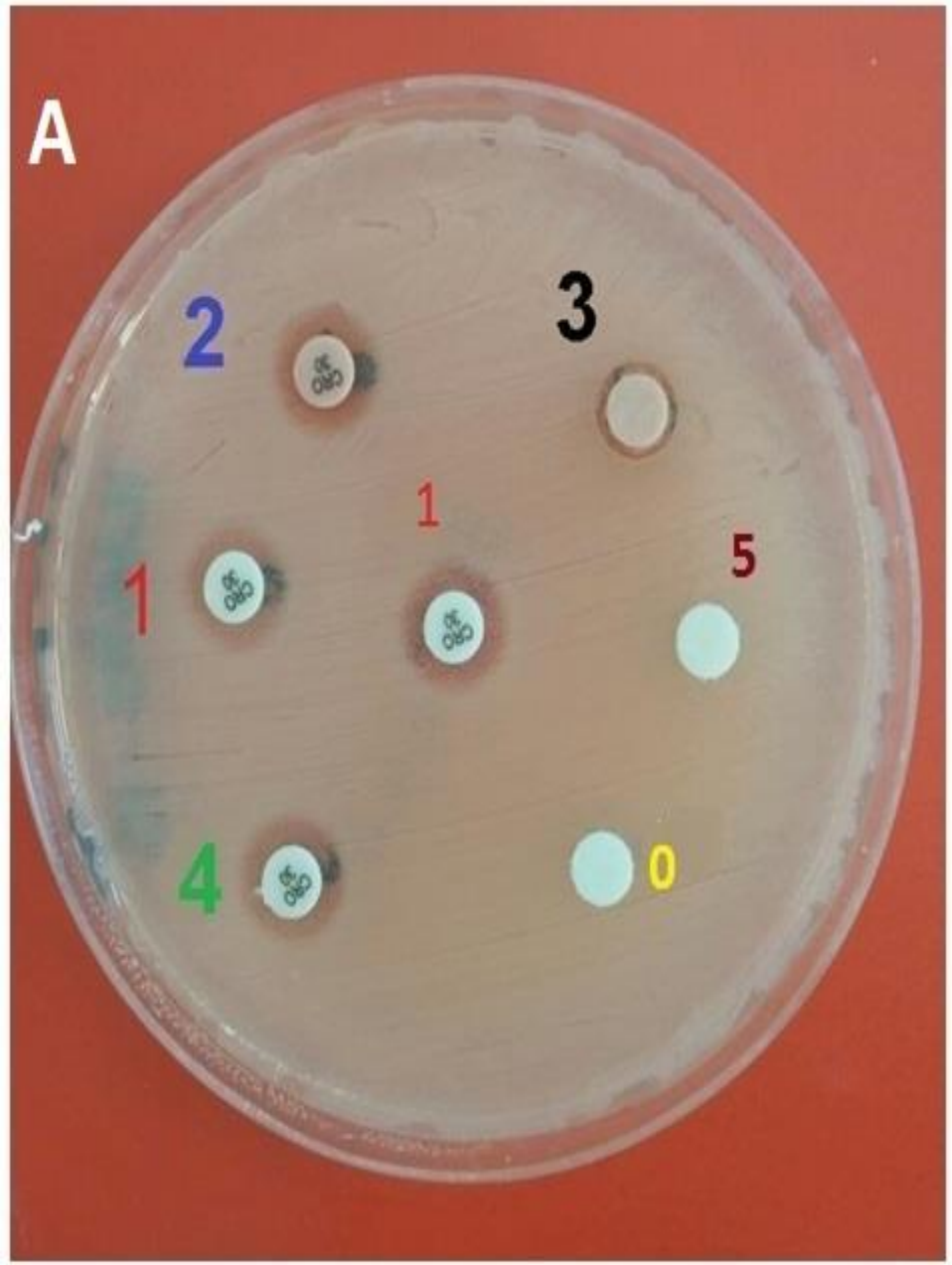
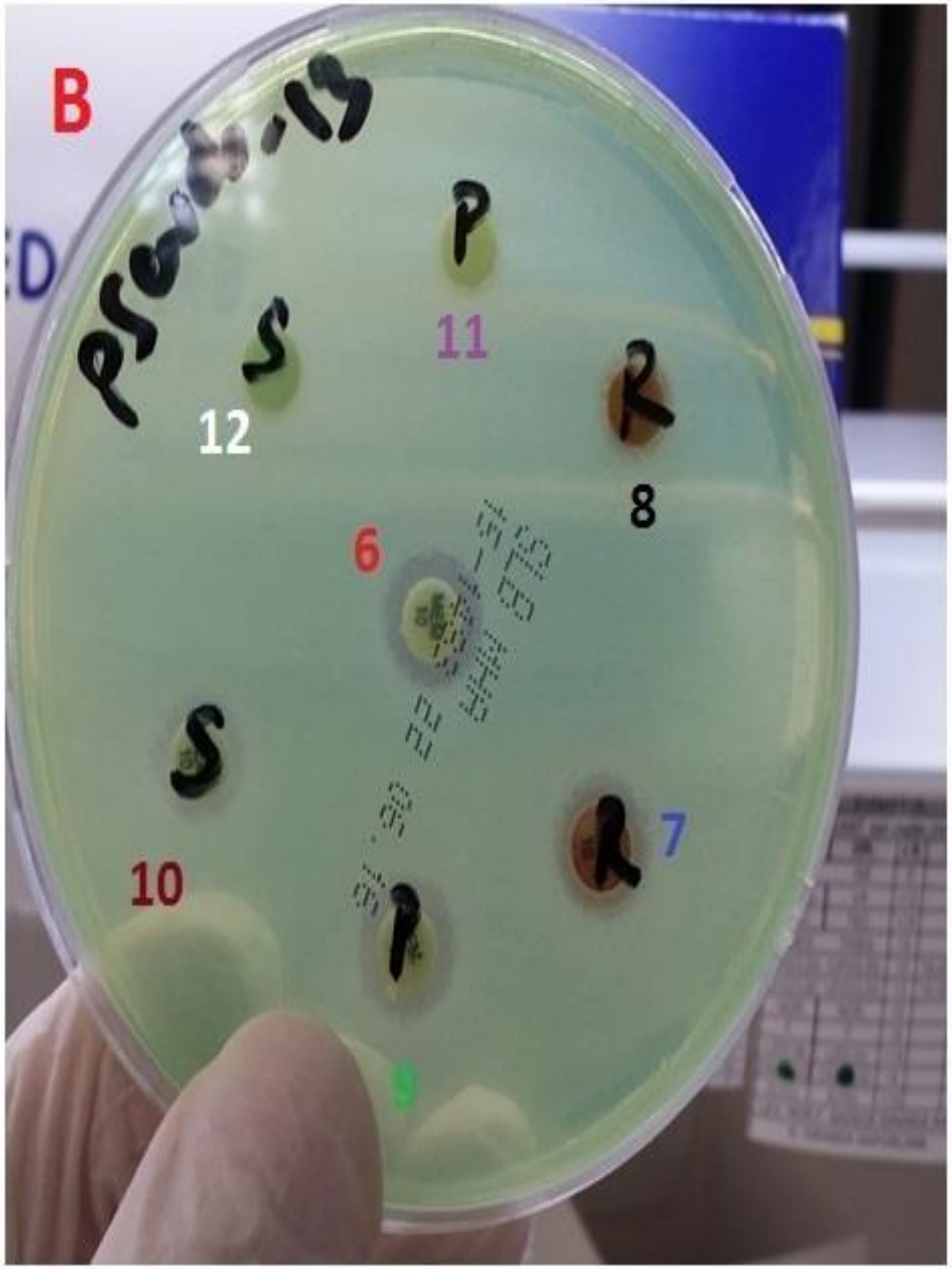
Mann-Whitney U test, *p*: significance level, SD: standart sapma

[a] **Kontrol (PBS) - TZP < 0.05,** [b] **Kontrol (PBS) - TFP <0.05,** [c] **TFP-TZP <0 .05**





***A: Klebsiella pneumoniae*,CRO: seftriakson** *diski, TZP: Trombositten Zengin Plazma,0: PBS emdirilmiş antibiyogram diski,1: CRO diski*
***2: TZP emdirilmiş CRO diski**, 3: TZP emdirilmiş boş antibiyogram diski, 4: TFP emdirilmiş CRO antibiyogram diski, 5: TFP emdirilmiş antibiyogram diski*

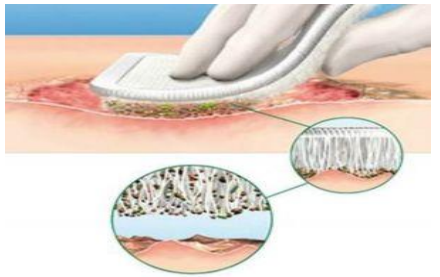
***B: Pseudomonas aeruginosa**, MEM:Meropenem diski, **R: Trombositen Zengin Plazma**, P: Trombositten Fakir Plazma, S:Kontrol (PBS), 6: Meropenem diski**, 7: TZP emdirilmiş MEM diski**, 8: TZP emdirilmiş boş antibiyogram diski, 9: TFP emdirilmiş MEM diski, 10:PBS emdirilmiş MEM diski, 11: TFP emdirilmiş boş antibiyogram diski*

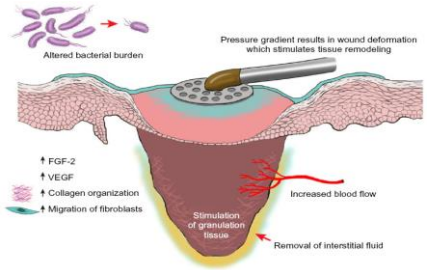
Mueller Hinton agarda (Merck, Germany) MRSA, *K. pneumoniae*, *P. aeruginosa* ve VRE medyan inhibisyon zonları.

	MRSA (mm)	*K. pneumoniae* (mm)	*P. aeruginosa* (mm)	VRE (mm)
TZP	6	**8**	**8**	**8**
TFP	6	6	6	6
PBS	6	6	6	6
TZP + Cefoxitin	**16**	-	-	-
TFP + Cefoxitin	15	-	-	-
PBS + Cefoxitin	15	-	-	-
Cefoxitin	15	-	-	-
TZP + Ceftriaxon	-	12	-	-
TFP + Ceftriaxon	-	12	-	-
PBS + Ceftriaxon	-	12	-	-
Ceftriaxon	-	12	-	-
TZP + Meropenem	-	-	11	-
TFP + Meropenem	-	-	11	-
PBS + Meropenem	-	-	11	-
Meropenem	-	-	11	-
TZP + Vancomycin	-	-	-	23
TFP + Vancomycin	-	-	-	23
PBS + Vancomycin	-	-	-	23
Vancomycin		-	-	23

Sonuç

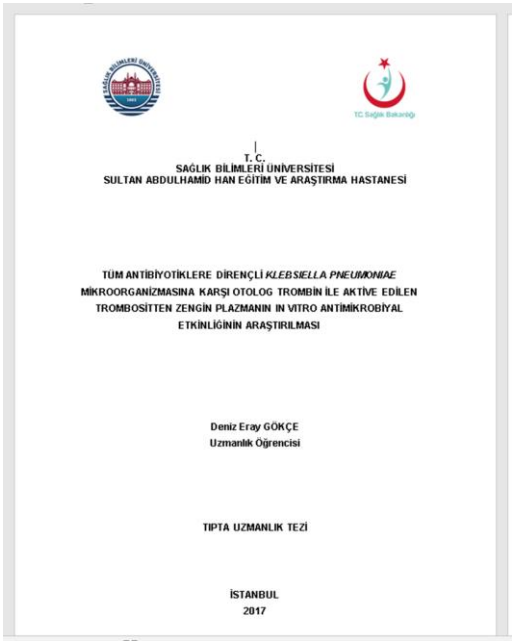
- Son 10 yıl
- Sık kullanılan antibiyotiklere direnç
- Tüm dünyada yaygın
- Yeni kullanıma sunulacak olan sınırlı antimikrobiyal molekül
- Yeni ve alternatif tedavi seçenekleri gerekli





Kısıtlılıklar

- Standart ATCC suşları ?
  - ***E. coli* ATCC 25922**
  - ***K. pneumoniae* ATCC 700603**



T. C.
SAĞLIK BİLİMLERİ ÜNİVERSİTESİ
SULTAN ABDULHAMİD HAN EĞİTİM VE ARAŞTIRMA HASTANESİ

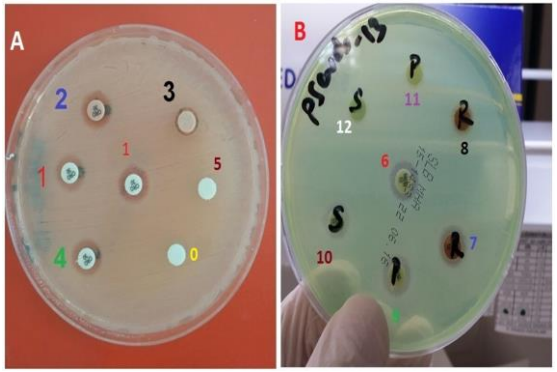
TÜM ANTİBİYOTİKLERE DİRENÇLİ *KLEBSIELLA PNEUMONIAE* MİKROORGANİZMASINA KARŞI OTOLOG TROMBİN İLE AKTİVE EDİLEN TROMBOSİTTEN ZENGİN PLAZMANIN IN VITRO ANTİMİKROBİYAL ETKİNLİĞİNİN ARAŞTIRILMASI

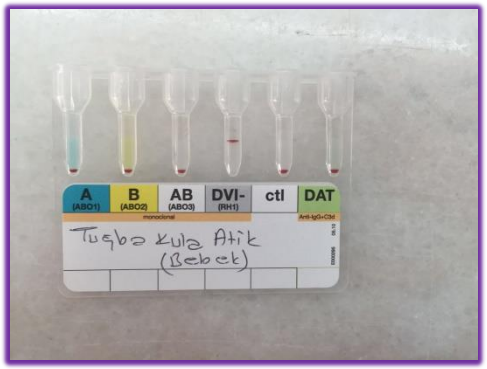
Deniz Eray GÖKÇE
Uzmanlık Öğrencisi

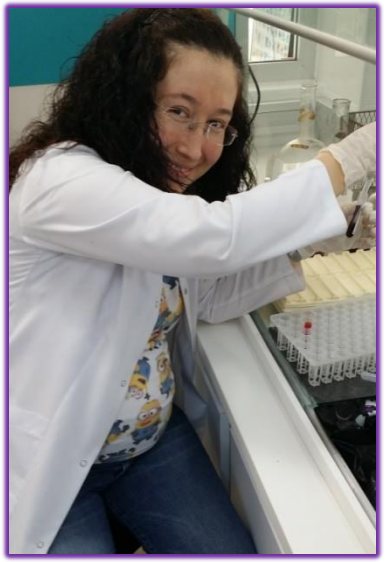
TIPTA UZMANLIK TEZİ

İSTANBUL
2017

- Boş antibiyogram diskleri ?
  - 10 µL ?




A
(ABO1)
B
(ABO2)
AB
(ABO3)
DVI-
(RH1)
ctl
DAT
monoclonal
Anti-IgG+C3d
Tuğba Kula Atik
(Bebek)



European Journal of Trauma and Emergency Surgery
pp 1–9 | Cite as

The efficacy of platelet-rich plasma gel in MRSA-related surgical wound infection treatment: an experimental study in an animal model

Authors | Authors and affiliations

R. A. Cetinkaya, S. Yilmaz, A. Ünlü, P. Petrone ✉, C. Marini, E. Karabulut, M. Urkan, E. Kaya, K. Karabacak, M. Uyanik, I. Eker, A. Kilic, A. Gunal

Original Article
First Online: 30 September 2017

T. C.
SAĞLIK BİLİMLERİ ÜNİVERSİTESİ
GÜLHANE SAĞLIK BİLİMLERİ ENSTİTÜSÜ
ANKARA

OTOLOG TROMBİN VE KALSİYUM GLUKONAT İLE AKTİVE EDİLEN PLATELETTEN ZENGİN PLAZMANIN ÇOKLU İLAÇ DİRENCİNE (ÇİD) SAHİP *ACINETOBACTER BAUMANNII* MİKROORGANİZMASINA KARŞI ANTİBAKTERİYEL ETKİNLİĞİNİN IN VITRO ARAŞTIRILMASI

Rıza Aytaç ÇETİNKAYA
Yardımcı Doçent Doktor

YÜKSEK LİSANS TEZİ

ANKARA
2016

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Platelet Rich Plasma as an Additional Therapeutic Option for Infected Wounds with Multi-Drug Resistant Bacteria: In Vitro Antibacterial Activity Study

Riza Aytac Cetinkaya[1], Ercan Yenilmez[1], Patrizio Petrone[2], Soner Yılmaz[3], Bayhan Bektore[4], Berksan Simsek[5], Tugba Kula Atik[6], Mustafa Ozyurt[7], Aytekin Ünlü[8]

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T. C.
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SULTAN ABDULHAMİD HAN EĞİTİM VE ARAŞTIRMA HASTANESİ

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Deniz Eray GÖKÇE
Uzmanlık Öğrencisi

TIPTA UZMANLIK TEZİ

İSTANBUL
2017

Bundesärztekammer
(German Medical Association)

Cross-Sectional Guidelines for Therapy with Blood Components and Plasma Derivatives

Published by: Executive Committee of the German Medical Association on the recommendation of the Scientific Advisory Board

4th revised and updated edition
2014

Taking the contraindications into account, application of MAT can be recommended when major blood loss is anticipated as well as when acute bleeding occurs during surgery.	1 C+
In tumor surgery the application of MAT can be recommended, when the blood shed from the wound is irradiated prior to retransfusion.	2 C+

10.1.2 Storage and shelf life

Autologous red blood cell preparations are principally to be stored at +2 to +6°C clearly separated from homologous blood products.
Blood derived from hemodilution or MAT must be retransfused as soon as possible if indicated. The maximum time span between collection and transfusion is 6 hours.

10.1.3 Range of application, dosage and mode of administration

Autologous whole blood concentrates and RBC concentrates are prescription-only medical products and therefore an integral part of medical treatment [11]. Indications for transfusion differ in no way from those for homologous preparations. This also applies to RBC concentrates obtained in the context of acute normovolemic hemodilution.

10.1.4 Adverse reactions

See chapter 11.

10.1.5 Documentation, informed consent

Documentation of administration is done according to article 14 German Transfusion Act (TFG) (patient data, batch number, identification of the preparation, volume administered, time and date of collection, adverse reactions). The German Guide for Hemotherapy should be considered [11].
Before autologous blood donation the patient is to be informed in writing about the individual risk-benefit ratio involved in donating and receiving autologous blood components and about the possibility that homologous blood components may still have to be transfused.

10.2 Autologous platelet preparations, autologous fresh frozen plasma (AFFP), autologous fibrin glue, autologous platelet-rich plasma (APRP)

The use of these blood products is based on reports from isolated centers and is limited to only a few indications. Controlled prospective studies have not been performed. Therefore, no recommendations concerning indications, dosage, quality requirements or mode of administration can be made.

10.2.1 Autologous platelet concentrates

This application is restricted to specific indications.
Autologous platelet concentrates have been used by ophthalmologists to treat macular holes [21, 22, 28]. Single reports have been published about the use of autologous PC in cardiac surgery [52] and as supportive treatment in high dose chemotherapy [45].

10.2.2 Autologous fresh frozen plasma (AFFP)

In the production of autologous RBC concentrates AFFP is routinely produced as part of the separation process and is available during or after surgery [11]. Indications for FFP are described in ch. 4. In elective surgery in which high blood losses can be anticipated (e.g. revision of total hip arthroplasty, spinal surgery), the presurgical collection of several units of AFFP via plasmapheresis in combination with intraoperative MAT is a well-established means of providing "physiological" fluid replacement perioperatively, even in the event of massive blood loss.

10.2.3 Autologous fibrin glue

Various working groups have reported on the preparation and use of autologous fibrin glue in surgery [13, 44, 49]. Standard methods have not yet been established [46].

10.2.4 Autologous platelet-rich plasma (APRP)

Autologous platelet-rich plasma (APRP) is obtained from small amounts (around 10–80 mL) of autologous blood by centrifugation. Usually it is mixed with a few drops of blood from the wound and human bone material or synthetic bone substitute material and is used for filling bone defects in dentistry. The only prospective trial published so far [30] as well as a few case studies or data from animal experiments who reported benefits [1, 16, 47] or no significant effect [17, 19, 36] in the application of APRP or PRP in bone graft surgery do not allow to make recommendations for application beyond clinical trials. Randomized trials on the efficacy of APRP are still lacking.

A general application of autologous platelet-rich plasma beyond clinical trials is not recommended.	2 C

10.3 Autologous stem cell preparations

The German Guide for Obtaining Blood and Blood Components and for Application of Blood Products (Hemotherapy) [11], the guides for transplantation of peripheral blood stem cells [9], for bone marrow transplantation [8] and cord blood stem cells [10] as well as the recommendations of the German Society for Transfusion Medicine and Immunohaematology on blood stem cell apheresis [14] should be observed.

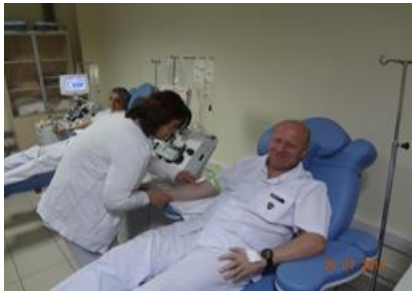
10.4 Documentation

See section 10.1.5.

10.5 References

[1] Akeda K, An HS, Pichika R, et al. Platelet-rich plasma (PRP) stimulates the extracellular matrix metabolism of porcine nucleus pulposus and anulus fibrosus cells cultured in alginate beads. Spine 2006; 31:959–66.
[2] Axelrod FB, Pepkowitz SH, Goldfinger D. Establishment of a schedule of optimal preoperative collection of autologous blood. Transfusion 1989; 29:677–80.
[3] Bauermann E, Siemers A, Linde I. Qualitätssicherung beim Konzept der autologen Transfusion aus anästhesiologischer Sicht. Hämatologie 1997; 6:136–49.

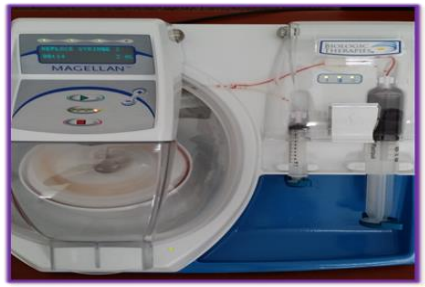
Giriş



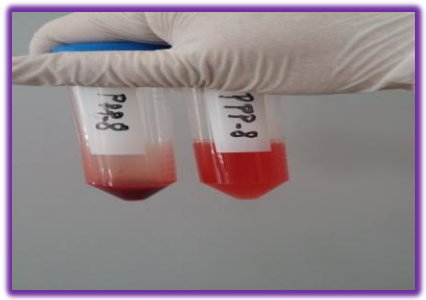
Trombosit süsp.

Aferez / Random

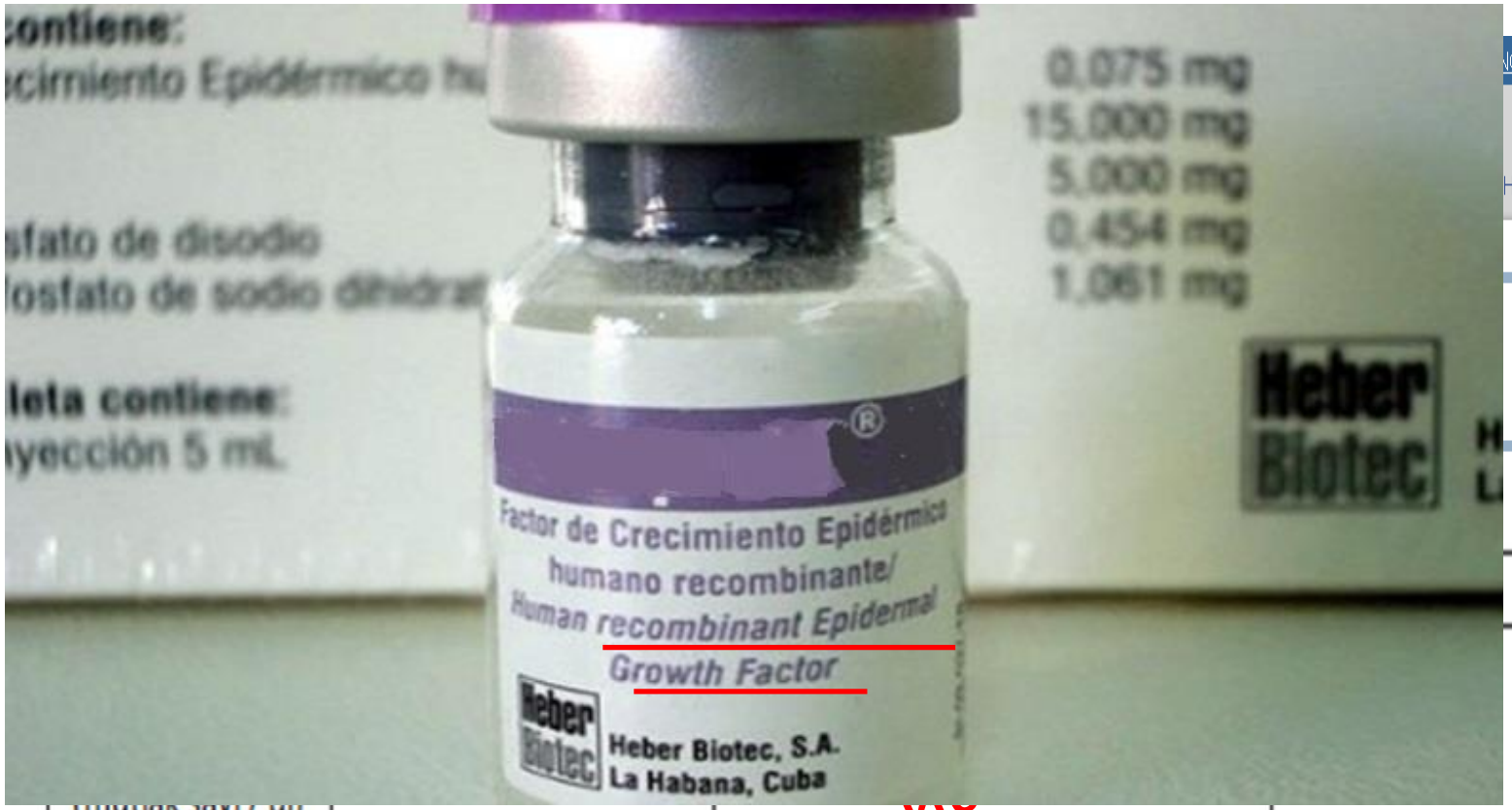
Hemostaz



Trombosit süsp.=Trombositten Zengin Plazma
= Platelet Rich Plasma =PRP



PRP= PRP x10 (FTR, Ortopedi, Cildiye vb.)

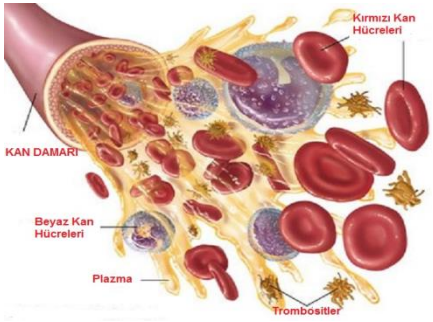


PDGF (pg/mL)	96,49 ± 49	550,96 ± 73,6	0,0001
Viabilite (%)	94 ± 7,5	68,2 ± 13,7	0,0001

4 büyüme fakt

Trombosit

Doku hasarı ve mikrobiyal tehdit



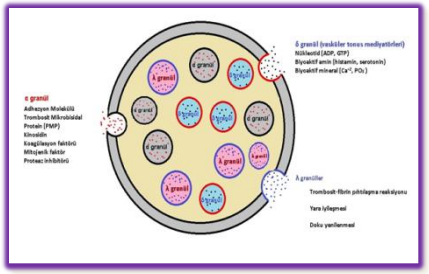
Nöbetçi, gardiyan, bekçi

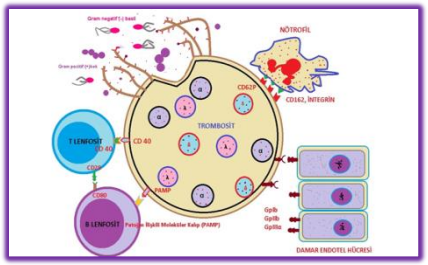
Mikroorganizma varlığını tespit etme yeteneği

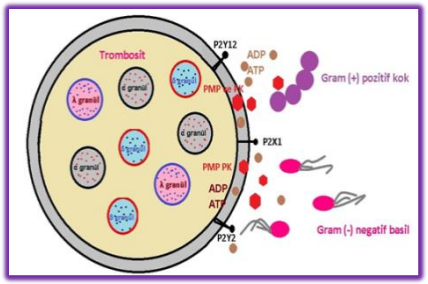
Yeaman MR. Platelets: at the nexus of antimicrobial defence. Nat Rev Microbiol. 2014

Konak Savunma

- ✓ Son 10 yıl
- ✓ Konak patojen ilişkisi yeni teknikler
- ✓ Protein kimyası ve moleküler biyoloji gelişmesi
- ✓ Antimikrobiyal özellikle 1887 yılında [1]

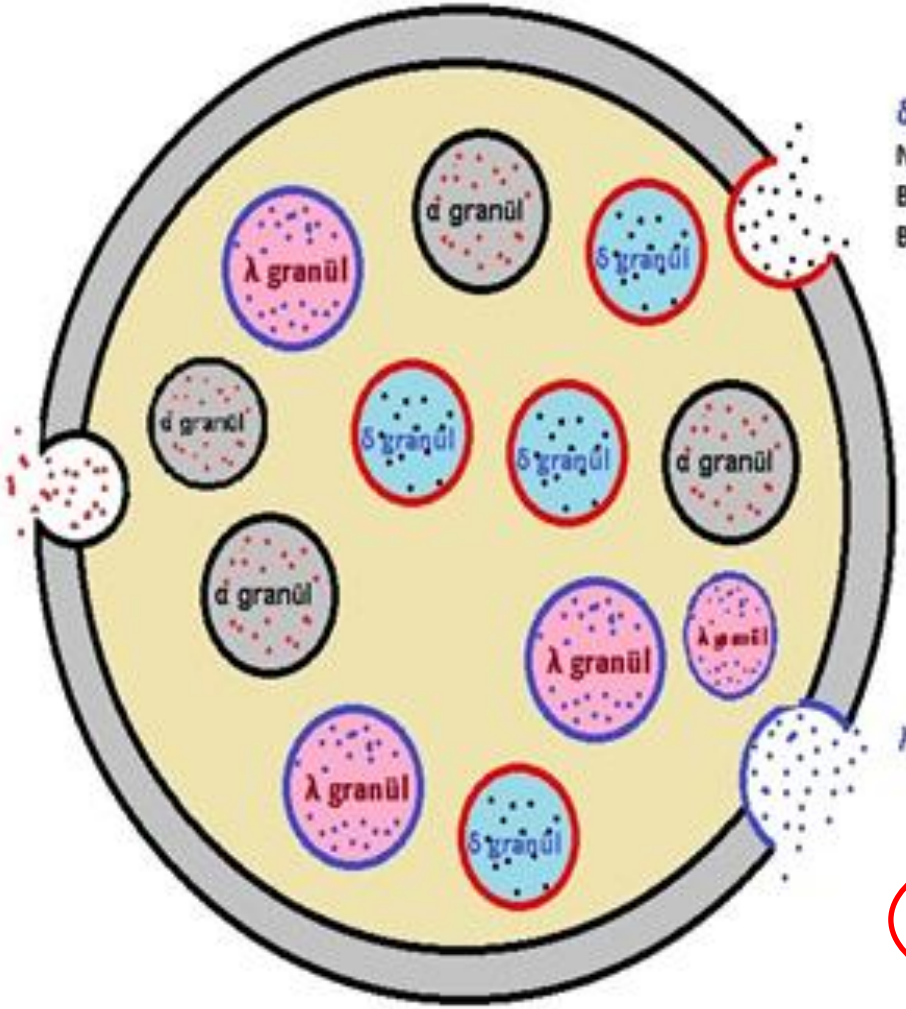




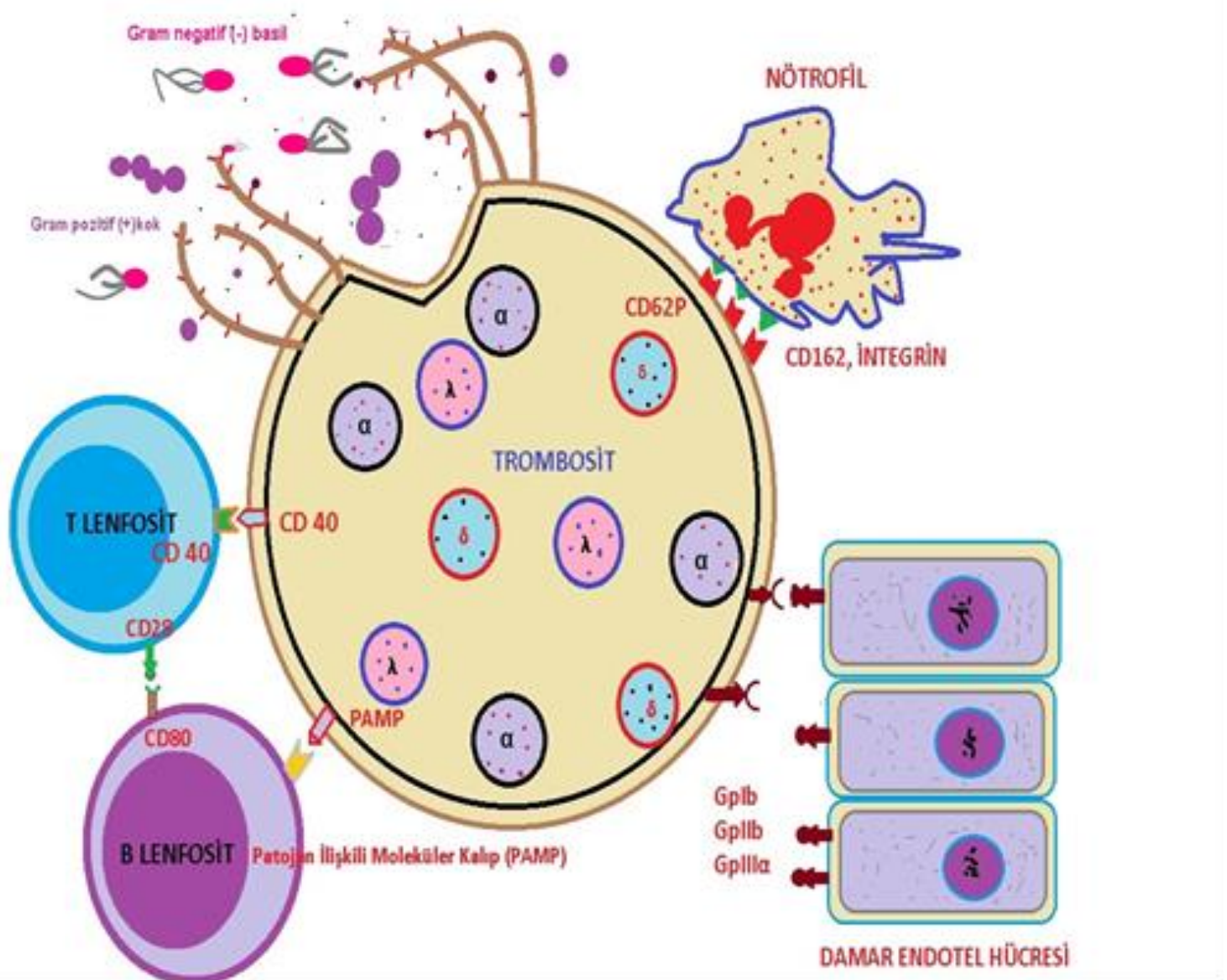


[1] Fodor J. Die fahigkeit des blutes bakterien zu vernichten. Dtsch Med Wochenschr 1887

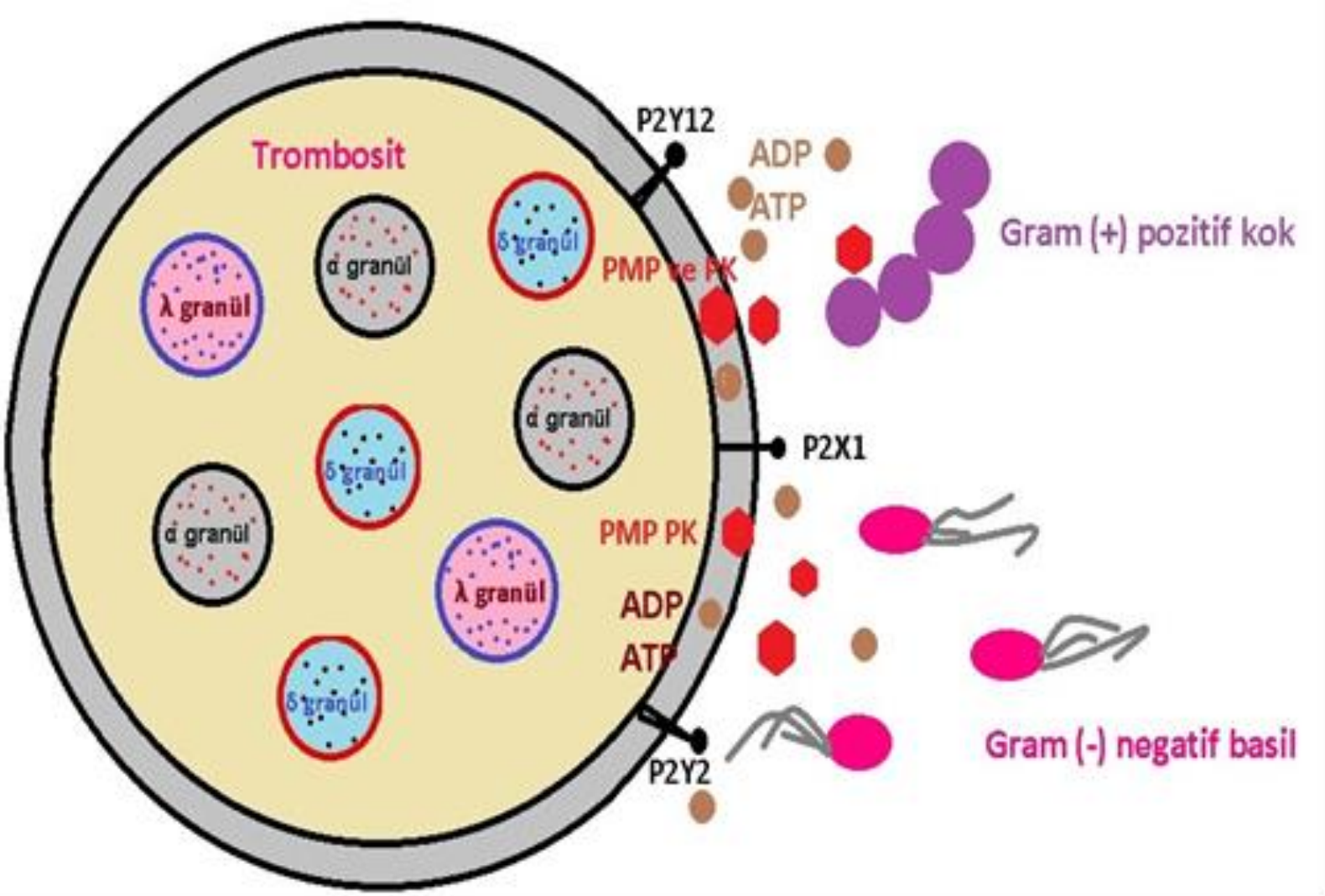
Konak Savunma



Konak Savunma

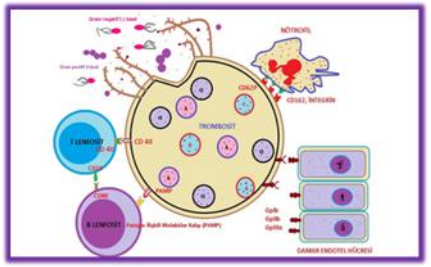


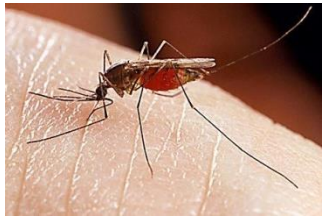
Konak Savunma

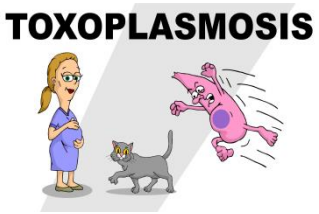


Konak Savunma

- ✓ Bakteriyostatik [1]
- ✓ Bakterisidal [2]
- ✓ Antimikrobisidal aktivite
  - Viral [3] HIV-1
  - Bakteriyel
  - Fungal [4]
  - Protozoa [5]



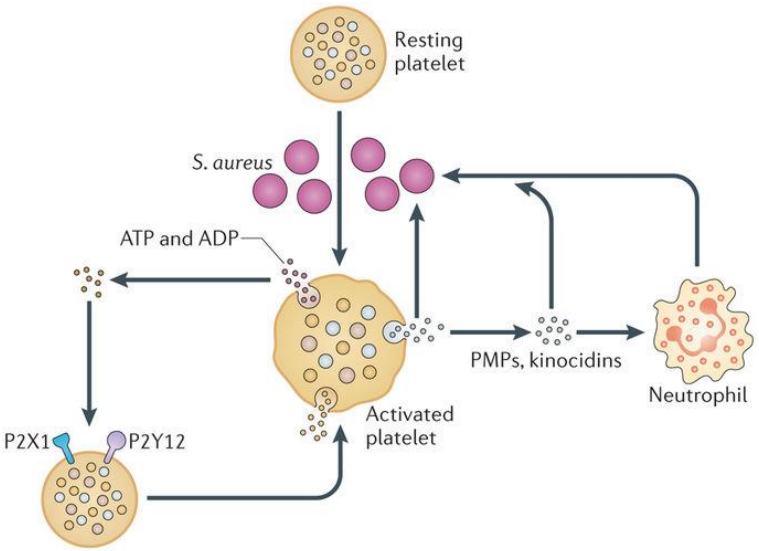


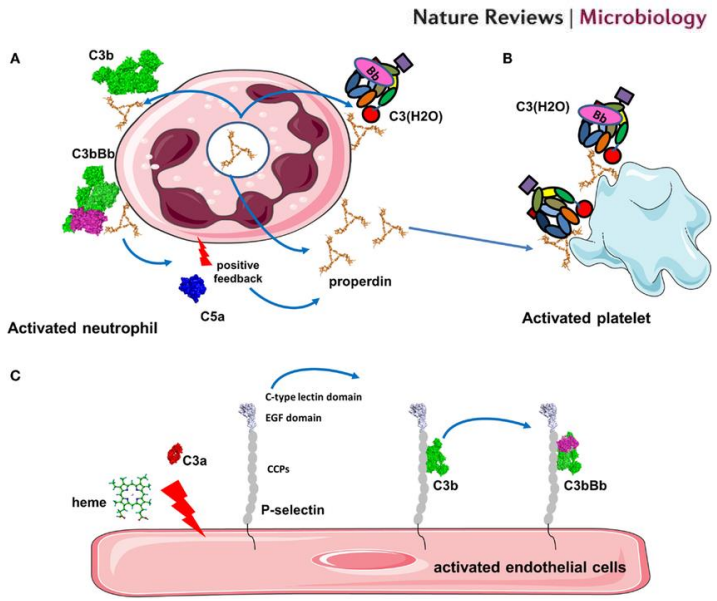


1 Yeaman MR. Platelets: at the nexus of antimicrobial defence. Nat Rev Microbiol. 2014
3 Solomon Tsegaye T. Platelet activation suppresses HIV-1 infection of T cells. Retrovirology. 2013
4 Perkhofer S. Human platelets attenuate Aspergillus species via granule-dependent mechanisms. J Infect Dis. 2008
5 Chumpitazi BF. Human platelet inhibition of Toxoplasma gondii growth. Clin Exp Immunol. 1998

Trombositler Kemokin-Kinosidin

- Bakteri spesifik proteinler
  - N-formile peptidler
  - Trombositler üzerindeki N-formil peptid reseptörler
- Kompleman proteinleri (C3a ve C5a)
  - C, CC, CXC ve CX3C
- Kinosidin = mikrobisidal kemokinler



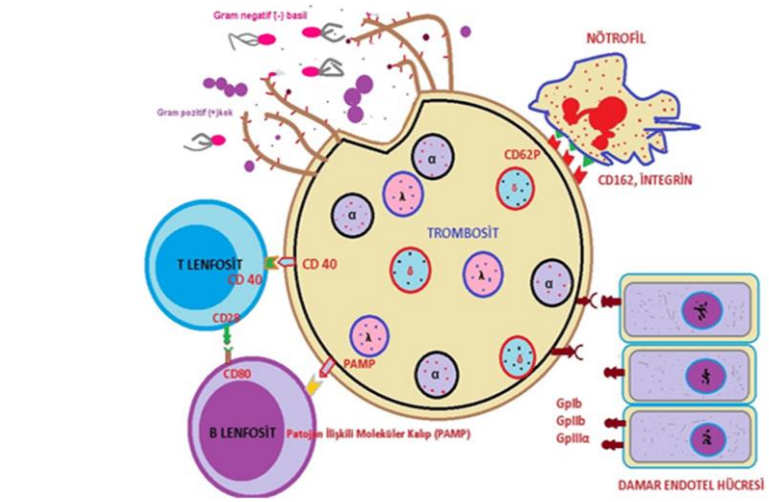


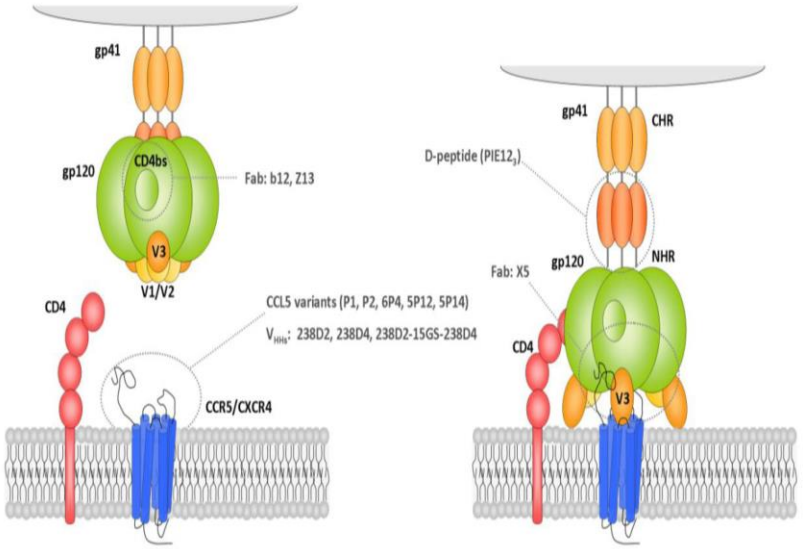
Yeaman MR. Platelets: at the nexus of antimicrobial defence. Nat Rev Microbiol. 2014;12(6):426-37

Trombositler Virüsler
HIV

- Trombosit- Virüs
  - CXCL4: Trombosit Faktör 4 (PF-4)

- T lenfositlerdeki HIV-1 enfeksiyonunu
  - Tsegaye ve ark. in vitro inhibe
  - Cocchi ve ark. majör HIV baskılayıcı faktör CCL5 kinosidin
  - HIV-1 gp120 zarf protein





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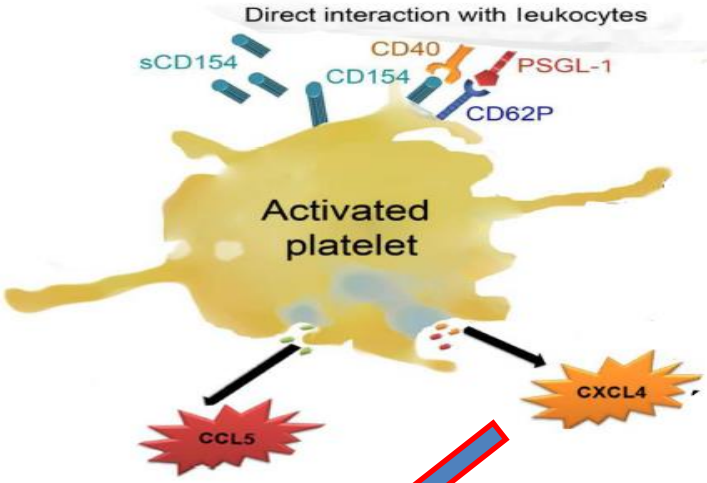
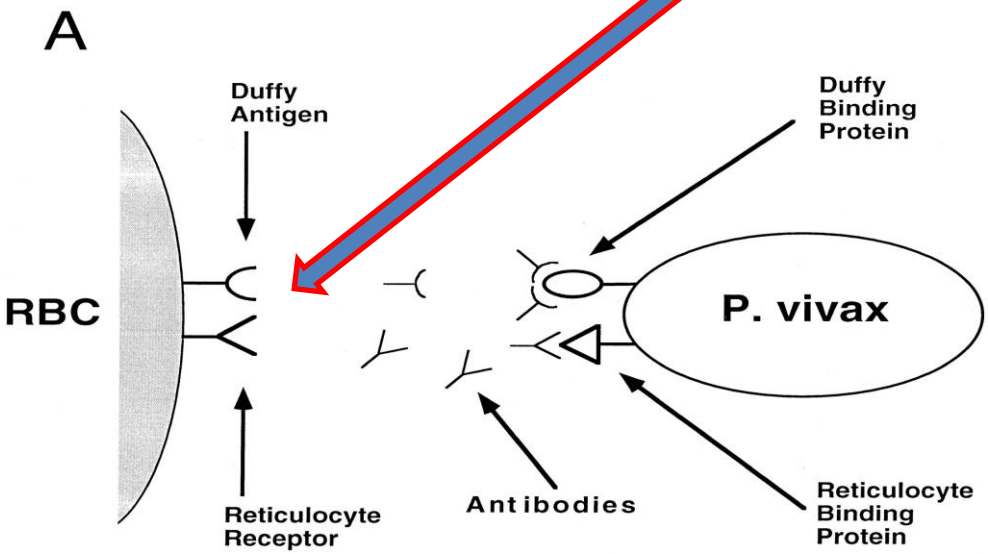
Cocchi F. The V3 domain of the HIV-1 gp120 envelope glycoprotein is critical for chemokine-mediated blockade of infection. Nat Med. 1996;2(11):1244-7.

Trombositler Protozoalara

- Trombosit- Plasmodium falciparum
  - CXCL4: Trombosit Faktör 4 (PF-4)

- Duffy antijen reseptörü (DARC, Fy)
  - Eritrositler içinde birikim
  - Sindirim vakuolünün lizis etkisi





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DUYURULAR »

DİYABETİK AYAK YARASI VE İNFEKSİYONU UZLAŞI RAPORU KLİMİK DERGİSİ 2015; CİLT 27 (SUPPL. 1)'DE YAYIMLANDI

Rapor İçin [Tıklayınız]

Klinik Kullanım

Diyabetik ayak enfeksiyonlarında TZP kullanımı 2 farklı görüş

1. Görüş

   d'Hemecourt P ve ark.
   Smiell ve ark.
   Robson ve ark.

   } İstatistiksel anlamsız

2. Görüş

   Steed ve ark.
   Wieman ve ark.

   } İyileşme, İstatistiksel anlamlı

Hemecourt P. Sodium carboxymethylcellulose aqueous-based gel vs. becaplermin gel in patients with nonhealing lower extremity diabetic ulcers. Wounds. 1998

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Tartışma

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Steed DL. Clinical evaluation of recombinant human platelet-derived growth factor for the treatment of lower extremity diabetic ulcers. Diabetic Ulcer Study Group. J Vasc Surg. 1995;21(1):71-8; discussion 9-81.

Wieman TJ. Efficacy and safety of a topical gel formulation of recombinant human platelet-derived growth factor-BB (becaplermin) in patients with chronic neuropathic diabetic ulcers. A phase III randomized placebo-controlled double-blind study. Diabetes Care. 1998

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Stem Cell Res Ther. 2013 Jun 7;4(3):67. doi: 10.1186/scrt218.

Platelet-rich plasma preparation for regenerative medicine: optimization and quantification of cytokines and growth factors.

Amable PR, Carias RB, Teixeira MV, da Cruz Pacheco I, Corrêa do Amaral RJ, Granjeiro JM, Borojevic R.

Abstract

INTRODUCTION: Platelet-rich plasma (PRP) is nowadays widely applied in different clinical scenarios, such as orthopedics, ophthalmology and healing therapies, as a growth factor pool for improving tissue regeneration. Studies into its clinical efficiency are not conclusive and one of the main reasons for this is that different PRP preparations are used, eliciting different responses that cannot be compared. Platelet quantification and the growth factor content definition must be defined in order to understand molecular mechanisms behind PRP regenerative strength. Standardization of PRP preparations is thus urgently needed.

METHODS: PRP was prepared by centrifugation varying the relative centrifugal force, temperature, and time. Having quantified platelet recovery and yield, the two-step procedure that rendered the highest output was chosen and further analyzed. Cytokine content was determined in different fractions obtained throughout the whole centrifugation procedure.

RESULTS: Our method showed reproducibility when applied to different blood donors. We recovered 46.9 to 69.5% of total initial platelets and the procedure resulted in a 5.4-fold to 7.3-fold increase in platelet concentration (1.4 × 10(6) to 1.9 × 10(6) platelets/μl). Platelets were highly purified, because only <0.3% from the initial red blood cells and leukocytes was present in the final PRP preparation. We also quantified growth factors, cytokines and chemokines secreted by the concentrated platelets after activation with calcium and calcium/thrombin. High concentrations of platelet-derived growth factor, endothelial growth factor and transforming growth factor (TGF) were secreted, together with the anti-inflammatory and proinflammatory cytokines interleukin (IL)-4, IL-8, IL-13, IL-17, tumor necrosis factor (TNF)-α and interferon (IFN)-α. No cytokines were secreted before platelet activation. TGF-β3 and IFNγ were not detected in any studied fraction. Clots obtained after platelet coagulation retained a high concentration of several growth factors, including platelet-derived growth factor and TGF.

CONCLUSIONS: Our study resulted in a consistent PRP preparation method that yielded a cytokine and growth factor pool from different donors with high reproducibility. These findings support the use of PRP in therapies aiming for tissue regeneration, and its content characterization will allow us to understand and improve the clinical outcomes.

PMID: 23759113 PMCID: PMC3706762 DOI: 10.1186/scrt218

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Platelet-Rich Plasma Activates Proinflammatory Signaling Pathways and [Am J Sports Med. 2016]

- Amable ve ark. g, santrifüj süresi, santrifüj ısısı ve çift devirli santrifüj vb.
- 17 farklı kombinasyon x0,6 x5,2

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J Periodontol. 2015 Feb;86(2):310-8. doi: 10.1902/jop.2014.140373. Epub 2014 Oct 27.

Antimicrobial activity of platelet-rich plasma and other plasma preparations against periodontal pathogens.

Yang LC[1], Hu SW, Yan M, Yang JJ, Tsou SH, Lin YY.

Author information

Abstract

BACKGROUND: In addition to releasing a pool of growth factors during activation, platelets have many features that indicate their role in the anti-infective host defense. The antimicrobial activities of platelet-rich plasma (PRP) and related plasma preparations against periodontal disease-associated bacteria were evaluated.

METHODS: Four distinct plasma fractions were extracted in the formulation used commonly in dentistry and were tested for their antibacterial properties against three periodontal bacteria: Porphyromonas gingivalis, Aggregatibacter actinomycetemcomitans, and Fusobacterium nucleatum. The minimum inhibitory concentration of each plasma preparation was determined, and in vitro time-kill assays were used to detect their abilities to inhibit bacterial growth. Bacterial adhesion interference and the susceptibility of bacterial adherence by these plasma preparations were also conducted.

RESULTS: All plasma preparations can inhibit bacterial growth, with PRP showing the superior activity. Bacterial growth inhibition by PRP occurred in the first 24 hours after application in the time-kill assay. PRP interfered with P. gingivalis and A. actinomycetemcomitans attachment and enhanced exfoliation of attached P. gingivalis but had no influences on F. nucleatum bacterial adherence.

CONCLUSIONS: PRP expressed antibacterial properties, which may be attributed to platelets possessing additional antimicrobial molecules. The application of PRP on periodontal surgical sites is advisable because of its regenerative potential and its antibacterial effects.

KEYWORDS: Anti-bacterial agents; microbial sensitivity tests; oral surgical procedures; periodontal diseases; platelet-rich plasma

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Cytotherapy. 2014 Sep;16(9):1294-304. doi: 10.1016/j.jcyt.2014.06.003.

Platelet-rich plasma affects bacterial growth in vitro.

Mariani E[1], Filardo G[2], Canella V[3], Berlingeri A[4], Bielli A[4], Cattini L[3], Landini MP[4], Kon E[2], Marcacci M[2], Facchini A[5].

Author information

Abstract

BACKGROUND AIMS: Platelet-rich plasma (PRP), a blood derivative rich in platelets, is a relatively new technique used in tissue regeneration and engineering. The increased quantity of platelets makes this formulation of considerable value for their role in tissue healing and microbicidal activity. This activity was investigated against five of the most important strains involved in nosocomial infections (Escherichia coli, Staphylococcus aureus, Pseudomonas aeruginosa, Klebsiella pneumoniae and Streptococcus faecalis) to understand the prophylactic role of pure (P)-PRP. Microbicidal proteins released from activated P-PRP platelets were also determined.

METHODS: The microbicidal activity of P-PRP and platelet-poor plasma (PPP) was evaluated on different concentrations of the five bacterial strains incubated for 1, 2, 4 and 18 h and plated on agar for 18-24 h. P-PRP and PPP-released microbicidal proteins were evaluated by means of multiplex bead-based immunoassays.

RESULTS: P-PRP and PPP inhibited bacterial growth for up to 2 h of incubation. The effect of P-PRP was significantly higher than that of PPP, mainly at the low seeding concentrations and/or shorter incubation times, depending on the bacterial strain. Chemokine (C-C motif) ligand-3, chemokine (C-C motif) ligand-5 and chemokine (C-X-C motif) ligand-1 were the molecules mostly related to Pseudomonas aeruginosa, Staphylococcus aureus and Streptococcus faecalis inhibition. Escherichia coli and Klebsiella pneumoniae were less influenced.

CONCLUSIONS: The present results show that P-PRP might supply an early protection against bacterial contaminations during surgical interventions because the inhibitory activity is already evident from the first hour of treatment, which suggests that physiological molecules supplied in loco might be important in the time frame needed for the activation of the innate immune response.

KEYWORDS: bacterial growth; kinocidins; microbicidal activity; microbicidal proteins; nosocomial infections; platelet-rich plasma

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Review The use of platelet-rich plasma in bone reconstruction therapy. [Biomaterials. 2009]

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Review The use of platelet indices, plateletcrit, mean platelet volu [Biochem Med (Zagreb). 2016]

- Mariani *ve.ark Escherichia coli*, *Staphylococcus aureus*, *Pseudomonas aeroginosa*, *Klebsiella pneumonia* ve *Streptococcus faecalis*
- Saf TZP, saf TFP; 10^4 CFU/ml, 10^5 CFU/ml, 10^6 CFU/ml 1., 2., 4. ve 18.
- TZP > TFP tüm gruplarda etkin, ilk 1-2.saat , bakteri yoğunluğu arttıkça etki az

Tartışma

Bielecki ve ark. lökositli TZP

E. coli, S. aureus oldukça uzun süre inhibitör etki

K. pneumoniae ve *P. aeruginosa* hiçbir etkisi yok

Anitua ve ark. lökositli TZP etkin

Lökosit miktarında ilave artış

Antimikrobiyal etkinliği artırmadığı

Bielecki TM. Antibacterial effect of autologous platelet gel enriched with growth factors and other active substances: an in vitro study. J Bone Joint Surg Br. 2007;89(3):417-20.

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BMC Microbiol. 2013 Feb 25;13:47. doi: 10.1186/1471-2180-13-47.

Antimicrobial activity of pure platelet-rich plasma against microorganisms isolated from oral cavity.

Drago L[1], Bortolin M, Vassena C, Taschieri S, Del Fabbro M.

Author information

Abstract

BACKGROUND: Autologous platelet concentrates (PCs) have been extensively used in a variety of medical fields to promote soft and hard tissue regeneration. The significance behind their use lies in the abundance of growth factors in platelets α-granules that promotes wound healing. In addition, antibacterial properties of PCs against various bacteria have been recently pointed out. In this study, the antimicrobial effect of pure platelet-rich plasma (P-PRP) was evaluated against oral cavity microorganisms such as Enterococcus faecalis, Candida albicans, Streptococcus agalactiae, Streptococcus oralis and Pseudomonas aeruginosa. Blood samples were obtained from 17 patients who underwent oral surgery procedures involving the use of P-PRP. The antibacterial activity of P-PRP, evaluated as the minimum inhibitory concentration (MIC), was determined through the microdilution twofold serial method.

RESULTS: P-PRP inhibited the growth of Enterococcus faecalis, Candida albicans, Streptococcus agalactiae and Streptococcus oralis, but not of Pseudomonas aeruginosa strains.

CONCLUSIONS: P-PRP is a potentially useful substance in the fight against postoperative infections. This might represent a valuable property in adjunct to the enhancement of tissue regeneration.

PMID: 23442413 PMCID: PMC3599521 DOI: 10.1186/1471-2180-13-47

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Drago ve ark. 5 farklı m.o üzerine TZP etkin

Trombositlerin başlattığı etkiyi lökositlerin artırmış olabileceği

Lökosit miktarındaki artışın doğrudan antimikrobiyal potansiyeli güçlendirdiği

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- TZP, TFP, plazma ve TZF; TZP en etkili, 24 saat etkin

Int J Low Extrem Wounds. 2016 Mar;15(1):74-7. doi: 10.1177/1534734615595736. Epub 2015 Aug 2.

Combating Superbug Without Antibiotic on a Postamputation Wound in a Patient with Diabetic Foot.

Sun S[1], Wang C[1], Chen D[1], Cen S[1], Lv X[1], Wen X[1], Liu M[1], Lu W[1], Zhao J[1], Ran X[2].

Author information

Abstract

Diabetic foot is a kind of limb- and life-threatening complication that is difficult to treat with conventional therapy, especially when accompanied with peripheral arterial insufficiency and severe infection. We present a diabetic patient with a postamputation wound infected by multidrug-resistant Acinetobacter baumannii/haemolyticus, which was resistant to almost all antibiotics. As the clinical response to antimicrobial therapy was poor, antibiotic was discontinued. Autologous platelet-rich gel with anticoagulation, negative pressure wound therapy, and improvement of microcirculation were used successfully to eradicate infection of the superbug and achieve final wound closure.

KEYWORDS: autologous platelet-rich gel; diabetic foot; multidrug-resistant bacterial infection; negative pressure wound therapy