

4.5 E. coli'nin teşhisi

4.5.1 Kültürel ve mikroskopik özellikler

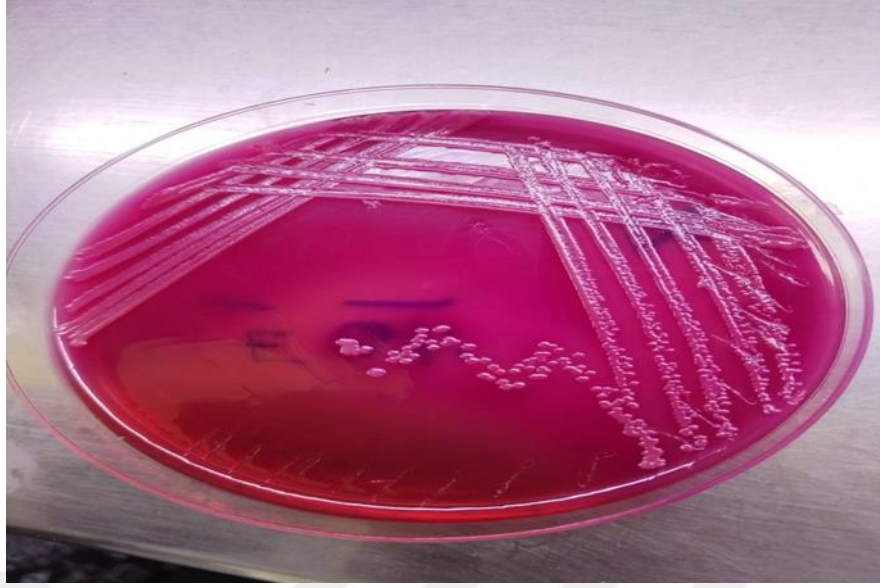
Diyabetik ayak ülseri sürüntüleri kanlı agar besiyerine ekilip 37 C'de 24 saat inkübe edildikten sonra Maconkey besiyerinde büyütüldüğünde parlak gri (parlak) koloniler şeklinde 11 izolat elde edildi. Koloniler düz pembeydi ve sarı tuzların birikmesi nedeniyle koyu pembe bir alanla çevriliydi, mikroskopik gram negatif çubuklar şeklindeydi. Bu kültürel ve mikroskopik özellikler bakteri izolatlarının E. coli olduğunu göstermektedir. (Markey *et al.* 2013; Tille, 2014)

4.5.2 Biyokimyasal testler

E.coli bakterisinde bulunan biyokimyasal testlerin sonuçları, potasyum hidroksit testinde + sonuç verdiği için aerobik fakültatif, katalaz testi için pozitif, oksidaz testi için negatif olduğunu gösterdi.

Çizelge 4.4 E. coli için morfolojik ve biyokimyasal testler

N	Test	Sonuç
1	gram boyama	-
2	hücrel görünüm	çubuk şeklindeki hücreler
3	büyüme koşulları	fakültatif aerobik
4	katalaz testi	+
5	oksidaz testi	-
6	laktoz fermentasyonu	+
7	KOH	+



Şekil 4.12 Macconkey agarda *E.coli*

4.6 Vitek-2 ile Teşhis (GP, GN)

Diyabetik ayak ülserlerinden izole edilen bakteri izolatlarının teşhisi amacıyla, Phytech cihazı kullanılarak bir dizi biyokimyasal test yapılarak, cihaz sonuçları bakteri türlerine göre farklı sonuçların varlığını gösterdiği için doğrulayıcı tanı konuldu. Sonuçlar, %43.60 oranında, *e. coli* 11 izolatları %28,20, *pseudomonas* 6 izolatları %15,38 ve *proteus* 5 izolatları %12,82 oranında bu cihaz ile doğrulanmış ve teşhis edilmiştir.

4.7 Diyabetik Ayak Ülserlerine Neden Olan İzolatların Antibiyotiklere Duyarlılık Testi

Ayak ülseri kontaminasyonuna neden olan tüm bakteri izolatlarının duyarlılığı, Ceftriaxone, Ceftazidime, Imipenem ve Azitromisin dahil olmak üzere antibiyotik tabletleri kullanılarak, çeşitli antibiyotiklere karşı test edildi. *S. aureus* bakterisinin (Ceftriaxone, Ceftazidime, Azitromisin) antibiyotiklerine dirençli, (Ceftazidime, Ceftriaxone) antibiyotiklerine orta derecede dirençli, ve (Imipenem, Azitromisin) antibiyotiklerine duyarlı olduğu, *E.coli* bakterileri (Ceftriaxone, Azitromisin) antibiyotiklerine dirençli ve (Ceftriaxone, Ceftazidime) antibiyotiklere orta derece dirençli ve (Ceftazidime, Imipenem, Azitromisin) antibiyotiklerine duyarlı olduğu,

ancak pseudomonas bakterilerinin (Ceftriaxone, Ceftazidime ve Azitromisin) antibiyotiklerine dirençli ve (Ceftriaxone, Ceftazidime, Imipenem) antibiyotiklerine orta derecede dirençli ve (Ceftriaxone, Ceftazidime, Imipenem) antibiyotiklerine duyarlı olduğu, proteus bakterilerinin ise (Ceftriaxone, Ceftazidime) antibiyotiklerine karşı dirençli ve (Azitromisin, Imipenem, Ceftazidime) antibiyotiklerine karşı duyarlı olduğu bulunmuştur.

Çizelge 4.5 Staphylococcus aureus için antibiyotik yüzdelerini göstermektedir

Antibiyotik	S	I	R
CRO	-	%33.33	%66.67
IMP	%83.33	%16.67	-
CAZ	%66.66	%16.67	%16.67
AZM	%83.33	-	%16.67

Çizelge 4.6 E.coli bakterileri için antibiyotik yüzdelerini göstermektedir

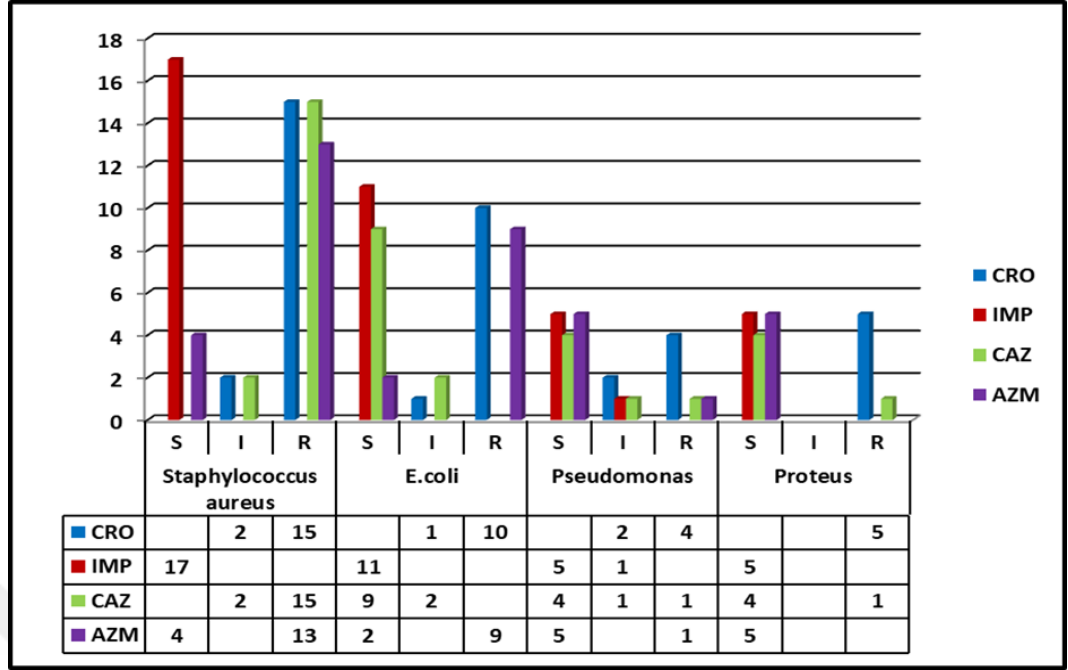
Antibiyotik	S	I	R
CRO	-	%9.10	%90.90
IMP	%100	-	-
CAZ	%81	%18.18	-
AZM	%18.18	-	%81.81

Çizelge 4.7 Pseudomonas bakterileri için antibiyotik yüzdelerini göstermektedir

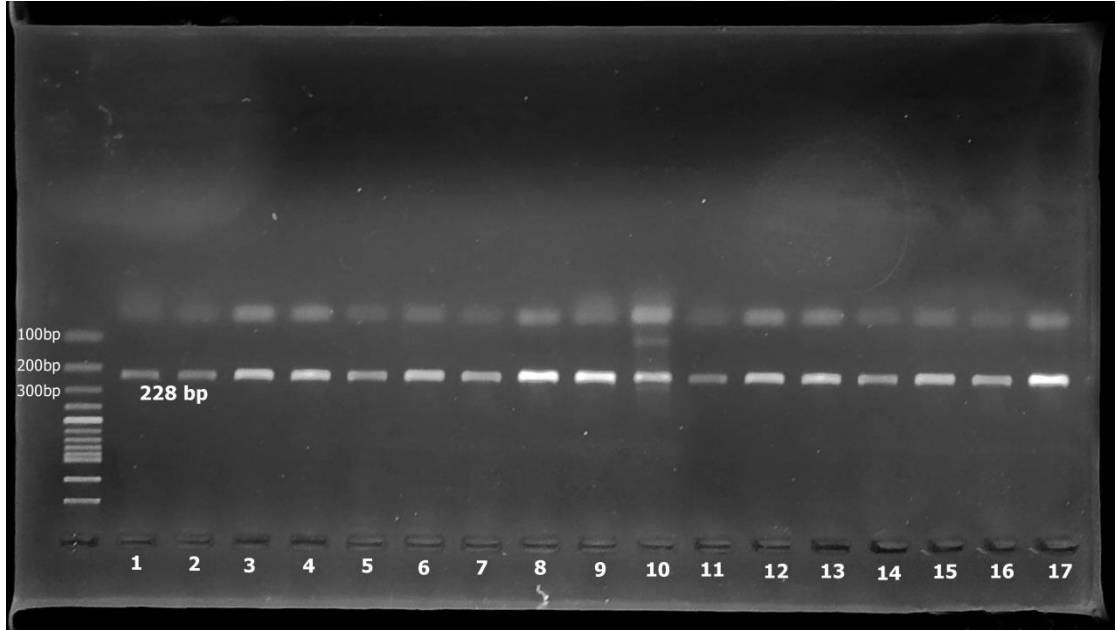
Antibiyotik	S	I	R
CRO		%33.33	%66.67
IMP	%83.33	%16.67	
CAZ	%66.66	%16.67	%16.67
AZM	%83.33	-	%16.67

Çizelge 4.8 Proteus bakterileri için antibiyotik yüzdelerini göstermektedir

Antibiyotik	S	I	R
CRO		-	--
IMP	%100	-	--
CAZ	%80	-	%20
AZM	%100	-	-



Şekil 4.13 Antibiyotiklerin diyabetik ayak ülserlerine neden olan bakteri türlerine duyarlılığını göstermektedir



Şekil 4.14 Staphylococcus aureus izolatlarının PCR reaksiyon ürününün 16 srRNA geni için bir primer kullanılarak %1 agaroz jel ve 100 volt voltaj farkı ile 75 dakikada elektroforezi

5. SONUÇ VE ÖNERİLER

5.2 Sonuçlar

1- Diyabetik ayak ülseri örneklerinde Gram pozitif bakteri Staphylococcus aureus prevalansı

2- Bakteri izolatları bazı antibiyotiklere direnç, bazı antibiyotiklere orta derecede, bazılarına ise duyarlılık göstermiştir.

3- Staphylococcus aureus'un biyofilm oluşturma yeteneği, kullanılan besiyerinin türüne bağlıdır.

4- Staphylococcus aureus izolatlarının bakteri türü ve suşa bağlı olarak farklı çap ve şekillerde canlı ve cansız yüzeylere tutunabilme ve difüzyonla hareket edebilme yeteneği

5- Staphylococcus aureus izolatları 16srRNA genine sahiptir.

6- Hastalardan alınan histolojik kesitler sayesinde nekroz, vakuol varlığı ve fibrin lifi birikintilerinin yanı sıra inflamatuvar rezorpsiyon gibi doku içerikleri ve üzerlerinde oluşan değişiklikler tespit edilmiştir.

5.2 Recommendations

1-Adopting biochemical tests to detect staphylococcal bacteria that are common in diabetic foot ulcers

2-Conducting extensive studies on the adhesion ability of Staphylococcus aureus by using more isolates from different sources and using different surface types.

3-Conducting many researches and studies on the resistance of Staphylococcus aureus bacteria that make up the biofilm to antibiotics.

4-Conducting research on the relationship of some genes such as (16srRNA) with other genes encoding adhesion proteins and biofilm formation.

5- Conducting histological studies of gangrene of the diabetic foot.



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