

UDAİS 2022

VII. ULUSAL DİYABETİK AYAK
İNFEKSİYONLARI SİMPOZYUMU

12-15 EKİM 2022

Mirage Park Resort Hotel Kemer-Antalya

 **DAİÇG** KLİMİK DERNEĞİ DİYABETİK
AYAK İNFEKSİYONLARI ÇALIŞMA GRUBU



Diyabetik Ayakta Son Yıllarda Etyoloji Değişiyor mu?

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Diyabetik Ayak Ülseri

- **422 milyon** Diyabet (yetişkin popülasyonun %8,5)
- 9,1 -26,1 milyon DAÜ / yıl / dünya
 - uluslararası diyabet federasyonu 2015
 - *Armstrong DG, Boulton AJM, Bus SA. Diabetic foot ulcers and their recurrence. N Engl J Med. 2017;376(24):2367-2375.*
 - DAÜ prevalansı %4-10, yaşam boyu insidans %25
 - *Singh N, Armstrong DG, Lipsky BA. Preventing foot ulcers in patients with diabetes. JAMA. 2005;293(2):217-228.*
 - Diyabet hastalarında **tedavi maliyeti** DAÜ olanlarda **1,5-2,5 kat** yüksek
 - **Periferik arter hastalığı** varlığında maliyet **4 kat** yüksek
 - *Diabetes Metab Res Rev. 2019;35:e3160.*

Dişabetik Ayak Enfeksiyonu

- **İnfekte DAÜ (DAE) prognozu** kötüleşirir

- DAÜ / DAE - Prospektif bir çalışma

- iyileşme oranı %46 / 1 yıl
- iyileşenlerin %10'unda rekürrens
- %15 mortalite
- %17 alt ekstremitte amputasyonu

- *Ndosi M, et al. Prognosis of the infected diabetic foot ulcer: a 12-month prospective observational study. Diabet Med. 2018*

- DAE **hastaneye yatışı gerektiren** en sık Dişabetik komplikasyon

- Alt ekstremitte **amputasyonun** 1. nedeni

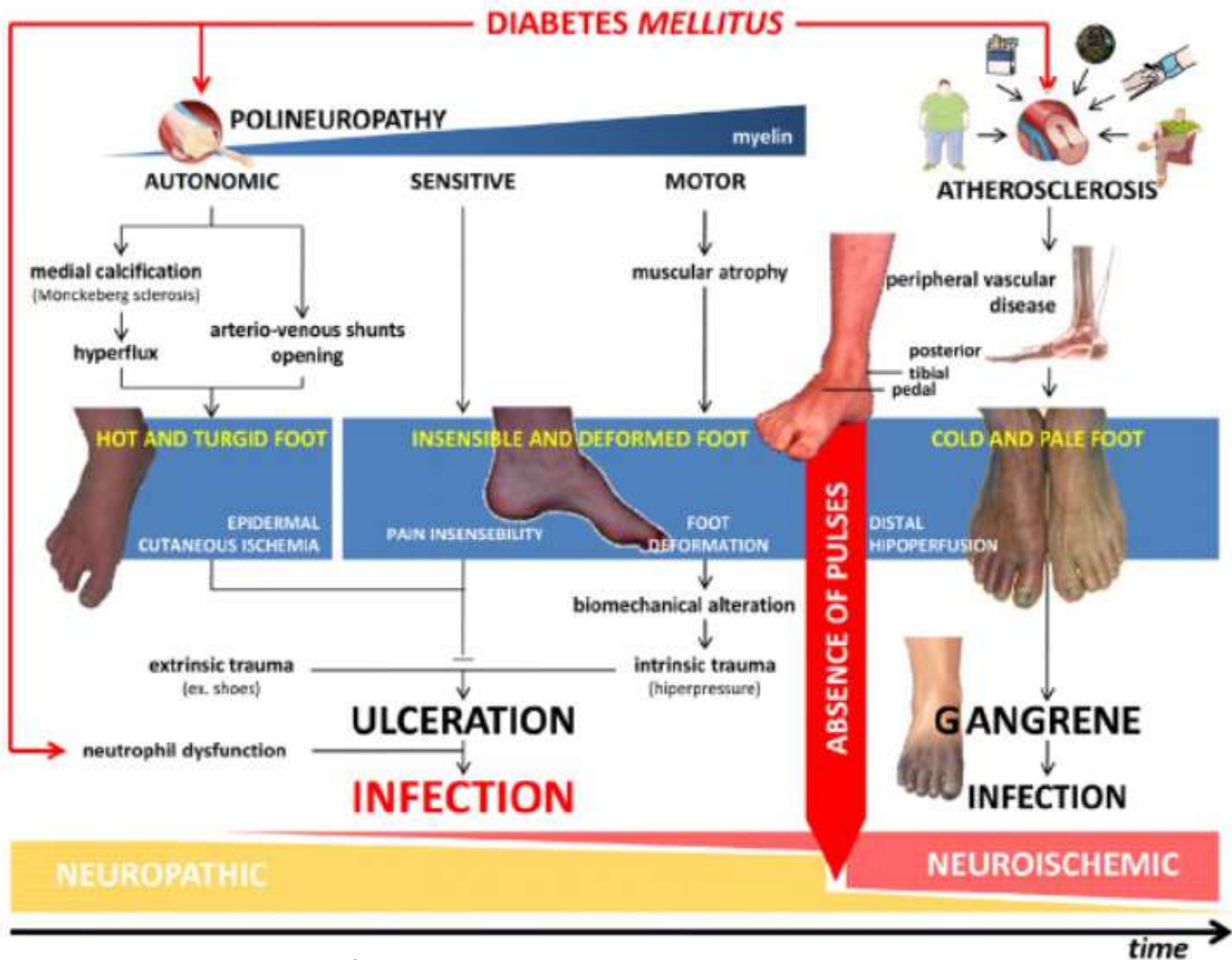
- *Tan TW, et al. Disparities in outcomes of patients admitted with diabetic foot infections. PLoS One. 2019*

Diyabetik ayak enfeksiyonu

- **Enfeksiyon:** Konak dokuda inflamatuvar yanıt ve/veya doku harabiyetinin eşlik ettiği m.o. invazyonu ve çoğalması
- **Enfekte DAU**
 - **Aşağıdakilerden en az 2'sinin varlığı**
 - Lokal ödem veya endürasyon
 - Eritem >0.5 cm (yara çevresinde)
 - Lokal hassasiyet veya ağrı
 - Lokal ısı artışı
 - Pürülan akıntı
 - **Ve deride inflamatuvar yanıtı neden olabilecek diğer nedenlerin yokluğu** (Ör, travma, gut, akut Charcot nöro-osteoadrtropati, kırık, trombüs, veya venöz staz)
- **Yüzeysel** : Deri (dermis) ile sınırlı
- **Derin** : Dermisin altına uzanan enfeksiyon.
 - Apse, septik artrit, osteomyelit, septik tenosynovit, nekrotizan fasiit

Wagner classification of diabetic foot ulcers

| Grade 0 | Grade 1 | Grade 2 |
|--|---|---|
| <p data-bbox="164 235 569 271">No ulcer in a high-risk foot</p>  | <p data-bbox="695 235 1271 314">Superficial ulcer involving the full skin thickness but not underlying tissues</p>  | <p data-bbox="1342 235 1870 357">Deep ulcer, penetrating down to ligaments and muscle, but no bone involvement or abscess formation</p>  |
| Grade 3 | Grade 4 | Grade 5 |
| <p data-bbox="92 756 633 835">Deep ulcer with cellulitis or abscess formation, often with osteomyelitis</p>  | <p data-bbox="840 756 1130 792">Localized gangrene</p>  | <p data-bbox="1352 756 1850 835">Extensive gangrene involving the whole foot</p>  <p data-bbox="1671 1242 1845 1285">MD:A.N.</p> |



Mendes. Diabetic Foot Infections: Current Diagnosis and Treatment. 2012

DAE Etiyoloji neden önemli ?

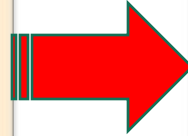
- DFE'lerinin **kanıta dayalı** ve **disiplinler arası işbirliği** ile yönetimi
 - Tedavi yanıtını artırır
 - Komplikasyonları azaltır (ampütasyon vb)
 - Maliyeti azaltır
 - Akılcı antibiyotik kullanımının getireceği diğer faydalar

DAE Etiyoloji

- DAU tipik olarak başlangıçta **GPB** kolonize olur
 - Akut dönem
 - *S. aureus* (MSSA, MRSA),
 - BHS (GAS, GBS veya GCS, GGS)
 - Kronik ülser
 - Ölü, nekrotik doku
 - GNB (*P. aeruginosa*, *Enterobacteriaceae* (*E. coli*, *Proteus spp.*, *Klebsiella spp.*) ve
 - Anaerobik bakteriler (*Bacteroides spp.*, *Clostridium spp.*)
 - *Lipsky, Guidelines on the diagnosis and treatment of foot infection in persons with diabetes (IWGDF 2019 update). 2019*

DAE Etiyoloji

- Hastaneye yatış
- Geniş spektrumlu antibiyotik kullanımı
- Yara kapama, tıbbi müdahaleler



Florada deęişim

MRSA

VRE

GNB: ESBL+

Pseudomonas spp...

DAE Etiyoloji

- **Sıcak iklim** ülkelerinde (Hindistan, Orta doğu, Afrika,..)
 - ***P. aeruginosa*** en sık patojen
 - Hijyenik ve
 - kültürel faktörler
 - *Spichler A. Microbiology of diabetic foot infections: from Louis Pasteur to 'crime scene investigation.'* BMC Med 2015

Etiyolojik Çalışmalar

- Pakistan: 1991-2008 (1999 öncesi ve sonrası)

| Variable | Isolates per culture | | | | Overall isolates | |
|--|----------------------|-------------|-------------|--------------|------------------|------------|
| | 1st culture | 2nd culture | 3rd culture | All cultures | Up to 1999 | After 1999 |
| Cultures (n) | 691 | 580 | 361 | 1632 | 689 | 943 |
| Gram-negative | 415 (25.3) | 332 (20.3) | 186 (11) | 932 (57.1) | 349 (50.6) | 603 (64) |
| <i>P. aeruginosa</i> | 135 (20.1) | 89 (15.3) | 53 (15.3) | 1 277 (16.9) | 123 | 147 |
| <i>E. coli</i> | 116 (16.3) | 97 (16.7) | 50 (14.2) | 2 263 (16.1) | 70 | 153 |
| <i>Proteus</i> spp. | 63 (3.8) | 54 (3.3) | 27 (1.7) | 143 (8.8) | 62 | 61 |
| <i>Klebsiella</i> spp. | 48 (2.9) | 40 (2.5) | 21 (1.3) | 109 (6.7) | 20 | 89 |
| <i>Citrobacter</i> spp. | 21 (1.3) | 21 (1.3) | 10 (0.6) | 52 (3.2) | 10 | 42 |
| <i>Acinetobacter</i> spp. | 19 (1.2) | 23 (1.4) | 18 (1.1) | 60 (3.7) | 12 | 48 |
| <i>Enterobacter</i> spp. | 13 (0.8) | 8 (0.5) | 7 (0.4) | 28 (1.7) | 52 | 63 |
| Gram-positive | 247 (15.1) | 182 (11.2) | 82 (5.0) | 511 (31.3) | 280 (40.6) | 286 (30.3) |
| <i>S. aureus</i> | 116 (17.2) | 79 (13.6) | 30 (1.8) | 3 225 (13.8) | 101 | 144 |
| <i>Enterococcus</i> spp. | 77 (4.7) | 52 (3.2) | 26 (1.6) | 155 (9.5) | 92 | 83 |
| Coagulase-negative <i>Staphylococcus</i> | 30 (1.8) | 33 (2.0) | 19 (1.2) | 82 (5.0) | 45 | 37 |
| <i>Streptococcus</i> spp. | 24 (1.5) | 18 (1.1) | 7 (0.4) | 49 (3.0) | 27 | 22 |
| Anaerobes | 7 (0.4) | 3 (0.2) | 2 (0.1) | 12 (0.7) | 5 | 7 |
| Sterile | 22 (1.3) | 63 (3.9) | 91 (5.6) | 177 (10.8) | 55 | 47 |

DAE Etiyoloji

- **Hindistan; 2013-2014**
 - Polimikrabiyal %56,7
 - **Gram negatif %76 (%35 MDR)**
 - *E. coli* %15,7
 - *Pseudomonas* spp. %13.5
 - *K. pneumoniae* %13,5
 - **Gram pozitif %24**
 - *S. aureus* %20,7
 - MRSA %26,7

Miyan. Microbiological pattern of diabetic foot infections at a tertiary care center in a developing country. J Pak Med Assoc.2017

DAE Etiyoloji

- Kuzey Amerika ve Avrupa

- GBP- *S. aureus* predominant

- *Lipsky BA. IWGDF guideline on the diagnosis and treatment of foot infection in persons with diabetes. Diabet Metab Res Rev.*

- **MRSA** sıklığında artış

- USA'da en sık **multidrug rezistan patojen** (1/3)

- *Henig O, et al. Epidemiology of diabetic foot infection in the metro-Detroit area with a focus on independent predictors for pathogens resistant to recommended empiric antimicrobial therapy. Open Forum Infect Dis 2018;5:*

- Hawkins; Diabetic foot infections: A microbiologic review. Foot (edinb) 2022

- Global literatür taraması

- *S. aureus* en sık, *P. aeruginosa* ve **MDR GNB** insidansında artış

Etiyolojik Çalışmalar

• Çin; Çok Merkezli Çalışma (2010-2014)

• GNB %57,5

• *Enterobacteriaceae* %41

• *Proteus* %9,8

• *E. coli* %9,3

• *P. aeruginosa* %13,1

• GPB %39,6

• Staphylococcus spp %25,4

• *S. aureus* %17,1

• MRSA 24,5

• KNS %8,3

Li X, et al. Microbiological profile and clinical characteristics of diabetic foot infection in northern China: a retrospective multicentre survey in the Beijing area. J Med Microbiol 2018;

-Multivarite analiz

- >60 yaş GNB ile ilişkili

• İleri yaş,

• Geleneksel tedavi kullanımı

• Ayaktan hastaların >%50 antibiyotik kullanımı

• Kendi inisiyatifi ile antb kullanımı ve geleneksel ilaçlar hastaneye yatışı geciktirmekte –GNB insidansı artırmış olabilir

Etiyolojik Çalışmalar

• Brazilya 2022

- **GPB** 188 (68.1%)
- **GNB** 88 (31.9%).

Table 1. Isolated pathogens in patients admitted with DFI (n = 276).

| Gram-Positive | n | % | Gram-Negative | n | % |
|--------------------------|----|------|-------------------------------------|----|-----|
| <i>E. faecalis</i> | 68 | 24.6 | <i>Pseudomonas aeruginosa</i> | 21 | 7.6 |
| <i>S. aureus</i> | 47 | 17.0 | <i>Proteus</i> sp. | 13 | 4.7 |
| Other Coagulase-negative | 40 | 14.4 | Other Enterobacterales | 13 | 4.7 |
| Staphylococci | 21 | 7.6 | <i>Klebsiella pneumoniae</i> | 12 | 4.3 |
| <i>S. epidermidis</i> | 5 | 1.8 | <i>E. coli</i> | 9 | 3.2 |
| <i>E. faecium</i> | 4 | 1.4 | <i>Enterobacter</i> sp. | 8 | 2.8 |
| <i>Enterococcus</i> sp. | 3 | 1.0 | <i>Acinetobacter</i> sp. | 6 | 2.1 |
| <i>S. agalactiae</i> | | | <i>Stenotrophomonas maltophilia</i> | 5 | 1.8 |
| | | | <i>Burkholderia cepacia</i> | 1 | 0.3 |

- *Palomo. Microbiology of Diabetic Foot Infections in a Tertiary Care Hospital in São Paulo, Brazil. Antibiotic, 2022*

• Brazilya 2020

- **GNB %60**
 - *Enterobacteriaceae* (51,5%)
- **GPB %40**
 - *Staphylococcus aureus* (20%) ve *Enterococcus faecalis* (17,9%).

- *Ponts. Microbiologic characteristics and antibiotic resistance rates of diabetic foot infections. Rev Col Bras Cir. 2020*

Guidelines on the diagnosis and treatment of foot infection in persons with diabetes (IWGDF 2019 update)

Benjamin A. Lipsky^{1,2} | Éric Senneville³ | Zulfiqarali G. Abbas⁴ |
 Javier Aragón-Sánchez⁵ | Mathew Diggle⁶ | John M. Embil⁷ | Shigeo Kono⁸ |
 Lawrence A. Lavery⁹ | Matthew Malone¹⁰ | Suzanne A. van Asten¹¹ |
 Vilma Urbančič-Rovan¹² | Edgar J.G. Peters¹³ on behalf of the International Working
 Group on the Diabetic Foot (IWGDF)

TABLE 4 Factors to consider in selecting an empiric antibiotic regimen for diabetic foot infections^a

| Infection severity | Additional factors | Usual pathogen(s) ^c | Potential empirical regimens ^d |
|---------------------------------|-------------------------------------|-----------------------------------|---|
| Mild | No complicating features | GPC | S-S pen; first gen ceph |
| | β-lactam allergy or intolerance | GPC | Clindamycin; FQ; T/S; macrolide; doxy |
| | Recent antibiotic exposure | GPC + GNR | β-L-ase-1; T/S; FQ |
| | High risk for MRSA | MRSA | Linezolid; T/S; doxy; macrolide |
| Moderate or severe ^e | No complicating features | GPC ± GNR | β-L-ase 1; second/third gen ceph |
| | Recent antibiotics | GPC ± GNR | β-L-ase 2; 3rd gen ceph; group 1 carbapenem (depends on prior therapy; seek advice) |
| | Macerated ulcer or warm climate | GNR, including <i>Pseudomonas</i> | β-L-ase 2; S-S pen + ceftazidime; S-S pen + cipro; group 2 carbapenem |
| | Ischaemic limb/necrosis/gas forming | GPC ± GNR ± Anaerobes | β-L-ase 1 or 2; group 1 or 2 carbapenem; 2nd/3rd gen ceph + clindamycin or metronidazole |
| | MRSA risk factors | MRSA | Consider adding, or substituting with, glycopeptides; linezolid; daptomycin; fusidic acid T/S (±rif) ^b ; doxycycline |
| | Risk factors for resistant GNR | ESBL | Carbapenems; FQ; aminoglycoside and colistin |

Abbreviations: β-L-ase, β-lactam, β-lactamase inhibitor; β-L-ase 1, amoxicillin/clavulanate, ampicillin/sulbactam; β-L-ase 2, ticarcillin/clavulanate, piperacillin/tazobactam; doxy, doxycycline; ESBL, extended-spectrum β-lactamase-producing organism; FQ, fluoroquinolone with good activity against

Comparison of Bacterial Isolates Cultured from Hemodialysis Patients and Other Patients with Diabetic Foot and Their Antimicrobial Resistance

Meryem Cetin

Mustafa Kemal University, Department of Microbiology and Clinical Microbiology, Hatay, Turkey

Renal Failure, 29:973–978, 2007

- 2004-2005
- 97 hasta; 32 Diyaliz hastası)
 - KNS (%20,3)
 - S. aureus (%19,8),
 - *Escherichia coli* (9.9%), ve *Enterococcus spp* (8.7%)
- HD hastaları (32);
 - *S. aureus* (22.9%),
 - KNS (19.7%) ve
 - *Enterococcus spp.* (9.8%),
- Diğer Hastalar (65);
 - KNS (20.7%),
 - *S. aureus* (18.0%) ve
 - *Enterococcus spp.* (8.1%).

Table 2

A comparison of incidence of isolated pathogens in 32 hemodialysis and 65 other patients with diabetic foot infection

| Evaluated pathogens | Dialysis patients (%) | Other patients (%) | All patients (%) | <i>p</i> |
|---------------------------------|-----------------------|--------------------|------------------|----------|
| <i>Staphylococcus aureus</i> | 22.9 | 18.0 | 19.8 | NS |
| CNS | 19.7 | 20.7 | 20.3 | NS |
| <i>Enterococcus species</i> | 9.8 | 8.1 | 8.7 | NS |
| <i>Streptococcus species</i> | 6.5 | 6.3 | 6.4 | NS |
| <i>Escherichia coli</i> | 11.5 | 9.0 | 9.9 | NS |
| <i>Klebsiella pneumoniae</i> | 6.5 | 5.4 | 5.8 | NS |
| <i>Morganella morgani</i> | 4.9 | 6.3 | 5.8 | NS |
| <i>Proteus mirabilis</i> | 4.9 | 5.4 | 5.2 | NS |
| <i>Enterobacter species</i> | 3.1 | 8.1 | 6.4 | NS |
| <i>Pseudomonas species</i> | 6.5 | 8.1 | 7.6 | NS |
| <i>Clostridium subterminale</i> | 1.6 | 0.9 | 1.2 | NS |
| <i>Bacteroides ureolyticum</i> | 1.6 | 1.8 | 1.7 | NS |
| <i>Leuconostoc spp.</i> | 0 | 1.8 | 1.2 | NS |
| Sterile culture | 15.6 | 20.0 | 18.5 | NS |
| Polymicrobial infection | 44.4 | 44.2 | 44.3 | NS |

Abbreviation: CNS = coagulase-negative *Staphylococcus* species.

p value: hemodialysis patients vs. the other patients. NS = not significant.

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Renal Failure, 29:973–978, 2007

- 2004-2005
- 97 hasta; 32 Diyaliz hastası)
 - KNS (%20,3)
 - *S. aureus* (%19,8),
 - *Escherichia coli* (%9,9), ve *Enterococcus spp* (%8,7)
- HD hastaları (32);
 - *S. aureus* (22.9%),
 - KNS (19.7%) ve
 - *Enterococcus spp.* (9.8%),
- Diğer Hastalar (65);
 - KNS (20.7%),
 - *S. aureus* (18.0%) ve
 - *Enterococcus spp.* (8.1%).

Table 3

A comparison of antibiotic resistances for *S. aureus* between the hemodialysis patients and the other patients with the diabetic foot

| Variables | Dialysis patients (%) | Other patients (%) | <i>p</i> value |
|-------------------------------------|-----------------------|--------------------|----------------|
| Number of detected <i>S. aureus</i> | 14 | 20 | |
| Types of antibiotics | | | |
| Amoxicillin-clavulanate | 50 | 25 | NS |
| Oxacillin | 43 | 30 | NS |
| Fusidic acid | 14 | 5 | NS |
| Vancomycin | 0 | 0 | |
| Imipenem | 36 | 40 | NS |
| Piperacillin | 29 | 25 | NS |
| Sefazolin | 43 | 15 | NS |
| Clindamycine | 50 | 30 | NS |
| Erythromycin | 36 | 30 | NS |
| Co-trimoxazole (TM-SXT) | 21 | 30 | NS |
| Gentamycine | 29 | 30 | NS |
| Ciprofloxacin | 29 | 35 | NS |

NS = Not significant.

CLINICAL STUDY

Comparison of Bacterial Isolates Cultured from Hemodialysis Patients and Other Patients with Diabetic Foot and Their Antimicrobial Resistance

Meryem Cetin

Mustafa Kemal University, Department of Microbiology and Clinical Microbiology, Hatay, Turkey

- Prevalans GNB HD + / -
 - 37.7% ve 42.3%, ($p > 0.05$).
- GNB arasında
 - *E. coli* (11.5% ve 9.0%),
 - *P. aeruginosa* (6.5% ve 8.1%).

The major clinical outcomes of diabetic foot infections: One center experience

Cent. Eur. J. Med. • 3(4) • 2008 • 464-469

Research Article

Adem Ozkara¹, Tuncay Delibası², Yusuf S

- 2007 submit, 2008 yayın
- 4 yıllık retropektif (2003-2007 ?)
- 84 olgu
- GPB %55, GNB %49
 - *Staphylococcus aureus* (39%),
 - *Pseudomonas aeruginosa* (14%),
 - *Proteus mirabilis* (14%),
 - *Escherichia coli* (14%),
 - *Group B streptococci* (12%),
 - *Klebsiella pneumonia* (8%).

Table 2. Bacteria isolated from diabetic foot infections of 51 patients.

| Micro-organisms | N | (%) |
|---|----|-----|
| Total | 51 | 100 |
| Monomicrobial etiology | 30 | 48 |
| Polymicrobial etiology | 21 | 34 |
| Sterile culture | 11 | 17 |
| Aerobes | 39 | 76 |
| Aerobes ve anaerobes | 12 | 24 |
| Anaerobes | 0 | 0 |
| Gram-positive aerobes | 28 | 55 |
| <i>Staphylococcus aureus</i> | 20 | 39 |
| Methicillin-sensit. <i>Staphyl.aureus</i> | 12 | 23 |
| Methicillin-resist. <i>Staphyl.aureus</i> | 8 | 16 |
| Group B streptococci | 6 | 12 |
| Gram-negative aerobes | 25 | 49 |
| <i>Pseudomonas aeruginosa</i> | 7 | 14 |
| <i>Klebsiella pneumonia</i> | 4 | 8 |
| <i>Proteus mirabilis</i> | 7 | 14 |
| Other gram negatives | 7 | 14 |
| Gram-positive bacilli | | |
| Difteroid bacillus | 2 | 4 |
| Anaerobes | 4 | 8 |
| <i>Candida species</i> | 3 | 6 |

Diyabetik Ayak İnfeksiyonu Etkenlerinin Yıllara Göre Dağılımı: Değişim Var mı?

M. Bülent Ertuğrul, et al. Klimik Dergisi 2017; 30(1): 27-31.

*The Distribution of Causative Microorganisms in Diabetic Foot Infection:
Has There Been Any Alterations?*

- **1 Ocak 2000 ile 31 Aralık 2014** tarihleri arasında Türkiye kaynaklı ulusal ya da uluslararası dergilerde yayımlanmış veya ulusal ya da uluslararası kongrelerde sunulmuş DAİ etkenlerini araştıran **28 araştırmanın** sonuçlarını kapsamaktadır
 - **2000-2004** yılları arasında 4,
 - **2005-2009** yılları arasında 9 ve
 - **2010-2014** yılları arasında 15 olmak üzere
 - **toplam 28 makale**, kongre bildirisi ve tez çalışmaya alınmaya uygun bulundu

Diyabetik Ayak Enfeksiyonu Etkenlerinin Yıllara G6re Dağılımı: Deęişim Var mı?

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Tablo 1. Diyabetik Ayak Enfeksiyonu Etkenlerinin Yıllara G6re Dağılımı (6-33)

| Yıllar | 2000-2004 | 2005-2009 | 2010-2014 | | 2000-2014 |
|----------------------------|------------|------------|------------|----------|------------|
| Etkenler | Sayı (%) | Sayı (%) | Sayı (%) | <i>p</i> | Sayı (%) |
| Gram-pozitifler | 139 (40.5) | 227 (50.4) | 476 (45.5) | 0.020 | 842 (45.8) |
| <i>S. aureus</i> | 101 (29.4) | 130 (28.9) | 189 (18.1) | <0.001 | 420 (22.8) |
| KNS | 6 (1.7) | 36 (8) | 110 (10.5) | <0.001 | 152 (8.3) |
| <i>Enterococcus spp.</i> | 5 (1.5) | 25 (5.6) | 97 (9.3) | <0.001 | 127 (6.9) |
| <i>Streptococcus spp.</i> | 15 (4.4) | 30 (6.7) | 71 (6.8) | 0.262 | 116 (6.3) |
| Dięer Gram-pozitifler | 12 (3.5) | 6 (1.3) | 9 (0.9) | 0.002 | 27 (1.5) |
| Gram-negatifler | 204 (59.5) | 219 (48.7) | 564 (53.9) | 0.010 | 987 (53.7) |
| <i>Paeruginosa</i> | 67 (19.5) | 75 (16.7) | 164 (15.6) | 0.251 | 306 (16.7) |
| <i>Escherichia coli</i> | 59 (17.2) | 55 (12.2) | 124 (11.8) | 0.033 | 238 (12.9) |
| <i>Proteus spp.</i> | 15 (4.4) | 22 (4.9) | 56 (5.3) | 0.759 | 93 (5.1) |
| <i>Klebsiella spp.</i> | 19 (4.4) | 14 (3.1) | 71 (6.8) | 0.018 | 104 (5.7) |
| <i>Acinetobacter spp.</i> | 10 (2.9) | 23 (5.1) | 21 (2) | 0.005 | 54 (2.9) |
| <i>Enterobacter spp.</i> | 14 (4.1) | 13 (2.9) | 49 (4.7) | 0.278 | 76 (4.1) |
| <i>Citrobacter spp.</i> | 0 | 1 (0.2) | 9 (0.9) | 0.097 | 10 (0.5) |
| <i>Morganella spp.</i> | 0 | 5 (1.1) | 27 (2.6) | 0.003 | 32 (1.7) |
| <i>S. maltophilia</i> | 2 | 2 (0.4) | 2 (0.2) | 0.478 | 6 (0.4) |
| Dięer (anaeroplarda dahil) | 18 (5.2) | 9 (0.7) | 41 (3.9) | 0.047 | 68 (3.7) |
| <i>Candida spp.</i> | 0 (0.0) | 4 (0.9) | 6 (0.6) | 0.237 | 10 (0.5) |
| Toplam Suş Sayısı | 343 | 450 | 1046 | | 1839 |

KNS: Koagülaz-negatif stafillokoklar.

Diyabetik Ayak Enfeksiyonu Etkenlerinin Yıllara Göre Dağılımı: Değişim Var mı?

M. Bülent Ertuğrul, et al. Klimik Dergisi 2017; 30(1): 27-31.

*The Distribution of Causative Microorganisms in Diabetic Foot Infection:
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Tablo 1. Diyabetik Ayak Enfeksiyonu Etkenlerinin Yıllara Göre Dağılımı (6-33)

| Yıllar | 2000-2004 | 2005-2009 | 2010-2014 | | 2000-2014 |
|---------------------------|------------|------------|------------|--------|------------|
| Etkenler | Sayı (%) | Sayı (%) | Sayı (%) | p | Sayı (%) |
| Gram-pozitifler | 139 (40.5) | 227 (50.4) | 476 (45.5) | 0.020 | 842 (45.8) |
| <i>S. aureus</i> | 101 (29.4) | 130 (28.9) | 189 (18.1) | <0.001 | 420 (22.8) |
| KNS | 6 (1.7) | 36 (8) | 110 (10.5) | <0.001 | 152 (8.3) |
| <i>Enterococcus spp.</i> | 5 (1.5) | 25 (5.6) | 97 (9.3) | <0.001 | 127 (6.9) |
| <i>Streptococcus spp.</i> | 15 (4.4) | 30 (6.7) | 71 (6.8) | 0.262 | 116 (6.3) |
| Diğer Gram-pozitifler | 12 (3.5) | 6 (1.3) | 9 (0.9) | 0.002 | 27 (1.5) |
| Gram-negatifler | 204 (59.5) | 219 (48.7) | 564 (53.9) | 0.010 | 987 (53.7) |

Gram-pozitifler %45.8 (n=842)

Gram-negatifler %53.7 (n=987)

En sık saptanan ilk üç mikroorganizma sırasıyla

Staphylococcus aureus (%22.8),

Pseudomonas aeruginosa (%16.7) ve

Escherichia coli (%12.9) .

Toplam Suş Sayısı 343 450 1046 1839

KNS: Koagülaz-negatif stafilokoklar.

Diyabetik Ayak Enfeksiyonu Etkenlerinin Yıllara G6re Dağılımı: Deęişim Var mı?

M. B6lent Ertuęrul, et al. Klimik Dergisi 2017; 30(1): 27-31.

*The Distribution of Causative Microorganisms in Diabetic Foot Infection:
Has There Been Any Alterations?*

Tablo 2. Stafilokoklarda Metisilin Direncinin Arařtırıldıęı alıřmaların Sonuları

| Yıllar | 2000-2004 | 2005-2009 | 2010-2014 | | 2000-2014 |
|------------------------------|---------------------|---------------------|---------------------|----------|---------------------|
| Gram-Pozitifler | Sayı (%) (n=139) | Sayı (%) (n=134) | Sayı (%) (n=242) | <i>p</i> | Sayı (%) (n=525) |
| <i>Staphylococcus aureus</i> | 101 | 85 | 103 | | 289 |
| MRSA | 43 (12.5) | 46 (16.2) | 28 (5.5) | <0.001 | 117 (10.3) |
| MSSA | 58 (16.9) | 39 (13.7) | 75 (14.7) | 0.506 | 172 (15.1) |
| KNS | 6 | 9 | 45 | | 60 |
| MRKNS | 3 (0.8) | 3 (1.1) | 23 (4.5) | 0.001 | 29 (2.5) |
| MSKNS | 3 (0.8) | 3 (1.1) | 10 (2) | 0.356 | 16 (1.4) |
| Toplam Suř Sayısı* | 343 | 284 | 511 | | 1139 |

MRSA: metisiline direnli *S. aureus*, MSSA: metisiline duyarlı *S. aureus* KNS: koag6laz-negatif stafilokoklar, MRKNS: metisiline direnli koag6laz-negatif stafilokoklar, MSKNS: metisiline duyarlı koag6laz-negatif stafilokoklar,

*Deęerlendirilen 19 alıřmada izole edilen t6m suřlar.

Risk Factors for Infection with *Pseudomonas aeruginosa* in Diabetic Foot Infections

Bulent M. Ertugrul, MD*
Benjamin A. Lipsky, MD†
Mevlut Ture, PhD‡
Serhan Sakarya, MD*

Table 2. Microorganisms Isolated from Foot Wound Culture

| Causative Bacteria | No. (%) |
|-------------------------------------|-----------|
| Gram-positive aerobic cocci | |
| <i>Staphylococcus aureus</i> | 12 %13,5 |
| Methicillin resistant | 4 |
| Coagulase-negative staphylococcus | 10 %11,2 |
| Methicillin resistant | 6 |
| <i>Streptococcus</i> spp | 8 |
| <i>Enterococcus</i> spp | 6 |
| Subtotal | 36 (40.4) |
| Gram-negative aerobic bacilli | |
| <i>Pseudomonas aeruginosa</i> | 23 %25,8 |
| <i>Escherichia coli</i> | 7 |
| <i>Klebsiella pneumoniae</i> | 6 |
| <i>Proteus</i> spp | 5 |
| <i>Morganella morganii</i> | 4 |
| <i>Enterobacter</i> spp | 2 |
| <i>Serratia marcescens</i> | 1 |
| <i>Stenotrophomonas maltophilia</i> | 1 |
| Subtotal | 49 (55.1) |
| Obligate anaerobes | 3 (3.4) |
| <i>Candida parapsilosis</i> | 1 (1.1) |
| Total | 89 (100) |

- Epidermal büyüme faktörü (hEGF) tedavisi alan 90 DAE olgusu
- 1 Ocak 2012 – 31 Aralık 2013
 - Yaş (ort): 61.11
 - %84 Tip2 DM
 - %25 RY, %19 Dializ
 - Öncesinde
 - Hastane yatışı %74
 - DFU %47
 - Osteomyelit %25
 - Ampütasyon %22
 - Vasküler op %17
 - Aktif Yara kapama %13
 - Antibiyotik kullanım %56 (<30 gün)

Risk Factors for Infection with *Pseudomonas aeruginosa* in Diabetic Foot Infections

Bulent M. Ertugrul, MD*
 Benjamin A. Lipsky, MD†
 Mevlut Ture, PhD‡
 Serhan Sakarya, MD*

P. aeruginosa enfeksiyonu açısından RİSK FAKTÖRÜ ?

Table 3. Univariate Analysis Comparing Factors Potentially Associated with the Isolation of *Pseudomonas aeruginosa* from Wound Culture

| Factor | <i>P. aeruginosa</i> on culture (No.) | | P Value |
|---|---------------------------------------|----------|---------|
| | Negative | Positive | |
| Antibiotics received within the previous 30 days | | | |
| No (n = 34) | 31 | 3 | .005 |
| Yes (n = 56) | 36 | 20 | |
| Previous foot ulcer at any site | | | |
| No (n = 43) | 40 | 3 | <.001 |
| Yes (n = 47) | 27 | 20 | |
| Previous foot osteomyelitis at any site | | | |
| No (n = 65) | 57 | 8 | <.001 |
| Yes (n = 25) | 10 | 15 | |
| Previous debridement (soft tissue) | | | |
| No (n = 48) | 41 | 7 | .009 |
| Yes (n = 41) | 25 | 16 | |
| Previous lower-extremity amputation (ipsilateral or contralateral) | | | |
| No (n = 67) | 59 | 8 | <.001 |
| Yes (n = 23) | 8 | 15 | |
| Previous active wound dressing history | | | |
| No (n = 75) | 60 | 15 | .002 |
| Yes (n = 13) | 5 | 8 | |
| Wound depth | | | |
| Grade 1 (n = 20) | 20 | 0 | <.001 |
| Grade 2 (n = 35) | 29 | 6 | |
| Grade 3 (n = 35) | 18 | 17 | |
| Neuropathy | | | |
| No (n = 22) | 21 | 1 | .01 |
| Yes (n = 68) | 46 | 22 | |
| Infection (International Working Group on the Diabetic Foot classification) | | | |
| Grade 1 (n = 14) | 12 | 2 | .025 |
| Grade 2 (n = 19) | 18 | 1 | |
| Grade 3 (n = 49) | 32 | 17 | |
| Grade 4 (n = 8) | 5 | 3 | |

Table 4. Logistic Regression Analysis of Factors Potentially Associated with Isolation of *Pseudomonas aeruginosa* from Wound Culture

| Variable | P Value | Odds Ratio | 95% Confidence Interval |
|--|---------|------------|-------------------------|
| Previous lower-extremity amputation (ipsilateral or contralateral) | <.001 | 12,865 | 3,865–42,439 |
| Previous active wound dressing | .018 | 5,993 | 1,364–26,328 |

Causative pathogens and antibiotic resistance in diabetic foot infections: A prospective multi-center study

Mustafa Hatipoglu ^a, Mesut Mutluoglu ^b, Vedat Turhan ^c, Gunalp Uzun ^d, Benjamin A. Lipsky ^{e,f}, Turk-Day Study Group, Erol Sevim ^g, Hayati Demiraslan ^h, Esmâ Eryilmaz ^h, Cem Ozuguz ⁱ, Ali Memis ^b, Hakan Ay ^b, Bilgin Arda ^j, Serhat Uysal ^j, Vicdan Koksaldi Motor ^k, Cigdem Kader ^l, Ayse Erturk ^m, Omer Coskun ⁿ, Fazilet Duygu ^o, Selma Guler ^p, Fatma Aybala Altay ^q, Aziz Ogutlu ^r, Sibel Bolukcu ^s, Senol Yildiz ^d, Ozlem Kandemir ^t, Halide Aslaner ^u, Arife Polat ^u, Mustafa K. Karahocagil ^v, Kadriye Kart Yasar ^w, Emine Sehmen ^x, Sirri Kilic ^x, Mustafa Sunbul ^y, Serap Gencer ^z, Fatma Bozkurt ^{aa}, Tugba Yanik ^y, Nefise Oztoprak ^{ab}, Ayse Batirel ^z, Hamdi Sozen ^{ac}, Inci Kilic ^{ad}, Ilhami Celik ^{ad}, Bengisu Ay ^{ae}, Selma Tosun ^{ae}, Ayten Kadanali ^{af}, Senol Çomoglu ^{af}, Affan Denk ^{ag}, Salih Hosoglu ^{aa}, Ozlem Aydin ^{ah}, Nazif Elaldi ^{ai}, Serife Akalin ^{aj}, Bahar Kandemir ^{ak}, Ayhan Akbulut ^{ag}, Tuna Demirdal ^{al}, Recep Balik ^{al}, Emel Azak ^{am}, Gonul Sengoz ^{an}

Journal of Diabetes and Its Complications 30 (2016) 910–916

- Çok merkezli, prospektif
 - 2015 EKMUD, 2016 yayın
 - Çalışma süre-periyot?
- 447 hasta / 35 merkez
- 552 örnekleme
 - %48,3 sürüntü
 - %37,2 Doku
 - %2,3 Kemik
 - %10,2 aspirasyon

Table 1

Demographic and clinical characteristics of enrolled patients.

| Parameter | n (%) or mean (SD) |
|----------------------------------|--------------------|
| Mean age, in years | 61,6 (11,8) |
| Male gender | 309 (69.1) |
| Mean diabetes duration, in years | 17 (9,91) |
| Ongoing antibiotic treatment | 316 (71) |
| Peripheral vascular disease | 162 (36) |
| Peripheral neuropathy | 308 (71) |
| Osteomyelitis | 190 (65.7) |
| PEDIS infection score | |
| 2 | 146 (32.7) |
| 3 | 244 (54.6) |
| 4 | 57 (12.8) |
| Etiology of foot wound | |
| Neuropathic | 179 (42.2) |
| Ischemic | 33 (7.7) |
| Neuro-ischemic | 129 (28.9) |
| No ischemia or neuropathy | 106 (23.7) |
| Wound depth | |
| Superficial | 52 (11.7) |
| Full-thickness | 136 (30.6) |
| Bone or joint | 257 (57.8) |
| Wound location | |
| Great toe | 176 (40.4) |
| Small toes | 162 (37.3) |
| Metatarsals | 172 (40) |
| Midfoot | 147 (33.4) |
| Heel | 73 (16.7) |
| Ankle | 40 (9.4) |

Table 2

Frequency of isolation of microorganisms from wounds of patients with a diabetic foot infection.

| Bacteria | PEDIS Grade 2 % (N) | PEDIS Grade 3 % (N) | PEDIS Grade 4 % (N) | TOTAL % (N) |
|--|---------------------------|---------------------------|---------------------------|----------------|
| Gram-positives | 31.03 (18) | 38.22 (99) | 34.29 (24) | 36.43 (141) |
| <i>Staphylococcus aureus</i> (total) | 13.79 (8) | 12.36 (32) | 5.71 (4) | 11.37 (44) |
| -Methicillin-sensitive | 13.79 (8) | 10.42 (27) | 2.86 (2) | 9.56 (37) |
| -Methicillin-resistant | 0 | 1.93 (5) | 2.86 (2) | 1.81 (7) |
| <i>Enterococcus</i> spp. | 6.90 (4) | 10.81 (28) | 10 (7) | 10.08 (39) |
| <i>Streptococcus</i> spp. | 5.17 (3) | 7.72 (20) | 7.14 (5) | 7.24 (28) |
| Coagulase-negative <i>Staphylococcus</i> spp. | 5.17 (3) | 5.79 (15) | 10 (7) | 6.46 (25) |
| Other gram-positives | 0 | 1.54 (4) | 1.43 (1) | 1.29 (5) |
| Gram-negatives | 63.79 (37) | 59.46 (154) | 60 (42) | 60.21 (233) |
| <i>Escherichia coli</i> | 12.07 (7) | 15.83 (41) | 14.29 (10) | 14.99 (58) |
| <i>Pseudomonas aeruginosa</i> | 12.07 (7) | 13.90 (36) | 7.14 (5) | 12.40 (48) |
| <i>Proteus</i> spp. | 13.79 (8) | 9.27 (24) | 7.14 (5) | 9.56 (37) |
| <i>Morganella morganii</i> | 5.17 (3) | 4.63 (12) | 5.71 (4) | 4.91 (19) |
| <i>Enterobacter</i> spp. | 5.17 (3) | 4.25 (11) | 4.29 (3) | 4.39 (17) |
| <i>Klebsiella</i> spp. | 1.72 (1) | 3.47 (9) | 4.29 (3) | 3.36 (13) |
| <i>Acinetobacter</i> spp. | 5.17 (3) | 2.32 (6) | 2.86 (2) | 2.84 (11) |
| <i>Serratia</i> spp. | 1.72 (1) | 1.16 (3) | 2.86 (2) | 1.55 (6) |
| <i>Citrobacter</i> spp. | 0 | 1.16 (3) | 4.29 (3) | 1.55 (6) |
| Other gram-negatives | 6.90 (4) | 3.47 (9) | 7.14 (5) | 4.65 (18) |
| Other organisms | | | | |
| <i>Candida</i> spp. | 1.72 (1) | 1.54 (4) | 2.86 (2) | 1.81 (7) |
| <i>Candida albicans</i> | 3.45 (2) | 0.77 (2) | 0 | 1.03 (4) |
| <i>Finogoldia magna</i> | 0 | 0 | 1.43 (1) | 0.26 (1) |
| <i>Hafnia alvei</i> | 0 | 0 | 1.43 (1) | 0.26 (1) |
| Total | 100 (58) | 100 (259) | 100 (70) | 100 (387) |

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- %36,4 GPB
 - %11,4 *S. aureus*

- %60,2 GNB
 - *E. coli* %15
 - *P. aeruginosa* %12,4
 - *Proteus* spp. %9,6

Increasing incidence of Gram-negative organisms in bacterial agents isolated from diabetic foot ulcers

Vedat Turhan¹, Mesut Mutluoglu, Ali Acar, Mustafa Hatipoğlu, Yalçın Önem, Gunalp Uzun, Hakan Ay, Oral Öncül, Levent Görenek

- Mayıs 2005 - Haziran 2010
- 298 kültür (%55 sürüntü, %36 doku, %9 kemik)
- %83,5 monomikrobiyal
- %16,4 polimikrobiyal
- **Gram - / + bakteri %61,3 / %38,7**
 - *Pseudomonas* species (29.8%),
 - *Staphylococcus aureus* (16.7%),
 - *Enterococcus* species (11.5%),
 - *Escherichia coli* (7.1%),
 - *Enterobacter* species (7.1%).

Predictors for limb loss among patient with diabetic foot infections: an observational retrospective multicentric study in Turkey

Clinical Microbiology and Infection, Volume 21 Number 7, July 2015

N. Saltoglu¹, M. Yemisen¹, O. Ergonul², A. Kadanali³, G. Karagoz³, A. Batirel⁴, O. Ak⁴, H. Eraksoy⁵, A. Cagatay⁵, A. Vatan¹, G. Sengoz⁶, F. Pehlivanoglu⁶, T. Aslan⁷, Y. Akkoyunlu⁷, D. Engin⁸, N. Ceran⁸, B. Erturk⁹, L. Mulazimoglu⁹, O. Oncul¹⁰, H. Ay¹⁰, F. Sargin¹¹, N. Ozgunes¹¹, F. Simsek¹², T. Yildirmak¹², N. Tuna¹³, O. Karabay¹³, K. Yasar¹⁴, N. Uzun¹⁵, Y. Kucukardali¹⁶, M. Sonmezoglu¹⁶, F. Yilmaz¹¹, U. Tozalgan¹⁷, S. Ozer⁴ and M. Ozyazar¹, KLIMIK Turkish Society, Diabetic Foot Study Group

TABLE 3. Microorganisms isolated from patients with diabetic foot infection (n = 208)

| | n (%) |
|--|------------|
| Gram-negative bacteria | 114 (54.8) |
| <i>Pseudomonas aeruginosa</i> | 36 (17.3) |
| <i>Escherichia coli</i> | 30 (14.4) |
| <i>Enterobacter</i> | 11 (5.3) |
| <i>Klebsiella</i> | 10 (4.8) |
| ESBL producing Enterobacteriaceae | 10 (19.6) |
| <i>Proteus</i> | 13 (4.8) |
| <i>Acinetobacter</i> | 10 (4.8) |
| <i>Morganella</i> | 4 (1.9) |
| Gram-positive bacteria | 92 (44.2) |
| Methicillin-sensitive <i>Staphylococcus aureus</i> | 37 (17.8) |
| Methicillin-resistant <i>Staphylococcus aureus</i> | 11 (5.3) |
| Methicillin-resistant coagulase negative <i>Staphylococcus</i> | 18 (8.6) |
| <i>Streptococcus</i> | 14 (6.7) |
| <i>Enterococcus</i> | 12 (5.8) |
| Anaerobic bacteria | 2 (1) |

- 15 mayıs 2011

—

30 mayıs 2013

- 17 merkez

- 455 hasta

Predictors for limb loss among patient with diabetic foot infections: an observational retrospective multicentric study in Turkey

TABLE 4. Predictors of limb loss

| | Univariate analysis | | | Multivariate analysis | | |
|--|---------------------|-----------|--------|-----------------------|-----------|-------|
| | OR | 95% CI | p | OR | 95% CI | p |
| Chronic renal disease | 1.64 | 1.05–2.56 | 0.03 | 0.84 | 0.5–1.41 | 0.520 |
| Age >50 years | 3 | 1.34–6.91 | 0.008 | 2.41 | 0.98–5.88 | 0.053 |
| Male gender | 1.71 | 1.07–2.74 | 0.023 | 1.75 | 1.04–2.96 | 0.034 |
| Duration of DM > 20 years | 2.3 | 1.53–3.54 | <0.001 | 1.9 | 1.18–3.11 | 0.008 |
| Infected ulcer versus cellulitis | 2.6 | 1.61–4.16 | <0.001 | 1.9 | 1.11–3.18 | 0.019 |
| History of amputation | 2 | 1.28–3.19 | 0.002 | 1.23 | 0.72–2.09 | 0.447 |
| History of peripheral vascular disease | 3 | 1.99–4.71 | <0.001 | 2 | 1.26–3.27 | 0.004 |
| Retinopathy | 2.29 | 1.29–4.06 | 0.004 | 2.25 | 1.19–4.25 | 0.012 |
| Leucocyte count >11 000/mm ³ | 1.8 | 1.16–2.67 | 0.008 | 1.4 | 0.88–2.25 | 0.150 |
| Erythrocyte sedimentation rate >70 mm/hr | 1.75 | 1.13–2.71 | 0.011 | 1.6 | 1.01–2.68 | 0.05 |
| Gram-negative bacteria | 1.8 | 1.15–2.86 | 0.01 | 1.8 | 1.08–3.02 | 0.022 |

The Effects of Antimicrobial Resistance and the Compatibility of Initial Antibiotic Treatment on Clinical Outcomes in Patients With Diabetic Foot Infection

The International Journal of Lower
Extremity Wounds
1–8

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Sami Kinikli, MD⁹, and KLİMİK Society, Diabetic Foot Study Group

• 20 haziran 2018 – 20 haziran 2019

- Çok merkezli (5), prospektif
- 247 m.o. / 200 olgu
 - %36,6 polimikrobiyal
 - *Enterococcus sp.* (n = 19, 15.8%),
 - *E. coli* (n = 17, 14.2%), and
 - *S. aureus* (n = 16, 13.3%).
 - %63,4 monomikrobiyal
 - %33 GNB
 - %30,5 GPB

Table 2. The Distribution of Isolated Microorganisms.

| Microorganisms | n | % |
|---------------------------------|-----|------|
| In total | 247 | 100 |
| <i>Staphylococcus aureus</i> | 36 | 14.6 |
| MRSA | 7 | 19.4 |
| CoNS | 23 | 9.3 |
| MR-CoNS | 16 | 69.6 |
| <i>Streptococcus</i> spp. | 28 | 11.3 |
| <i>Enterococcus</i> spp. | 28 | 11.3 |
| <i>Corynebacterium</i> spp. | 19 | 7.7 |
| <i>Escherichia coli</i> | 32 | 13.0 |
| ESBL + <i>E coli</i> | 14 | 43.8 |
| <i>Klebsiella</i> | 20 | 8.1 |
| ESBL + <i>Klebsiella</i> | 6 | 30.0 |
| <i>Pseudomonas aeruginosa</i> | 22 | 8.9 |
| MDR <i>P aeruginosa</i> | 4 | 18.2 |
| <i>Acinetobacter baumannii</i> | 10 | 4.0 |
| Carbapenem-R <i>A baumannii</i> | 8 | 80.0 |
| <i>Proteus</i> spp. | 8 | 3.2 |
| <i>Morganella morganii</i> | 5 | 2.0 |
| <i>Citrobacter</i> spp. | 9 | 3.6 |
| Others | 7 | 2.8 |

Abbreviations: MRSA, methicillin-resistant *S aureus*; MR, methicillin-resistant; CoNS, coagulase-negative *Staphylococcus* spp.; ESBL, extended-spectrum beta-lactamase; MDR, multidrug-resistant.

- *Staphylococcus aureus*
(n = 36, 14.6%)
- *Escherichia coli*
(n = 32, 13.0%)

Impact of the COVID-19 pandemic on diabetic foot patients: A shift in the infectious agent profile towards non fermentative gram-negative bacilli.

Ali Acar¹, Neşe Saltođlu², Necla Tülek¹, Özge Turhan³, Elif Nazlı Serin⁴, Derya Yapar⁵, Murat Kendirci⁶, Serkan Sürme², Banu Yıldız Karaca⁷, Fatma Aybala Altay^{8,24}, Muhammet Rıdvan Tayşı^{8,23}, İrfan Şencan⁸, Esra Tanyel⁹, Heval Can Bilek⁹, Özlem Güler¹⁰, Birsen Mutlu¹⁰, Tolga Aksan¹¹, Fatma Yılmaz Karadađ¹², Ayten Kadanalı^{13,14}, Lütfiye Nilsun Altunal¹³, Seniha Şenbayrak¹⁵, Serpil Erol¹⁵, Öznur Ak¹⁶, Nazire Aladađ¹⁷, Neşe Demirtürk¹⁸, Petek Konya¹⁸, Dilek Bulut¹⁹, Derya Öztürk Engin²⁰, Hasan Murat Arslan²¹, Sibel Dođan Kaya²²

- 14 Eğitim Araştırma veya Üniversite Hastanesi
- **1394 diyabetik ayak hastası**
 - 794'ü pandemi öncesi, 605'i pandemi sırasında
- PÖD: 1 Ocak 2019 – 30 Ocak 2020 PÖD
- PD: 1 Şubat 2020-28 Şubat 2022 PD

Table-1. Demographic variables, risk factors, and other characteristic factors in the baseline of the study cohort.

| | Pre-pandemic Period 794 | | Pandemic period 605 | | Total 1399 | | P |
|---|----------------------------|-----------|------------------------|-----------|---------------|-----------|-------|
| | N | % | N | % | N | % | |
| Female | 262/794 | 33 | 216/605 | 35.7 | 478/1399 | 34.2 | 0.291 |
| ≥ 65 years old | 359 | 45.2 | 257 | 42.5 | 616 | 44 | 0.307 |
| Place of residence (rural/urban) | 236/512 | 17.7/38.4 | 162/422 | 27.7/72.3 | 398/934 | 29.9/70.1 | 0.132 |
| DM Type1/2 | 37/748 | 4.7/95.3 | 23/570 | 3.9/96.1 | 60/1318 | 4.4/95.6 | 0.452 |
| Hypertension | 499 | 63 | 385 | 63.6 | 884 | 63.3 | 0.808 |
| Chronic renal failure | 238 | 30 | 183 | 30.3 | 421 | 30.1 | 0.908 |
| Dialysis | 91 | 11.5 | 57 | 9.4 | 148 | 10.6 | 0.217 |
| Chronic heart disease | 184 | 24.4 | 133 | 23.2 | 317 | 23.9 | 0.592 |
| Chronic arterial disease | 401 | 50.6 | 314 | 52 | 715 | 51.2 | 0.599 |
| Chronic lung disease | 84 | 11.2 | 47 | 8.2 | 130 | 9.8 | 0.70 |
| Chronic liver disease | 17 | 2.3 | 6 | 1 | 23 | 1.7 | 0.094 |
| Smoking | 228 | 36.8 | 177 | 36.4 | 405 | 36.6 | 0.903 |
| Alcohol abuse | 29 | 4.8 | 34 | 7.2 | 63 | 5.9 | 0.087 |
| Hospitalization in the last 3 months | 241 | 31.8 | 181 | 31.4 | 422 | 31.6 | 0.898 |
| Antibiotic use in the last 3 months | 485 | 64.2 | 369 | 64 | 854 | 64.1 | 0.939 |
| Infection in the last 3 months | 517 | 69.9 | 385 | 67.5 | 902 | 68.9 | 0.368 |
| Upper respiratory tract infections | 7 | 0.9 | 1 | 0.2 | 8 | 0.6 | 0.076 |
| Urinary tract infection | 8 | 1.1 | 14 | 2.4 | 22 | 1.7 | 0.055 |
| Pneumonia | 12 | 1.6 | 23 | 4 | 35 | 2.6 | 0.007 |
| Diabetic foot infections | 477 | 63.5 | 358 | 61.9 | 835 | 62.8 | 0.555 |
| DFU history | 547 | 70.3 | 419 | 69.7 | 966 | 70.1 | 0.812 |
| Amputation history | 206 | 26.4 | 156 | 26.4 | 362 | 26.4 | 0.999 |
| Transfer from external center | 137 | 17.4 | 114 | 18.8 | 251 | 18 | 0.476 |

Table-5. Distribution of causative microorganisms detected in diabetic foot infection:

| | Pre-pandemic Period (794) | | Pandemic period (605) | | P |
|--------------------------------|------------------------------|-------------|--------------------------|-------------|---------------|
| | N | % | N | % | |
| Culture sampling | 618/794 | 79.1 | 397/605 | 65.6% | <0.00001 |
| Positive aspiration culture | 131/310 | 42.3 | 81/181 | 44.8 | 0.5892 |
| Positive tissue sample culture | 336/496 | 67.7 | 198/310 | 63.9 | 0.25848 |
| Positive Blood culture | 36/399 | 9 | 20/198 | 10.1 | 0.6672 |
| Total culture positivity | 503/1202 | 41.8 | 299/ 689 | 43.4 | 0.50926 |
| <i>Staphylococcus</i> spp. | 137/503 | 27.2 | 59/299 | 19.7 | 0.0168 |
| MSSA | 49 | 9.7 | 24 | 8.0 | 0.4122 |
| MRSA | 26 | 5.2 | 21 | 7.0 | 0.2801 |
| MSKNSA | 30 | 6.0 | 4 | 1.3 | 0.0017 |
| MRKNSA | 32 | 6.4 | 11 | 3.7 | 0.1031 |
| GNEB | 182/503 | 36.2 | 108/299 | 36.1 | 0.9840 |
| <i>E. coli</i> | 31 | 6.2 | 17 | 5.7 | 0.7794 |
| ESESBL- <i>E. coli</i> | 34 | 6.8 | 21 | 7.0 | 0.8886 |
| <i>Klebsiella</i> spp. | 12 | 2.4 | 9 | 3.0 | 0.5892 |
| ESBL- <i>Klebsiella</i> | 16 | 3.2 | 15 | 5.0 | 0.1936 |
| <i>Enterobacter</i> spp. | 26 | 5.2 | 12 | 4.0 | 0.4593 |
| XDR- <i>Enterobacter</i> | 7 | 1.4 | 2 | 0.7 | 0.3472 |
| <i>Serratia</i> spp. | 3 | 0.6 | 4 | 1.3 | 0.2757 |
| <i>Citrobacter</i> spp. | 11 | 2.2 | 5 | 1.7 | 0.6170 |
| <i>Morganella morganii</i> | 6 | 1.2 | 8 | 2.7 | 0.1211 |
| <i>Pantoea</i> spp. | 1 | 0.2 | 0 | - | 0.4413 |
| <i>Proteus</i> spp. | 31 | 6.2 | 15 | 5.0 | 0.4965 |
| NFGNB | 92/503 | 18.3 | 68/299 | 22.7 | 0.1260 |
| <i>Pseudomonas</i> spp. | 69 | 13.7 | 49 | 16.4 | 0.3030 |
| CR <i>Pseudomonas</i> | 22 | 4.4 | 24 | 8.0 | 0.0316 |
| <i>Acinetobacter</i> spp. | 18 | 3.6 | 16 | 5.4 | 0.5755 |
| CR <i>Acinetobacter</i> spp. | 9 | 1.8 | 7 | 2.3 | 0.5892 |
| XDR <i>Acinetobacter</i> spp. | 3 | 0.6 | 3 | 1.0 | 0.5157 |
| PDR <i>Acinetobacter</i> spp. | 0 | 0.0 | 1 | 0.3 | 0.1936 |
| <i>Stenotrophomonas</i> spp. | 4 | 0.8 | 3 | 1.0 | 0.7566 |
| <i>Enterococcus</i> spp. | 62/503 | 12.3 | 33/299 | 11.0 | 0.5823 |
| VR- <i>Enterococcus</i> spp. | 2 | 0.4 | 4 | 1.3 | 0.1362 |
| <i>Streptococcus</i> spp. | 28/503 | 5.6 | 24/299 | 8.0 | 0.1707 |
| <i>Corinebacterium</i> spp. | 3/503 | 0.6 | 0/299 | - | 0.1802 |
| <i>Candida</i> spp. | 4/503 | 0.8 | 6/299 | 2.0 | 0.1336 |

Sonuç

- Olguların ~ %50 > 65 yaş
 - Ort. yaş 62
- 1/3 son 3 ayda **hastaneye yatış**
- ~ %65 son 3 ayda **antibiyotik kullanım**
- %70 DAU, %62 DAE öyküsü
- ¼ ampütasyon öyküsü (%26)
- %33 sigara
- %30 KRY, %10 Diyaliz

- **DAE ile ilişkili**
 - %20 apse
 - %55 osteomyelit
 - Semptom süresi >2 ay
- İleri yaş
- Antibiyotik kullanımı
- Hastaneye yatış
- Gecikmiş vaka
- Sosyal ve eğitim
- Kronik Hastalık
- Öz bakım eksikliği

Sonuç

- Olguların ~ %50 > 65 yaş
 - Ort. yaş 62

- **DAE ile ilişkili**
 - %20 apse
 - %55 osteomyelit

• 1/2
ya

• ~ 9
an

• %7

• 1/4
(%

- **Dirençli m.o. enfeksiyon**
- **Gram negatif bakteri riskinde artış**
- ***Pseudomonas* enfeksiyonunda artış**

• %33 sigara

• %30 KRY, %10 Diyaliz

- Kronik Hastalık

- Öz bakım eksikliği