Diyabet ve Bağışıklama

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SBÜ Gülhane Tıp Fakültesi

Endokrinoloji ve Metabolizma Hastalıkları BD.

Türkiye EKMUD 4.Erişkin Bağışıklama Akademisi
24 Eylül 2022-Ankara

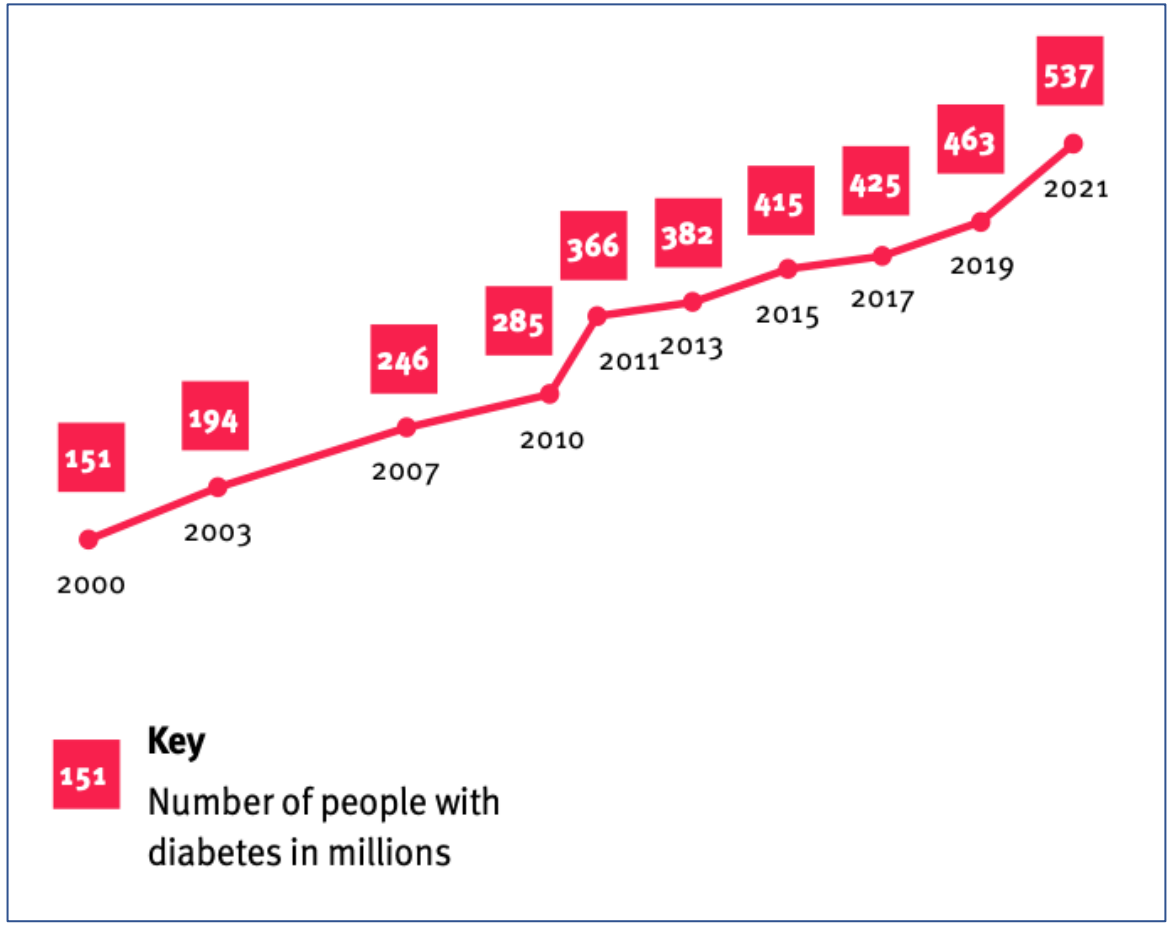
İçerik…

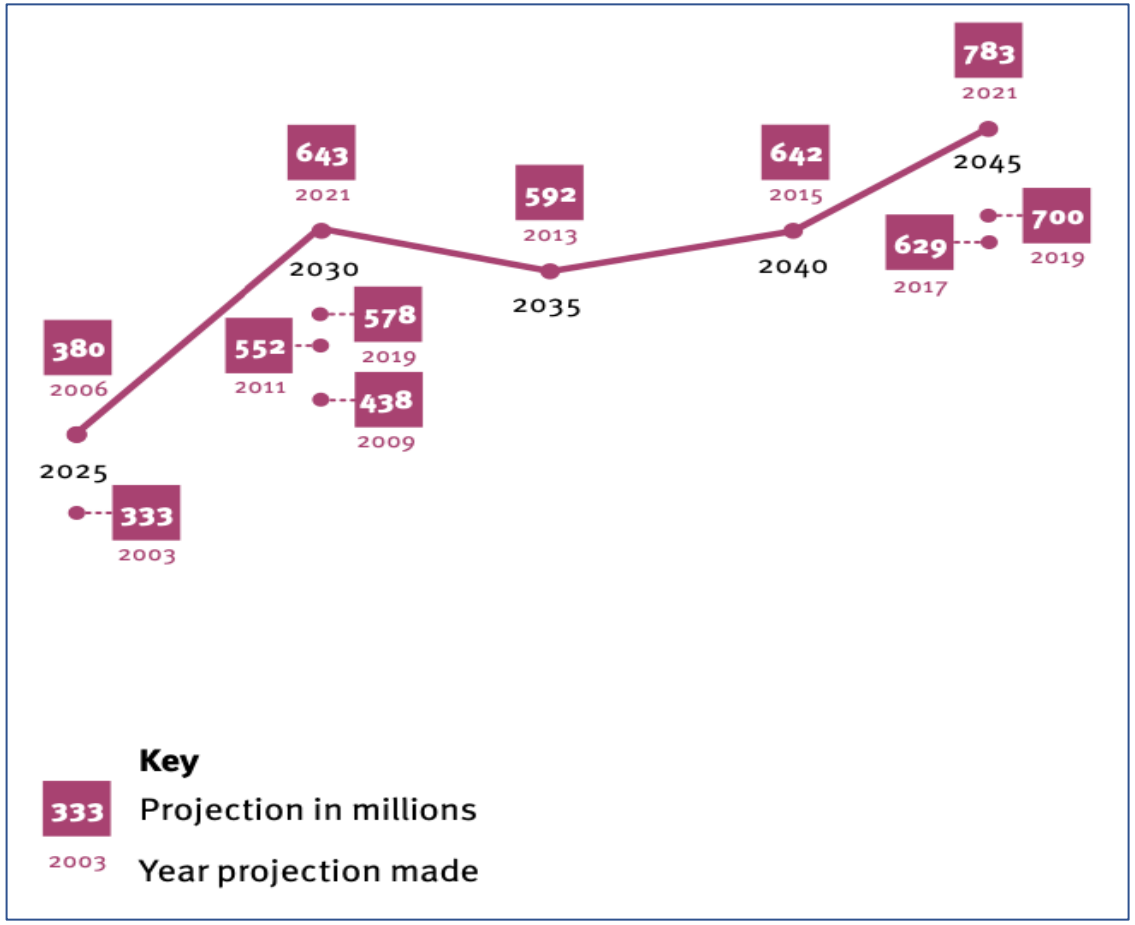
- Dünyada ve ülkemizde Diyabet sıklığı
- Diyabette enfeksiyon patogenezi ve sıklığı
- Diyabetli hastada aşı önerileri
- Ülkemizde durum nasıl?

Dünyada diyabet sıklığı…

IDF Diabetes Atlas – 10th edition (2021)

Dünyada diyabet sıklığı…





IDF Diabetes Atlas 2021 – 10th edition

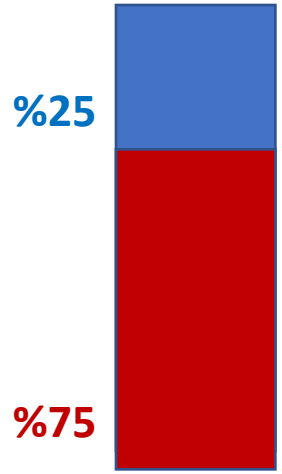
Ülkemizde durum nasıl?

Satman I, et al. Diabetes Care. 2002; 25(9): 1551-1556.
Onat, A., et al. (2017). TEKHARF 2017 (pp. 1–304). Logos Tıp Yayıncılık.
Satman I, et al. Eur J Epidemiol. 2013; 28(2):169-80.

Türkiye’de diyabetin maliyeti…

- Türkiye’de Sağlık Harcamalarının %23’ü Diyabet için

- **Diyabetin tedavisi**
- **Komplikasyonlarının tedavisi**

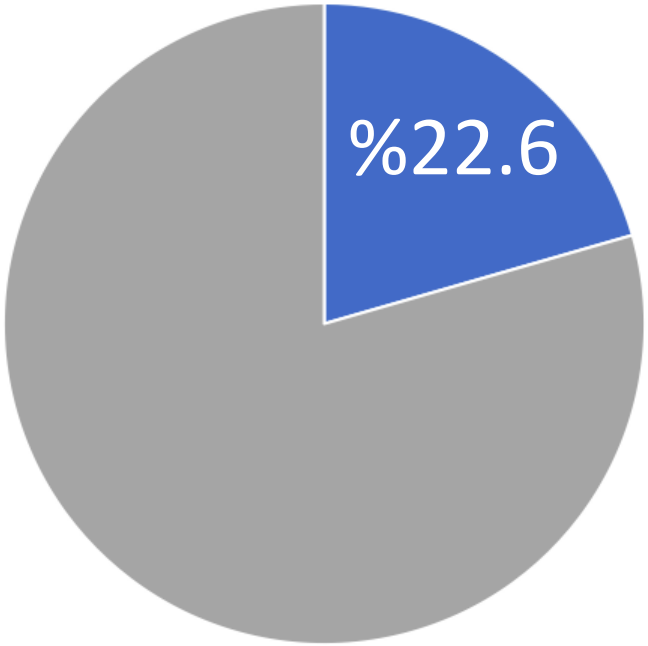


Türkiye Diyabet Onleme ve Kontrol Programı (Turkey Diabetes Prevention and Control Programme) 2011 – 2014.

2019 - Sağlık Bütçe Payı

2019 yılı toplam sağlık bütçesi 157 milyar TL

Diyabet
35,6 milyar TL



Avrasya Tüneli maliyeti:

20 milyar TL

3. köprü maliyeti:

15 milyar TL

TC Strateji ve Bütçe Başkanlığı web sayfası

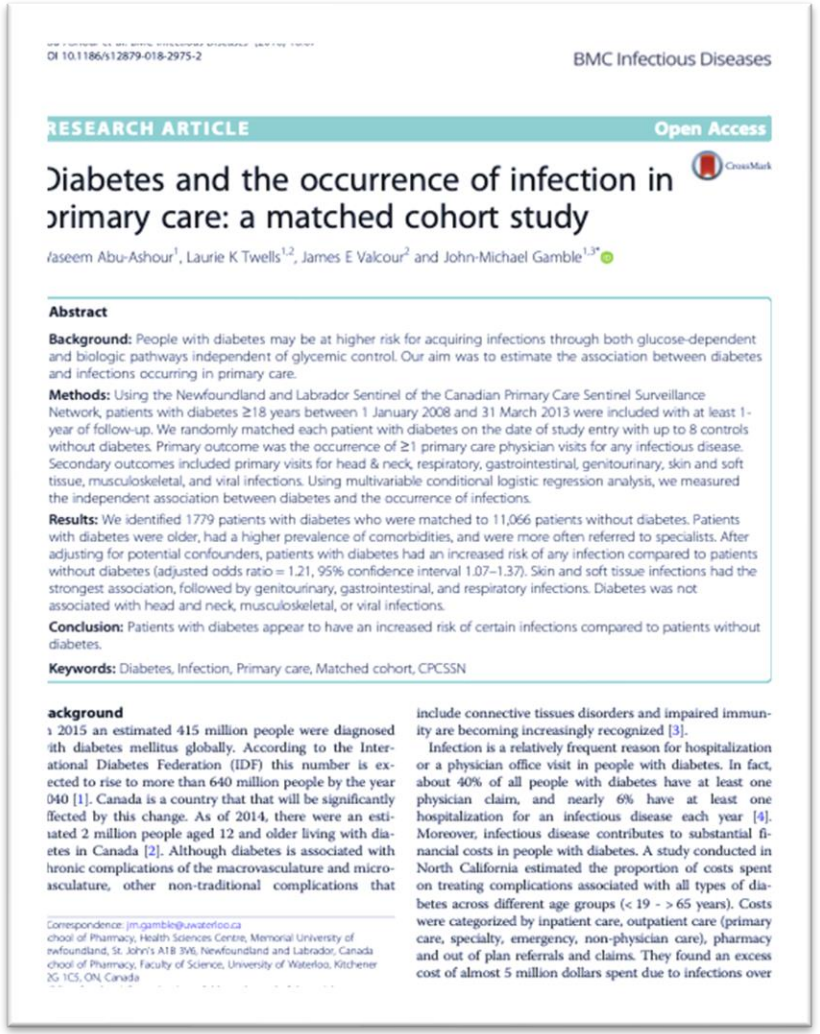
Diyabet ve koruyucu hekimlik…

- Mikrovasküler komplikasyonlar
  - Retinopati
  - Nefropati
  - Nöropati
- Makrovasküler komplikasyonlar
  - Koroner arter hastalığı
  - Periferik arter hastalığı
  - Serebrovasküler hastalık

- Kanser taraması
- Dental tarama
- Bağışıklama
- Ayak bakımı
- Gebelik planlaması

Diyabet hastalarında enfeksiyon sıklığı…

Type of Infection	Adjusted OR	95%CI	*P* value
Any Infection	1.21	1.07–1.37	0.002
Head & Neck	1.13	0.89–1.43	0.313
Respiratory	1.30	1.13–1.48	< 0.001
Gastrointestinal	1.40	1.12–1.75	0.003
Genitourinary	1.48	1.22–1.81	< 0.001
Skin & Soft Tissue	1.66	1.37–2.02	< 0.001
Musculoskeletal	1.05	0.87–1.28	0.598
Viral	1.15	0.86–1.54	0.351



DOI 10.1186/s12879-018-2975-2

BMC Infectious Diseases

RESEARCH ARTICLE Open Access

Diabetes and the occurrence of infection in primary care: a matched cohort study

Yaseem Abu-Ashour[1], Laurie K Twells[1,2], James E Valcour[2] and John-Michael Gamble[1,3*]

Abstract

Background: People with diabetes may be at higher risk for acquiring infections through both glucose-dependent and biologic pathways independent of glycemic control. Our aim was to estimate the association between diabetes and infections occurring in primary care.

Methods: Using the Newfoundland and Labrador Sentinel of the Canadian Primary Care Sentinel Surveillance Network, patients with diabetes ≥18 years between 1 January 2008 and 31 March 2013 were included with at least 1-year of follow-up. We randomly matched each patient with diabetes on the date of study entry with up to 8 controls without diabetes. Primary outcome was the occurrence of ≥1 primary care physician visits for any infectious disease. Secondary outcomes included primary visits for head & neck, respiratory, gastrointestinal, genitourinary, skin and soft tissue, musculoskeletal, and viral infections. Using multivariable conditional logistic regression analysis, we measured the independent association between diabetes and the occurrence of infections.

Results: We identified 1779 patients with diabetes who were matched to 11,066 patients without diabetes. Patients with diabetes were older, had a higher prevalence of comorbidities, and were more often referred to specialists. After adjusting for potential confounders, patients with diabetes had an increased risk of any infection compared to patients without diabetes (adjusted odds ratio = 1.21, 95% confidence interval 1.07–1.37). Skin and soft tissue infections had the strongest association, followed by genitourinary, gastrointestinal, and respiratory infections. Diabetes was not associated with head and neck, musculoskeletal, or viral infections.

Conclusion: Patients with diabetes appear to have an increased risk of certain infections compared to patients without diabetes.

Keywords: Diabetes, Infection, Primary care, Matched cohort, CPCSSN

ackground

› 2015 an estimated 415 million people were diagnosed ith diabetes mellitus globally. According to the International Diabetes Federation (IDF) this number is expected to rise to more than 640 million people by the year 040 [1]. Canada is a country that that will be significantly ffected by this change. As of 2014, there were an estiated 2 million people aged 12 and older living with diaetes in Canada [2]. Although diabetes is associated with hronic complications of the macrovasculature and microasculature, other non-traditional complications that include connective tissues disorders and impaired immunity are becoming increasingly recognized [3].

Infection is a relatively frequent reason for hospitalization or a physician office visit in people with diabetes. In fact, about 40% of all people with diabetes have at least one physician claim, and nearly 6% have at least one hospitalization for an infectious disease each year [4]. Moreover, infectious disease contributes to substantial financial costs in people with diabetes. A study conducted in North California estimated the proportion of costs spent on treating complications associated with all types of diabetes across different age groups (< 19 - > 65 years). Costs were categorized by inpatient care, outpatient care (primary care, specialty, emergency, non-physician care), pharmacy and out of plan referrals and claims. They found an excess cost of almost 5 million dollars spent due to infections over

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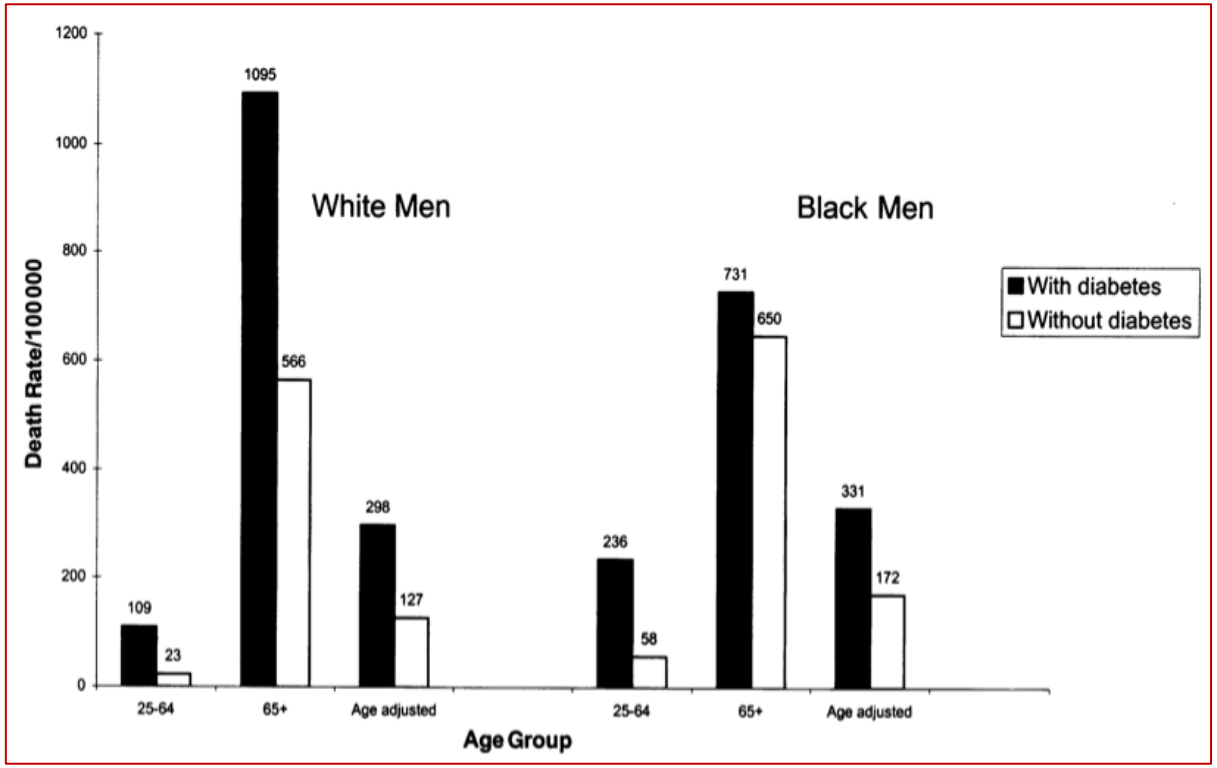
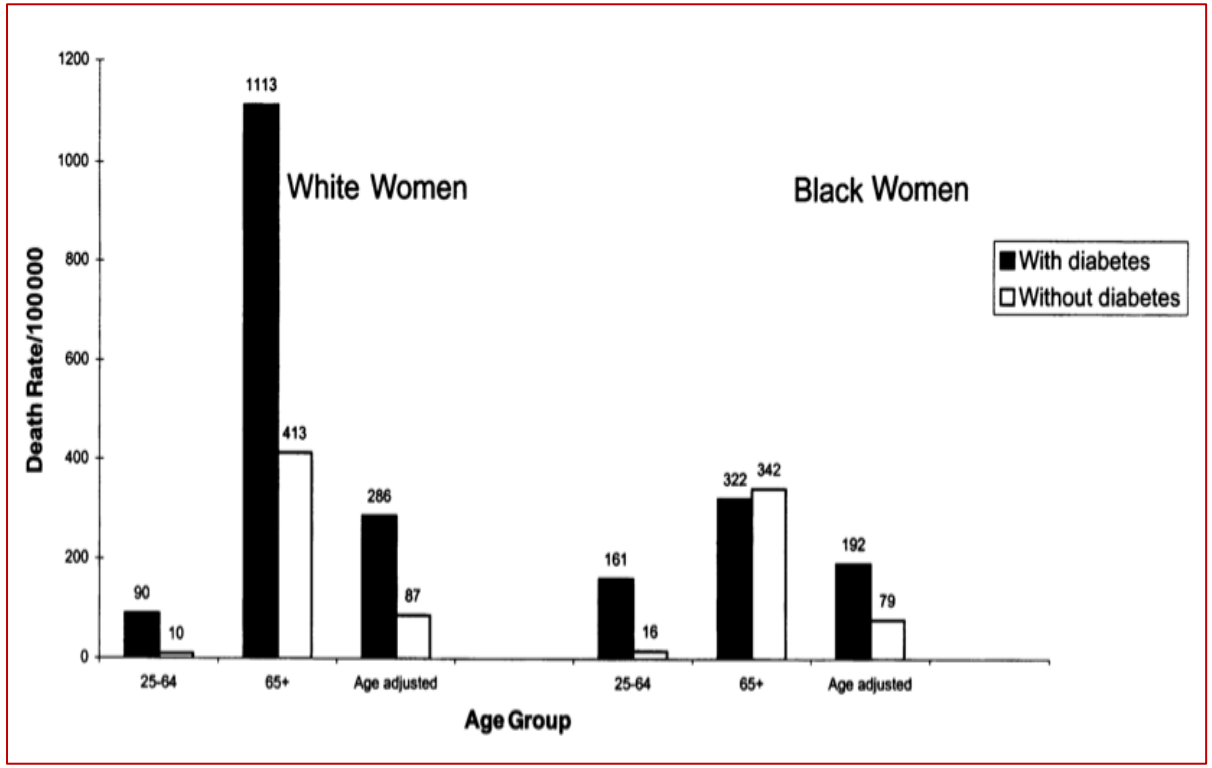
chool of Pharmacy, Faculty of Science, University of Waterloo, Kitchener 2G 1C5, ON, Canada

BMC Infect Dis. 2018;18(1):67

Artmış mortalite riski….

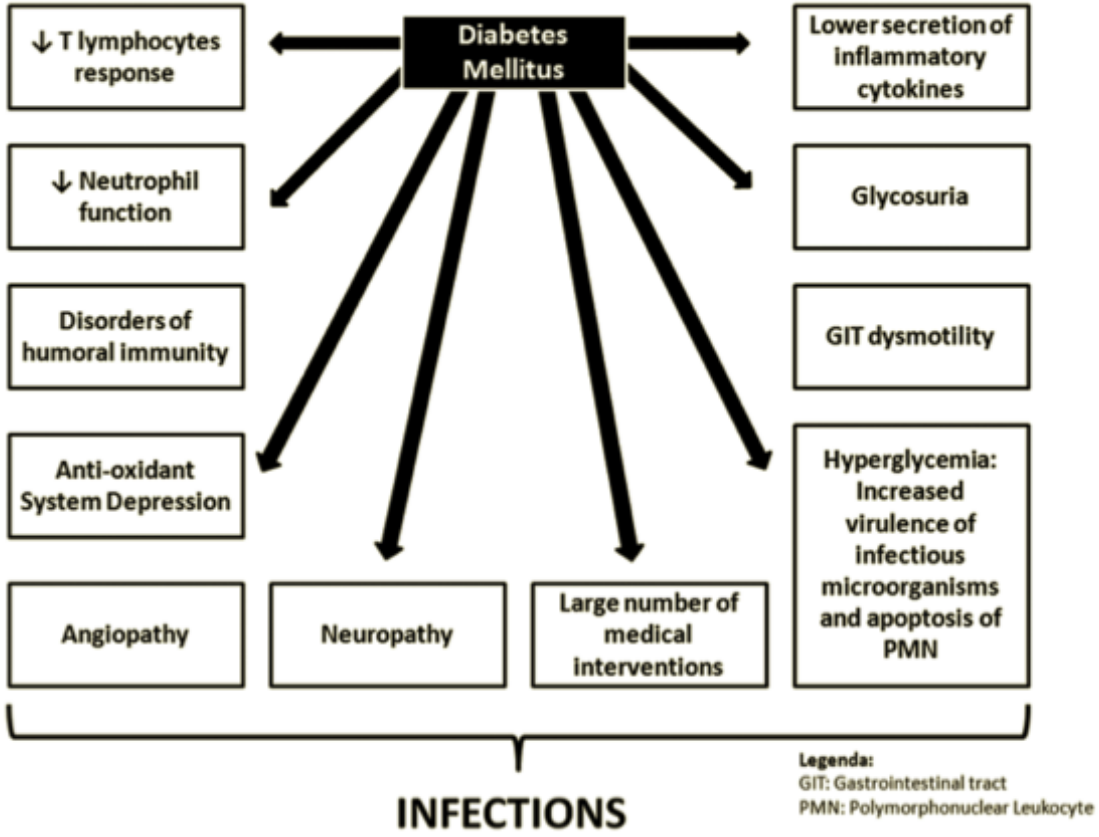




Am J Public Health. 1999 Nov;89(11):1715-21

Enfeksiyon sıklığını arttıran faktörler…

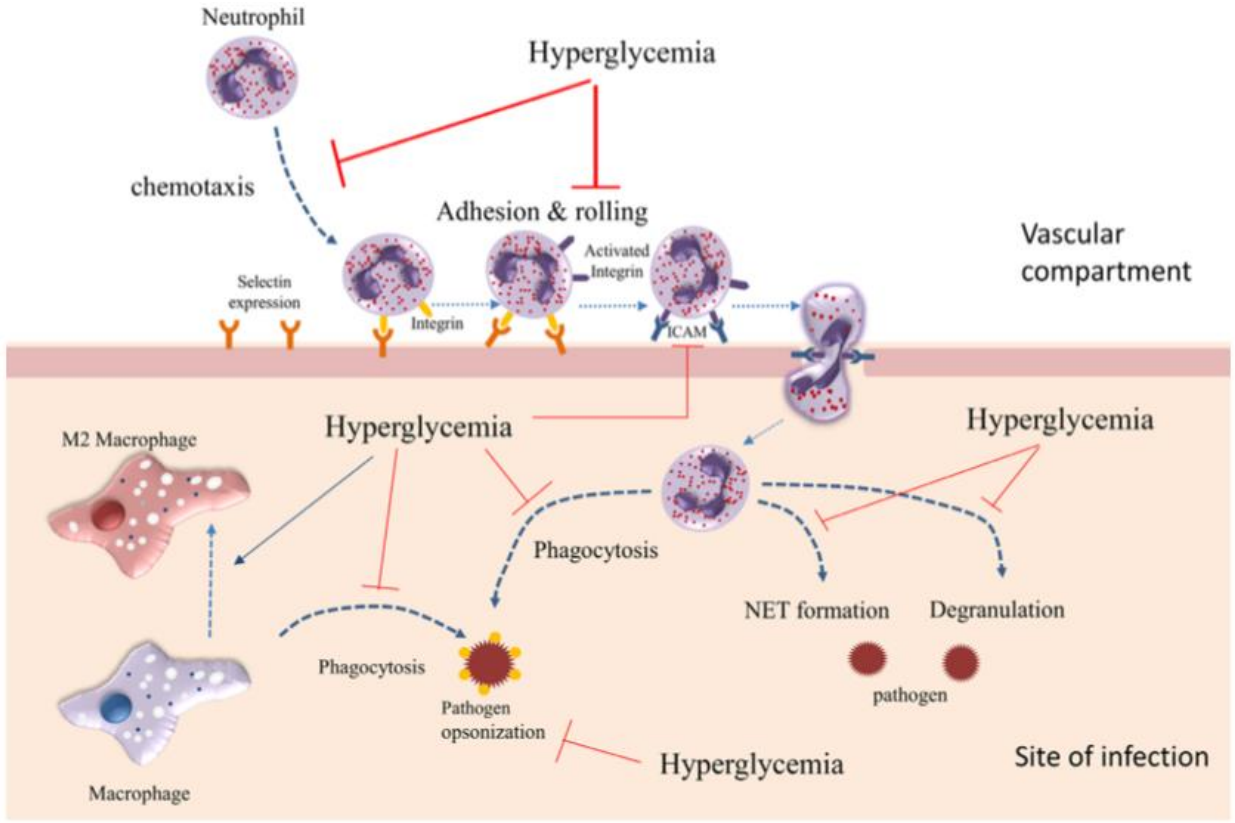
- Hiperglisemiye bağlı immün cevapta bozulma
- Vasküler yetersizlik
- Periferal sensorial nöropati
- Otonom nöropati
- Ciltte ve mukozalarda patojen bakteri kolonizasyonu



UpToDate, Erişim Eylül 2022
Indian Journal of Endocrinology and Metabolism 2012;16:1

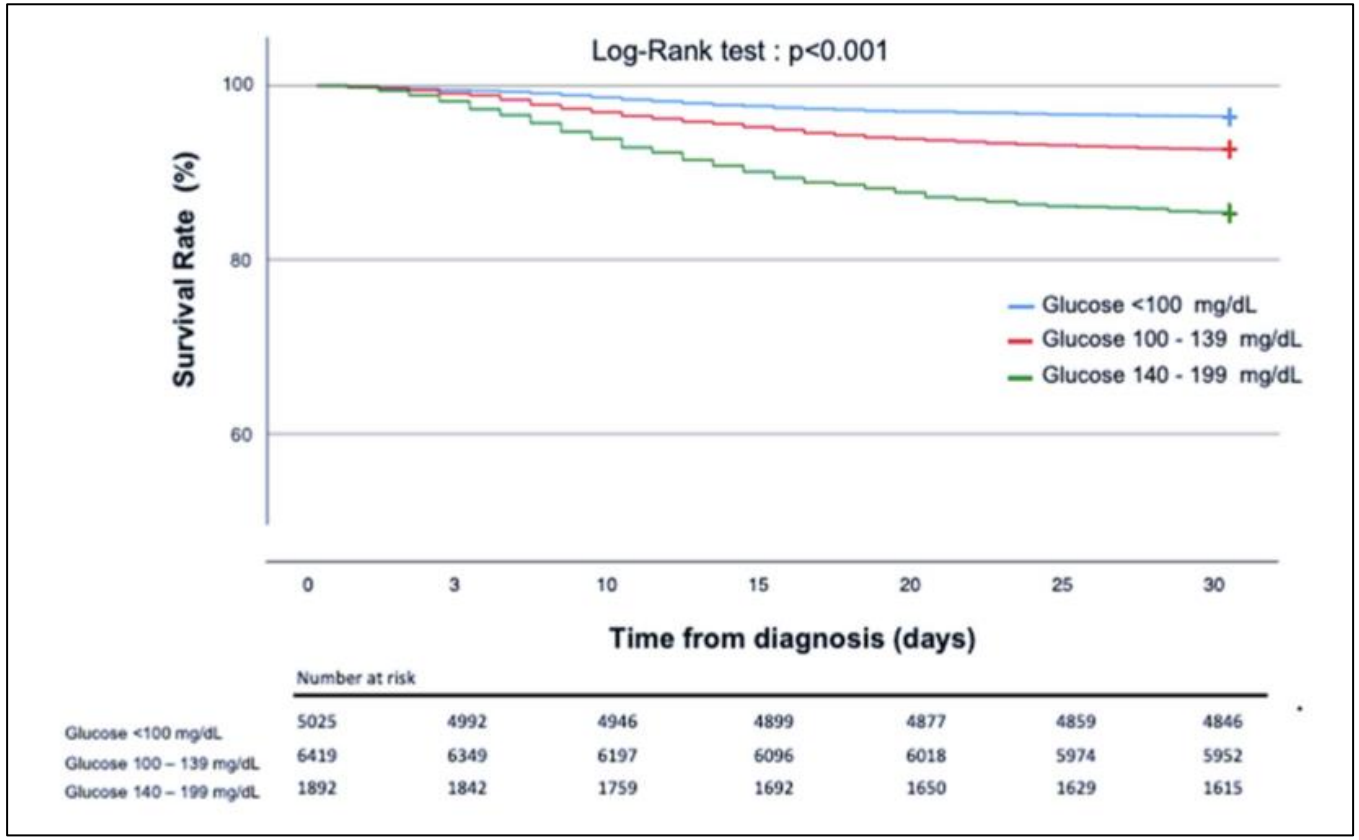
Hipergliseminin immün sisteme etkisi

- Kan viskozitesi, pH ve diğer biyokimyasal parametrelerde değişiklikler
- Enfekte hücrelere uygun ortam
- Artmış inflamatuvar cevap
- Artmış oksidatif stress



Current Diabetes Reviews, 2020;16:5
Front Public Health. 2021;9:559595.

Hipergliseminin etkisi…



Endocrine (2021) 73:261–269
https://doi.org/10.1007/s12020-021-02789-9

ORIGINAL ARTICLE

Clinical outcomes of non-diabetic COVID-19 patients with different blood glucose levels: a nationwide Turkish study (TurCoGlycemia)

Cem Haymana[1] · Ibrahim Demirci[1] · Ilker Tasci[2] · Erman Cakal[3] · Serpil Salman[4] · Derun Ertugrul[5] · Naim Ata[6] · Ugur Unluturk[7] · Selcuk Dagdelen[7] · Aysegul Atmaca[8] · Mustafa Sahin[9] · Osman Celik[10] · Tevfik Demir[11] · Rifat Emral[9] · Ibrahim Sahin[12] · Murat Caglayan[13] · Ilhan Satman[14,15] · Alper Sonmez[16]

Abstract

Purpose New coronavirus disease 2019 (COVID-19) has a worse prognosis in patients with diabetes. However, there are insufficient data about the effect of hyperglycemia on COVID-19 prognosis in non-diabetic patients. This study aimed to investigate the relationship between random blood glucose levels measured at the time of diagnosis and prognosis of COVID-19 disease in non-diabetic patients.

Methods A nationwide retrospective cohort of non-diabetic patients with confirmed COVID-19 infection from 11 March to 30 May 2020 in the Turkish Ministry of Health database was investigated. The patients were stratified into three groups according to blood glucose levels which were <100 mg/dL in group-1, in the range of 100–139 mg/dl in group-2, and the range of 140–199 mg/dl in group-3. Clinical characteristics and outcomes were compared among the groups. The primary outcome was mortality.

Results A total of 12,817 non-diabetic patients (median age [IQR]: 44 [25] years, females: 50.9%) were included. Patients in group-2 (5%) and group-3 (14%) had higher mortality rates than patients in group-1 (2.1%). The rates of hospitalization, hospital stays longer than 8 days, intensive care unit (ICU) admission, ICU stay more than 6 days, and mechanical ventilation were also significantly higher in group-3 patients. Likewise, glucose levels in the range of 140–199 mg/dL were an independent associate of mortality and composite of ICU admission and/or mechanical ventilation.

Conclusion Hyperglycemia at the time of COVID-19 diagnosis is associated with poor prognosis in non-diabetic patients. Clinicians should be more careful in the treatment of non-diabetic COVID-19 patients with hyperglycemia.

Keywords COVID-19 · SARS-CoV-2 · Hyperglycemia · Hospitalization · ICU admission · Mechanical ventilation · Mortality

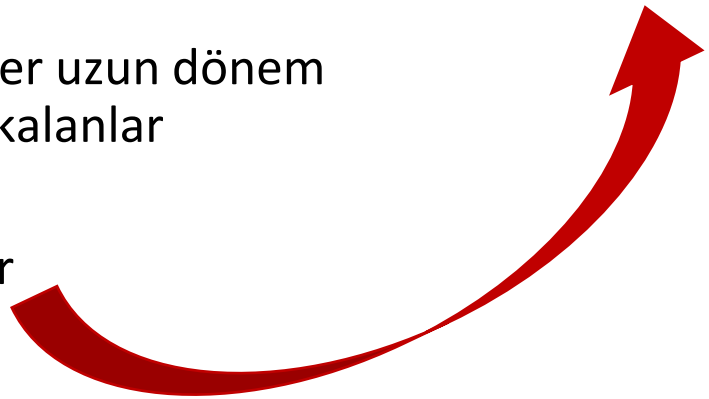
REHBER İSMİ	ÖNERİLEN AŞILAR
Amerikan Diyabet Birliği Diyabette Tıbbi Bakım Standartları Kılavuzu[10]	İnfluenza, Pnömokok, Hepatit B
Kanada Diyabet Yönetimi ve Korumasında Klinik Uygulamalar Kılavuzu[11]	İnfluenza, Pnömokok, Hepatit B, Herpes zoster
Avustralya Tip 2 Diyabet Yönetiminde Genel Uygulama Kılavuzu[12]	İnfluenza, Pnömokok, DTB (Difteri, tetanoz, boğmaca)
TEMD (Türkiye Endokrinoloji ve Metabolizma Derneği) Diabetes Mellitus ve Komplikasyonlarının Tanı, Tedavi Ve İzlem Kılavuzu[13]	İnfluenza, Pnömokok, Hepatit B
TÜRKDİAB (Türkiye Diyabet Vakfı) Diyabet Tanı ve Tedavi Rehberi[14]	İnfluenza, Pnömokok, Hepatit B
EKMUD (Türkiye Enfeksiyon Hastalıkları Ve Klinik Mikrobiyoloji Uzmanlık Derneği) Erişkin Bağışıklama Rehberi[6]	İnfluenza, Pnömokok, Herpes zoster (Zona)
ACIP (Amerikan İmmunizasyon Danışma Kurulu)[15]	İnfluenza, Pnömokok, Hepatit B, Herpes zoster (Zona), DTB (Difteri, tetanoz, boğmaca)

Diyabetli Bireyler İçin Ulusal ve Uluslararası Rehberlerin Aşı Önerileri

İnfluenza enfeksiyonu…

- Komplikasyon riski yüksek hastalar
  - 5 yaş altındaki çocuklar (özellikle 2 yaşından küçük çocuklar)
  - 65 yaş ve üzerindeki kişiler
  - Gebe kadınlar (postpartum 2 hafta dahil)
  - Bakımevlerinde ve diğer uzun dönem tedavi merkezlerinde kalanlar
  - Kronik hastalığı olanlar

- Diyabet hastalarında
  - Hastaneye yatış sıklığında 3 kat
  - Yoğun bakım yatış sıklığında 4 kat
  - Mortalitede 2 kat



Diabetes Care 33:1491–1493, 2010

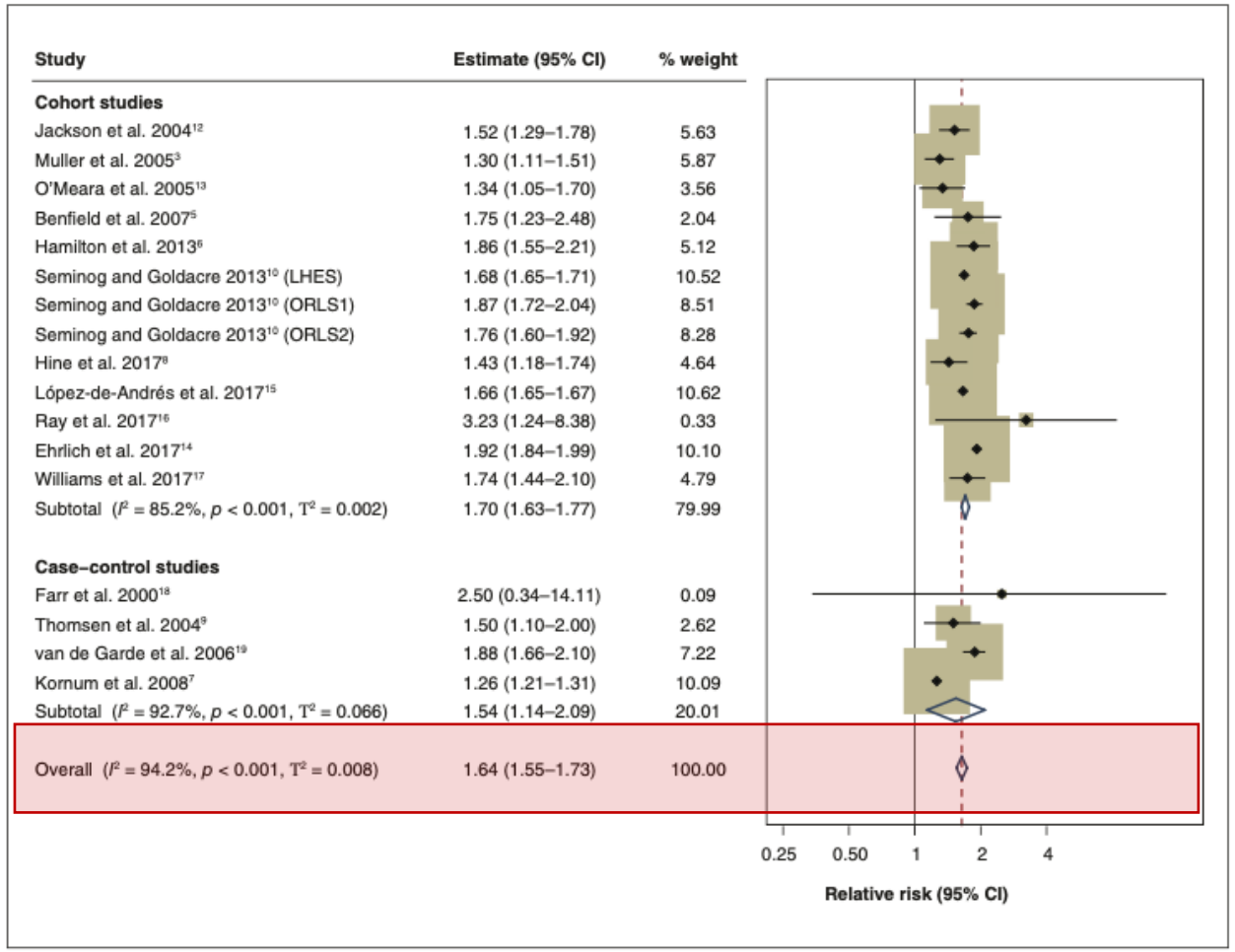
Diyabet hastalarında influenza aşılaması…

- 6 aylıktan itibaren tüm diyabetli bireylere
- Yılda bir defa
- Kuadrivalan aşılar tercih edilmeli
- Yaşlılarda ve bağışıklığı baskılanmış olanlarda daha kısa süreli koruma

- Komplikasyon sıklığında %56
- Hastane yatış sıklığında %43-54
- Mortalite %28-58

Thorax 2013;68:658–63
Diabetes Care 2006; 29:1771–76
TEMD, Diabetes Mellitus ve Komplikasyonlarının Tanı, Tedavi ve İzlem Kılavuzu-2022

Pnömokok enfeksiyonu…



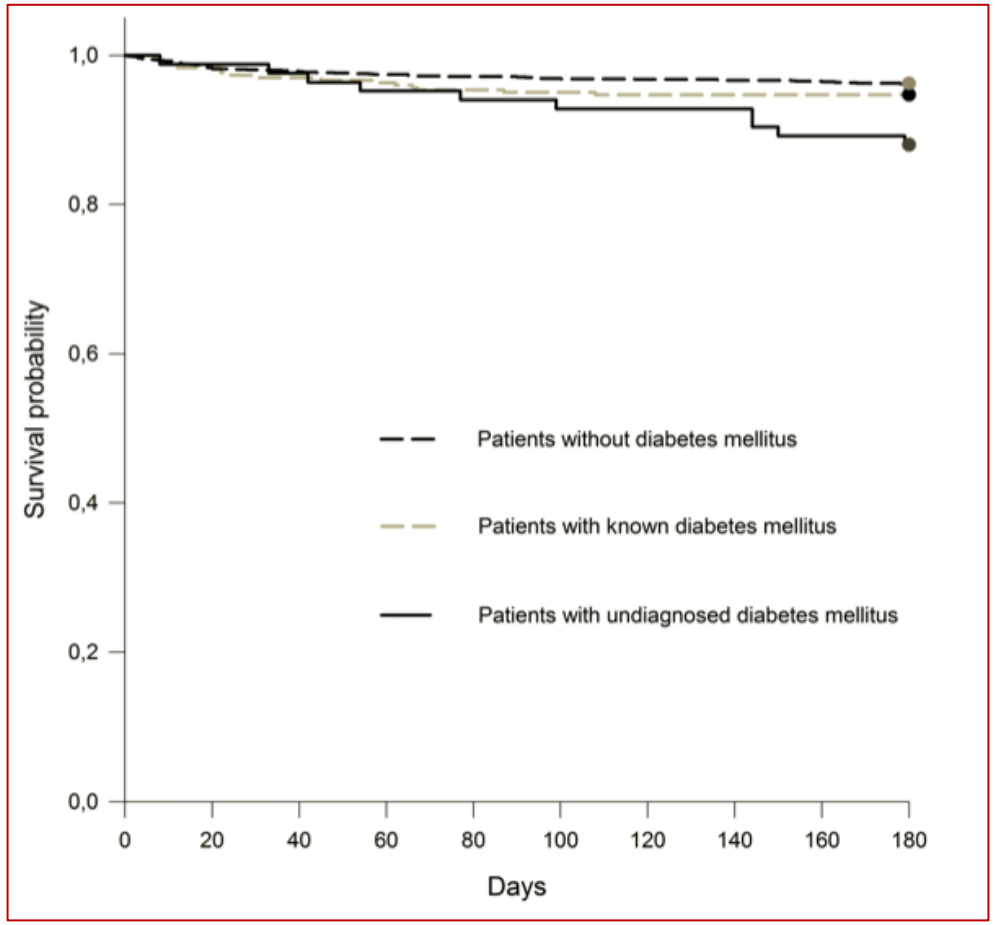
Diyabet pnömoni için bir risk faktörü

Hastaneye yatış riskinde artış

Mortalite artışı

CMAJ Open. 2021 Jan 25;9(1):E62-E70

Diyabet-pnömoni ilişkisi



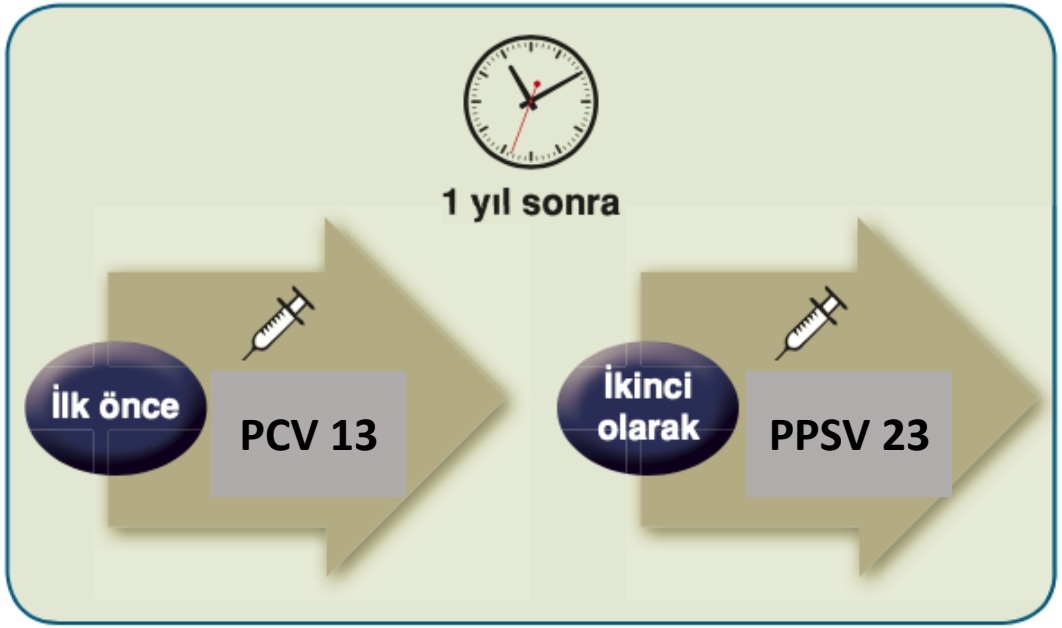
- Çok merkezli çalışma
- 1961 pnömoni hastası
- Diyabet sıklığı %15
- Tanı almamış diyabet oranı %5
- Tanı almamış prediyabet oranı %37.5
- Mortalite riski daha fazla; %12.1 vs %3.8

Clin Infect Dis. 2017 Nov 29;65(12):2091-2098

Diyabet hastalarında Pnömokok aşılaması

- İki aşı tipi
  - 13 valanlı konjuge pnömokok aşısı (PCV13)
  - 23 valanlı polisakkarid pnömokok aşısı (PPSV23)

- Ülkemizde dual aşılama önerilmekte



Diyabetik birey aşılama rehberi, 2019

Diyabet hastalarında Pnömokok aşılaması

- 65 yaş üzeri hastalar
  - Daha önce hiç aşılanmamış → 1 doz PCV-13
  - Daha önce PCV-13 ile aşılanma → **En az 1 yıl sonra** → PPSV-23
  - Daha önce PPSV-23 ile aşılanma → **En az 1 yıl sonra** → PCV-13
  - ≤65 yaşta PCV-13 + PPSV-23 ile aşılanma → **5 yıl sonra** → PPSV-23

Diyabetik birey aşılama rehberi, 2019

TEMD, Diabetes Mellitus ve Komplikasyonlarının Tanı, Tedavi ve İzlem Kılavuzu-

Diyabet hastalarında Pnömokok aşılaması

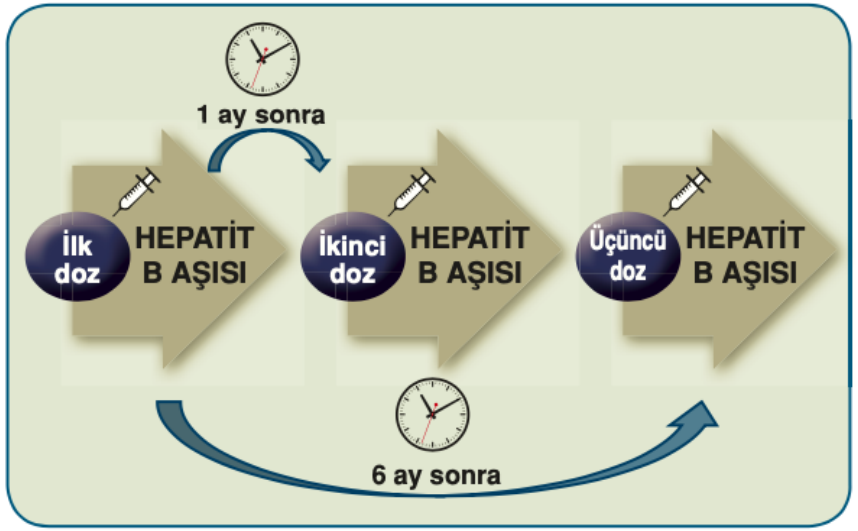
- Amerikan Diyabet Derneği (ADA) önerileri
  - 19-64 yaş aralığında tek doz PPSV-23
    - 65 yaş üzerinde tekrar dozu
  - PCV-13 rutin olarak önerilmemekte
  - İmmünsüprese hastalarda PCV-13 önerilmekte
    - Aspleni
    - Son dönem böbrek yetmezliği
    - Koklear implant
    - BOS kaçakları

Standards of Medical Care in Diabetes—2022. Diabetes Care 2022;45 (Suppl. 1):S46–S59

Diyabet hastalarında Hepatit-B aşılaması

- Genel popülasyona göre risk daha fazla
  - Enfekte kan ile temas riskinde artış
  - Uygunsuz malzeme (glukoz ölçüm cihazı ve enfekte iğneler) kullanımı

- **<u>19-59 yaş arası diyabetli hastalar</u>**



<u>60 yaş ve üzeri diyabetli hastalar</u>

- Koruyuculuk düşük
- Yüksek riskli hastalarda
- Hastanın durumuna göre karar verilmeli

Diabetes Care 2022;45 (Suppl. 1):S46–S59

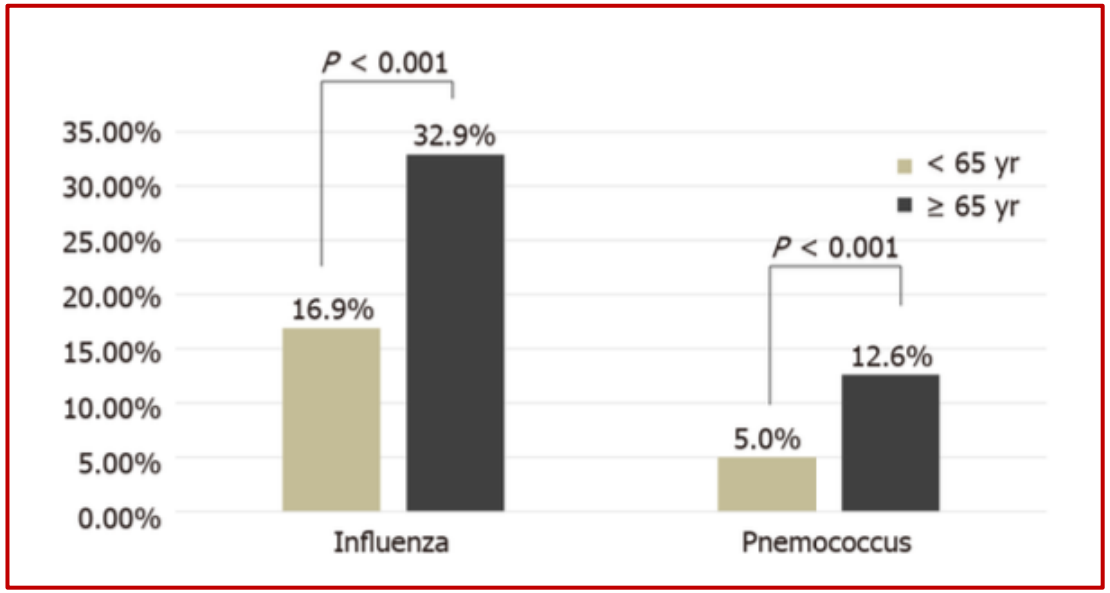
Diyabet hastalarında Herpes Zoster aşılaması

- Diyabetes mellitusta artmış zona enfeksiyonu riski
- Bazı kılavuzlarda
  - 50 yaş ve üzeri diyabetli bireylere
  - 2-6 ay ara ile
  - 2 doz rekombinant herpes zoster aşısı

TEMD, Diabetes Mellitus ve Komplikasyonlarının Tanı, Tedavi ve İzlem Kılavuzu-2022
Standards of Medical Care in Diabetes—2022. Diabetes Care 2022;45 (Suppl. 1):S46–S59

Ükemizde durum nasıl?

- TEMD Çalışması
- 37 şehir, 68 merkez
- 4721 Tip 2 DM hastası



World Journal of Diabetes

Submit a Manuscript: https://www.f6publishing.com

World J Diabetes 2021 December 15; 12(12): 2107-2118

DOI: 10.4239/wjd.v12.i12.2107

ISSN 1948-9358 (online)

ORIGINAL ARTICLE

Observational Study

Rates and associates of influenza and pneumococcus vaccination in diabetes mellitus: A nationwide cross-sectional study (TEMD vaccination study)

Ibrahim Demirci, Cem Haymana, Serpil Salman, Ilker Tasci, Demet Corapcioglu, Ali Kirik, İlhan Yetkin, Mustafa Altay, Tevfik Sabuncu, Fahri Bayram, Ilhan Satman, Alper Sonmez, TEMD Study Group

Sağlık Bakanlığı Türkiye İlaç ve Tıbbi Cihaz Kurumu Institutional Review Board 93189304-514.11.01 E.58933.

Informed consent statement: All study participants, or their legal guardian, provided informed written consent prior to study enrollment.

Conflict-of-interest statement: There is no conflict of interest.

Data sharing statement: No additional data are available.

STROBE statement: The authors have read the STROBE Statement-checklist of items, and the manuscript was prepared and revised according to the STROBE Statement-checklist of items.

Country/Territory of origin: Turkey

Specialty type: Endocrinology and metabolism

Provenance and peer review: Invited article; Externally peer reviewed

Peer-review model: Single blind

Abstract

BACKGROUND

Vaccination against influenza and pneumococcus is effective in reducing morbidity and mortality in patients with diabetes.

AIM

To investigate the prevalence of influenza and pneumococcal vaccinations and to search for the independent associates of vaccination in Turkish patients with diabetes.

METHODS

In this cross-sectional, nationwide, multicenter study, adult patients with type 1 diabetes (T1DM) (n = 454) and type 2 diabetes (T2DM) (n = 4721), who were under follow-up for at least a year in the outpatient clinics, were consecutively enrolled. Sociodemographic, clinical, and laboratory parameters of patients were recorded. Vaccination histories were documented according to the self-statements of the patients.

RESULTS

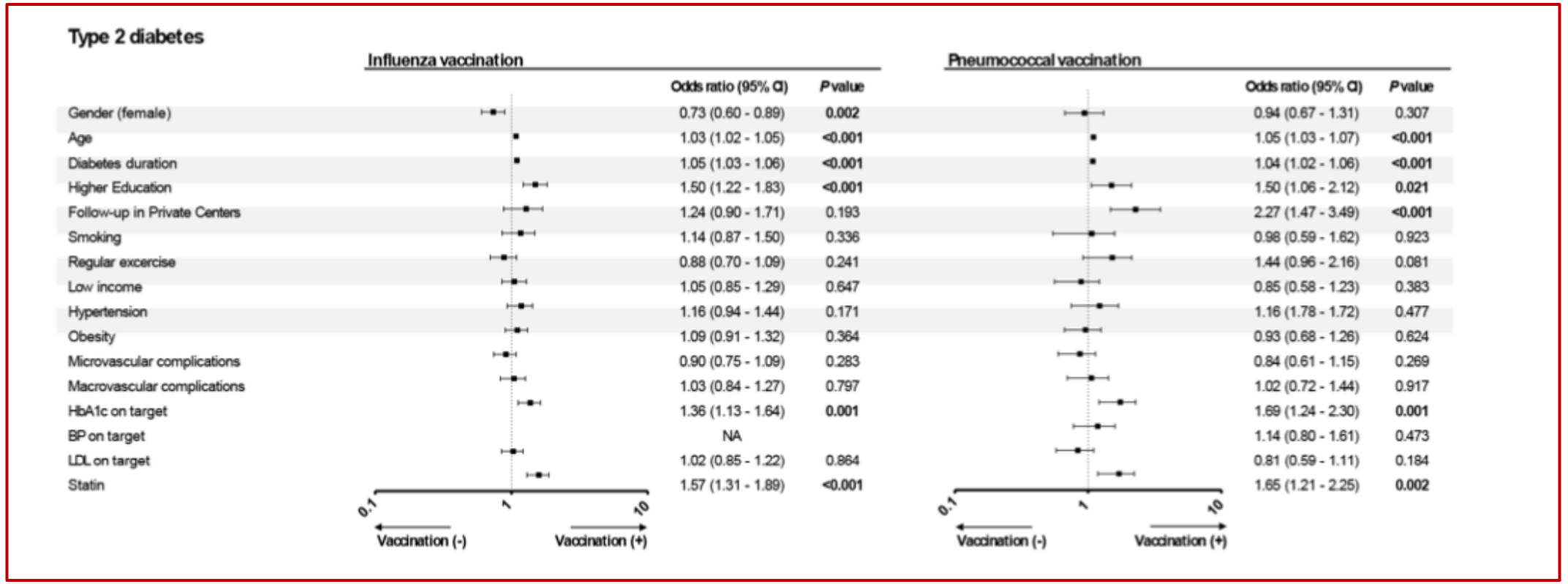
Patients with T1DM and T2DM had similar vaccination rates for influenza (23.6% *vs* 21.2%; P = 0.240) and pneumococcus (8% *vs* 7%; P = 0.451) vaccinations. Longer diabetes duration and older age were the common independent associates of having vaccination for both types of diabetes patients. Higher education level, using statin treatment, and having optimal hemoglobin A1c levels were the common independent associates of influenza and pneumococcal vaccination in patients with T2DM.

CONCLUSION

TEMD Vaccination Study shows that patients with T1DM and T2DM had very low influenza and pneumococcal vaccination rates in Turkey. The lower rates of vaccination in certain populations urges the necessity of nationwide vaccination strategies targeting these populations.

World J Diabetes. 2021 Dec 15;12(12):2107-2118

Ükemizde durum nasıl?

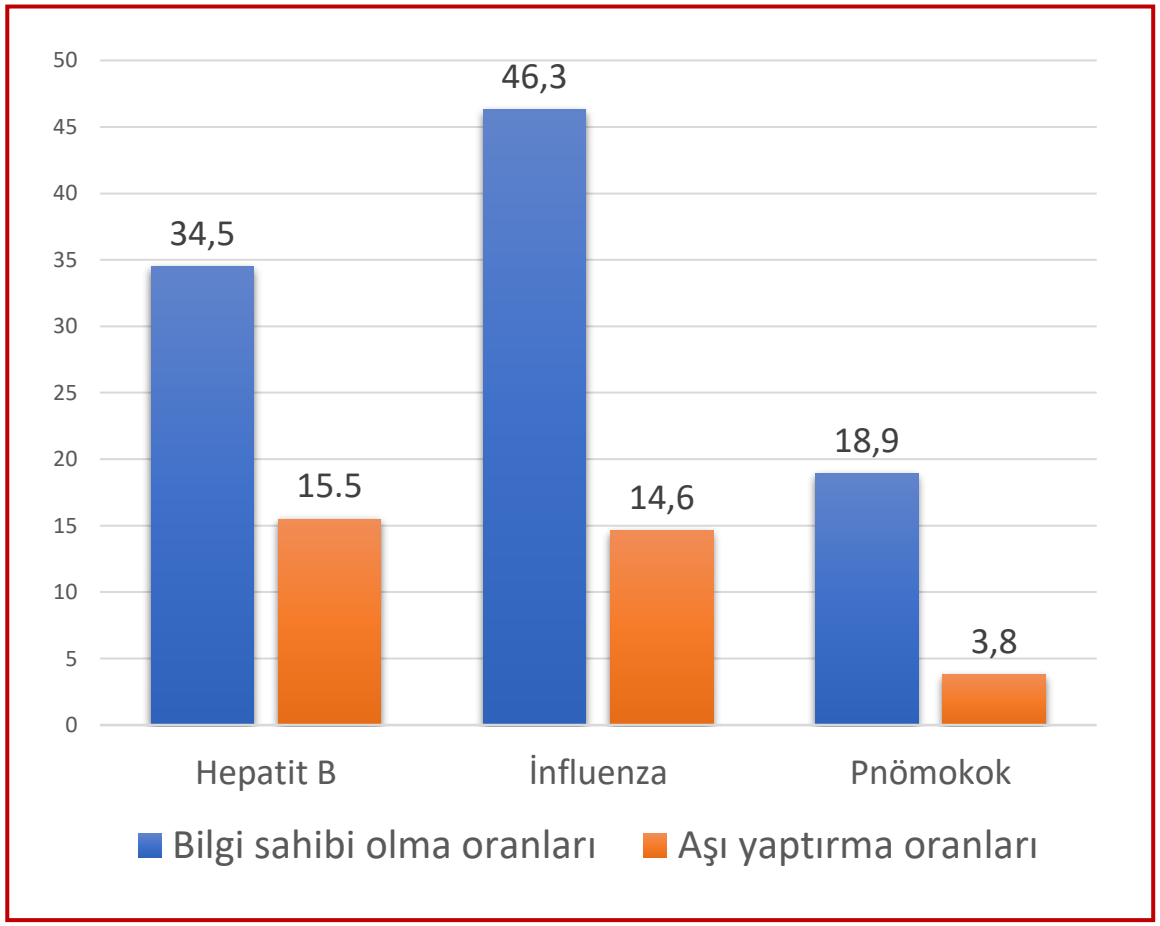


Kadın olmak
Yaş
Diyabet süresi
Eğitim düzeyi
Optimal HbA1c
Statin kullanmak

Yaş
Diyabet süresi
Eğitim düzeyi
Özel merkezlerde takip edilmek
Optimal HbA1c
Statin kullanmak

World J Diabetes. 2021 Dec 15;12(12):2107-2118

Ülkemizde durum nasıl?



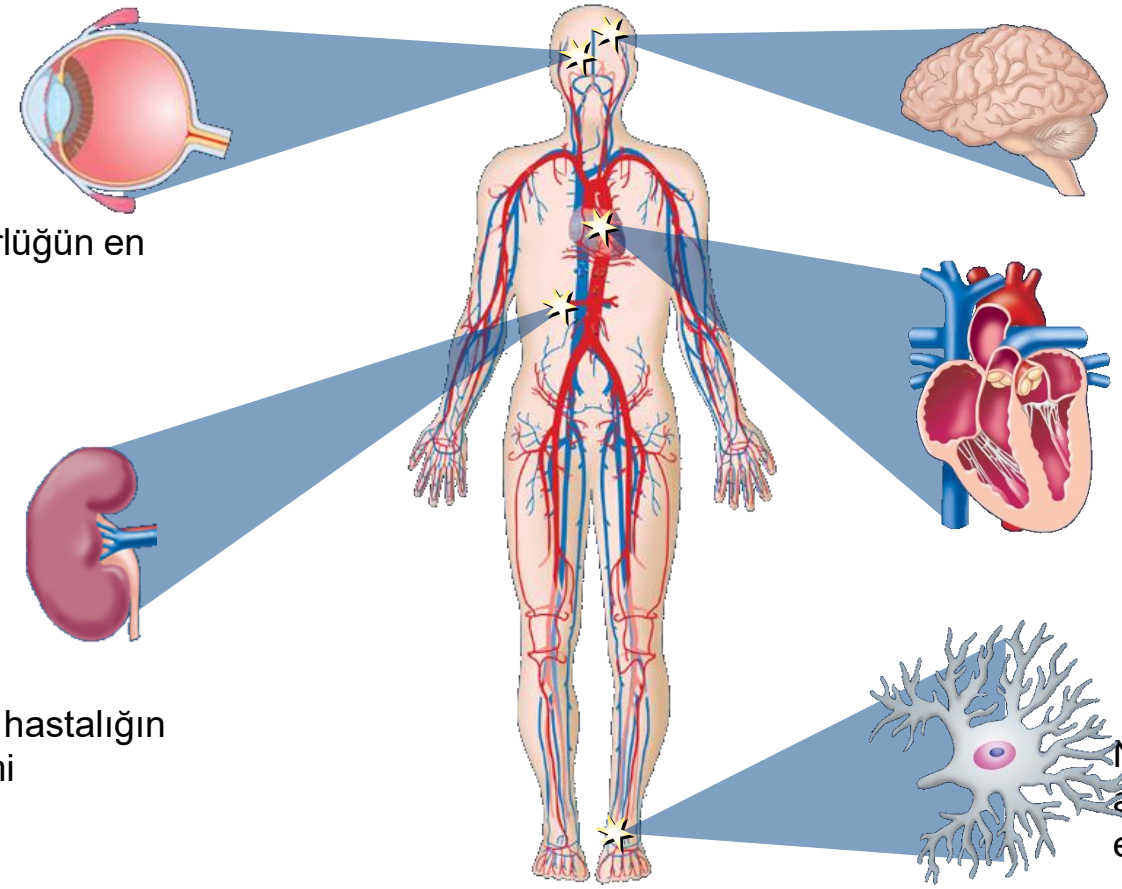
Gazi Medical Journal, 2016; 27: 115-117

Bitirirken…

- Diyabet günümüzde adeta bir salgın hastalık gibi yayılmaktadır.
  - Koruyucu hekimlik önem kazanmaktadır.
- Diyabetli bireylerde enfeksiyon sıklığı belirgin olarak daha fazladır.
- İnfluenza, Pnömokok ve Hepatit B aşıları tüm diyabet hastalarına önerilen primer aşılardır.
- Ülkemizdeki diyabetli bireylerde ne yazık ki hem aşı farkındalığı hem de aşı yaptırma oranı oldukça düşüktür.

Teşekkür ederim…

Diyabet önemli komplikasyonlara neden olur…



Diyabetik Retinopati

Erişkinlerde körlüğün en önemli nedeni

İnme

KV mortalite ve strok riski 2-4 kat artmıştır

Kardiovasküler Hastalık

Diyabetli 8/10 kişi KV olaylardan ölür

Diyabetik Nefropati

End-stage renal hastalığın en önemli nedeni

Diyabetik Nöropati

Non-travmatik alt ekstremite amputasyonlarına yol açan en önemli neden

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