Acinetobacter İnfeksiyonlarının Kontrolünde Umut Işığı Var mı?

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Bilim Akademisi, İstanbul
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The NEW ENGLAND JOURNAL of MEDICINE

REVIEW ARTICLE

CURRENT CONCEPTS

Acinetobacter Infection

L. Silvia Munoz-Price, M.D., and Robert A. Weinstein, M.D.

Karbapenem direnci	1995	%9
	2004	%40

Klinik Önem

A. baumannii, A. calcoaceticus, A. lwoffii

A.calcoaceticus–A. baumannii complex

NEJM 2008;358:1271-82

Journal of Hospital Infection 98 (2018) 260–263

Available online at www.sciencedirect.com

Journal of Hospital Infection

journal homepage: www.elsevier.com/locate/jhin

Rapid emergence of colistin resistance and its impact on fatality among healthcare-associated infections

M. Aydın [a,*], Ö. Ergönül [b], A. Azap [c], H. Bilgin [d], G. Aydın [c,e], S.A. Çavuş [f], Y.Z. Demiroğlu [g], H.E. Alışkan [h], O. Memikoğlu [c], Ş. Menekşe [i], Ş. Kaya [j], N.A. Demir [k], İ. Karaoğlan [l], S. Başaran [m], Ç. Hatipoğlu [n], Ş. Erdinç [n], E. Yılmaz [o], A. Tümtürk [p], Y. Tezer [p], H. Demirkaya [q], Ş.E. Çakar [r], Ş. Keske [b], S. Tekin [b], C. Yardımcı [s], Ç. Karakoç [t], P. Ergen [u], Ö. Azap [q], L. Mülazımoğlu [d], O. Ural [k], F. Can [v], H. Akalın [o], Turkish Society of Clinical Microbiology and Infectious Diseases, Healthcare-related Infections Study Group, Turkey

- **2014,2015 ((*J Hosp Infect* 2018)**
- **20 centers**
- **1556 HAI GN-BSI**
- **Fatality %42**

Antibiotic resistance rates in 1556 episodes of healthcare-associated Gram-negative bacteraemia

Species	*N* (%) of isolates that were resistant to:				
	Carbapenems	Fluoroquinolones	Third-generation cephalosporins	Aminoglycosides	Colistin
Acinetobacter baumannii *N* = 437	401 (91.8)	389 (89.0)	410 (93.8)	310 (70.9)	9 (2.1)
Klebsiella pneumoniae *N* = 416	216 (51.9)	266 (63.9)	320 (76.9)	200 (48.1)	67 (16.1)
Escherichia coli *N* = 339	34 (10.0)	189 (55.8)	203 (59.9)	103 (30.4)	3 (0.9)
Pseudomonas aeruginosa *N* = 205	88 (42.9)	102 (49.8)	103 (50.2)	65 (31.7)	18 (8.8)
Enterobacter cloacae *N* = 159	37 (23.3)	46 (28.9)	59 (37.1)	51 (32.1)	9 (5.7)

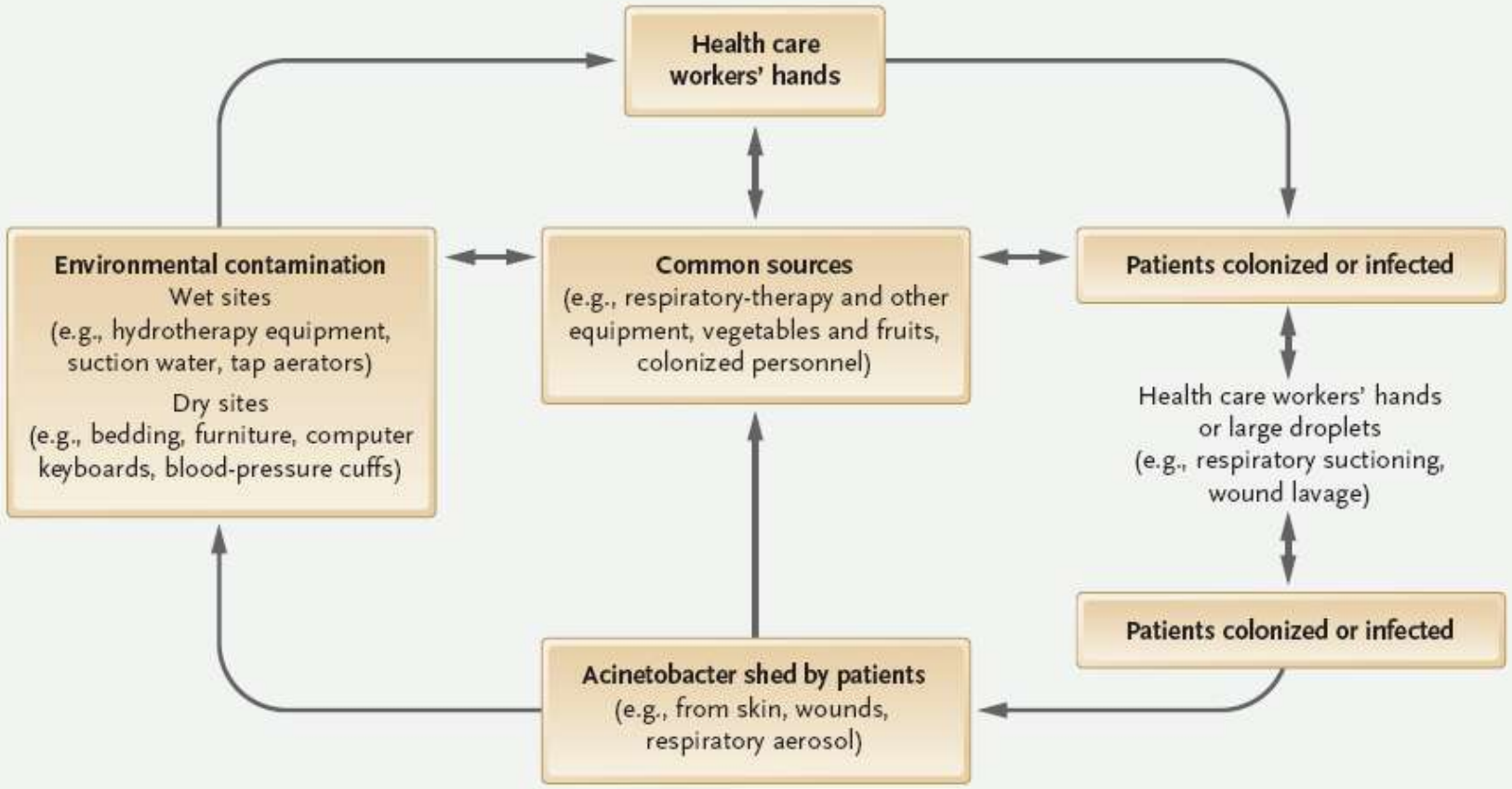

Figure 3. Reservoirs, Sources, and Transmission Patterns for Acinetobacter in Health Care Facilities.

Infection-control measures are directed against the major epidemiologic modes of transmission of acinetobacter, as determined mostly from outbreaks: common-source contamination, environmental contamination, and cross-infection due to lapses in hand hygiene.[22] Although environmental contamination is well documented as a cause of epidemic infections, there are fewer examples of environmental contribution to endemic acinetobacter.

Table II *Distribution of the cultures from environmental samplings and the bacteria isolated*

Site of the sampling	Number	Number of A.b.	Other	No growth
Bed	9	6	3(2 En,1m)	—
Table	9	3	2(2m)	4
Dresser	5	1	4(1En,1m,2P)	—
Infusion pump	6	3	2(2En)	1
Pulseoxymeter	6	4	2(2m)	—
ECG probe	8	—	1(1E)	7
B.P. cuff	5	3	2(1E,1m)	—
Nebulizer	4	—	—	4
Cupboard	2	1	1(m)	—
Service desk	2	1	1(P)	—
Total	56	22	18	16

A.b., *Acinetobacter baumannii*; En, Enterobacteriaceae; P, *Pseudomonas*; m, mixed flora (*Staphylococcus* spp. diphtheroid bacillus, candida, other); B.P., blood pressure.

Aygün G. J Hosp Inf 2002

TABLE 2. Rates of colonization of various body sites of patients and controls with *Acinetobacter* spp.

Body site	No. (%) of patients or controls colonized with *Acinetobacter* spp.		
	Patients	Controls	Both groups
Forehead	13 (33)	5 (13)	18 (23)
Ear	14 (35)	3 (8)	17 (21)
Nose	13 (33)	3 (8)	16 (20)
Throat	6 (15)	0 (0)	6 (8)
Axilla	13 (33)	1 (3)	14 (18)
Hand	13 (33)	8 (20)	21 (26)
Groin	15 (38)	5 (13)	20 (25)
Perineum	8 (20)	1 (3)	9 (11)
Toe web	16 (40)	3 (8)	19 (24)
Total no. (%) of sites colonized	111 (31)	29 (8)	140 (19)

Seifert H.1997 JCM

TABLE 1. Sensitivities of surveillance cultures from different body sites among patients with recent clinical culture of MDR *A. baumannii* (≤10 days)

Culture site	No. of patients sampled	No. with MDR *A. baumannii*	Sensitivity (%)
Surveillance sites			
Nostrils	22	4	18
Pharynx	22	5	23
Skin	22	3	13.5
Rectum	21	3	14
Clinical sites			
Wounds[a]	9	2	22
Endotracheal aspirates[b]	7	2	29

[a] Only discharging wounds were cultured.
[b] Endotracheal aspirates were obtained only from intubated patients.

Marchaim-Carmeli 2007
JCM

Epidemiological investigation after hospitalising a case with pandrug-resistant *Acinetobacter baumannii* infection

Y.-Y. Chuang [a], Y.-C. Huang [a,b,*], C.-H. Lin [a], L.-H. Su [b,c], C.-T. Wu [a]

[a] *Departments of Pediatrics, Chang Gung Children's Hospital and Chang Gung Memorial Hospital, Kweishan, Taoyuan, Taiwan*
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[c] *Department of Clinical Pathology, Chang Gung Memorial Hospital, Kweishan, Taoyuan, Taiwan*

Tarama Sonrası *Acinetobacter baumannii* Saptanma Oranları

Table I Distribution of specimens obtained and positive results for *A. baumannii* and pandrug-resistant *A. baumannii* (PDRAB) in Hospital A and B

Hospital	No. of specimens	*A. baumannii* (+) No. (%)	PDRAB (+) No. (%)
A	84	13 (15.5)	6 (7.1)
Patients ($N = 7$)	10	8 (80)	5[a] (50)
Patient-related equipment	63	4 (6.3)	1 (1.6)
Environmental objects	11	1 (9.1)	0
B	128	23 (18.0)	5 (3.9)
Patients ($N = 23$)	44	14 (31.8)	4[b] (9.1)
Patient-related equipment	67	7 (10.4)	1 (1.5)
Environmental objects	17	2 (11.8)	0
Total	212	36 (17)	11 (5.2)

[a] From two patients (four from index case).
[b] From three patients.

Yayılımın İzlenmesi

Table IV Distribution of 11 pandrug-resistant *A. baumannii* (PDRAB) in four patients, and their related equipment

Case no.	No. of isolates	Hospital	Site isolated	PFGE patterns
Index case	5	A[a]	Nose	II
		A[a]	Throat	II
		A[a]	Sputum	II
		A[a]	Rectum	II
		A[a]	Ambu bag	I
2	2	A[a]	Sputum	II
		B	Sputum	I
3	2	B	Nose	I
		B	Ventilator monitor	II
4	2	B	Nose	III
		B	Sputum	III

PFGE, pulsed-field gel electrophoresis.
All 11 PDRAB isolates belonged to the same infrequent restriction site—polymerase chain reaction genotype.
[a] Both cases were transferred from Hospital B.

Chuang YY, et al. J Hosp Infect 2009

Prevalans Anketlerinin Tasarım Sorunları

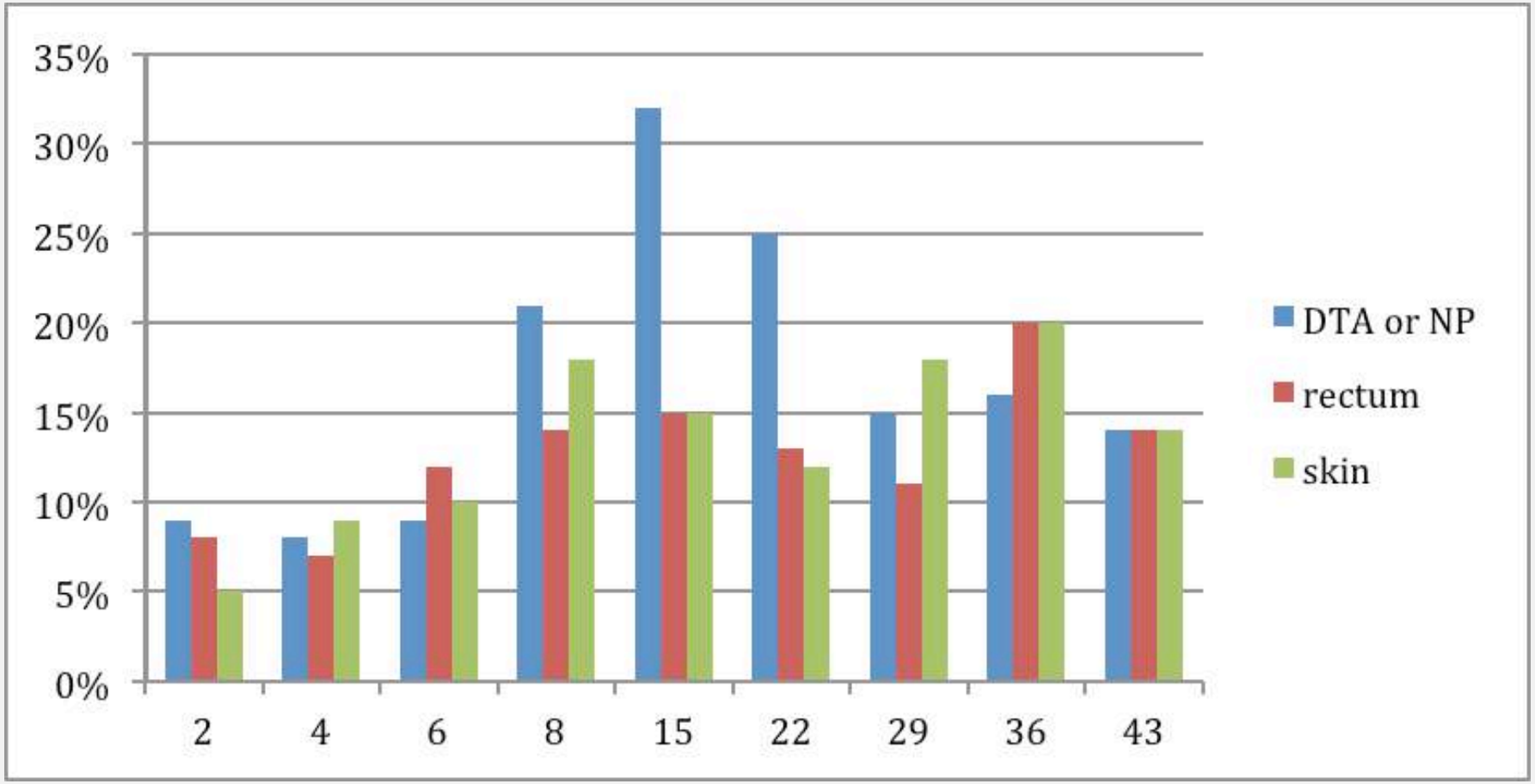
Tasarım bileşeni	Sorunlar
Hastane	Hastane örnekleri ülkeyi temsil edebilmelidir
Servis	Olguların karıştırıclığı (case mix) yüksek ve düşük riskli bölgeleri kapsamalıdır
Araştırmacı	Hastane enfeksiyonları enfeksiyonları tanımları üzerinde bilgili olmalı
Veri toplama	Amaçlara ve pratik imkanlara göre değişebilir
Enfeksiyon yeri	Sadece seçilmiş yerler dahil edilmektedir, oysa tüm enfeksiyon yerleri ele alınmalıdır
Değerlendirme çalışmaları	Pek az çalışmada validasyon yapılmış, oysa çalışmanın güvenilirliğini artıran bir faktrödür

Clin Infect Dis 2009

Kolonizasyon Oranları

	Number of samples obtained	Acinetobacter baumannii isolation; n (%)
Bodies of the patients		
Deep tracheal aspirate or Nasopharynx	1271	158 (%12)
Rectum	1271	129 (%10)
Skin (by pooling from axillary, antecubital and inguinal regions)	1271	125 (%10)
Close inanimate environment of the patients		
Bed (by pooling from the head, foot and center of the bed)	1271	66 (%5)
Patient table	1271	23 (%2)
Buttons of respiratory pumps	1271	5 (0.4)
enviromental	260	1 telephone 2 keyboards of computer
Hands of Health care Workers	1200	15 (%1)
Total	7815	

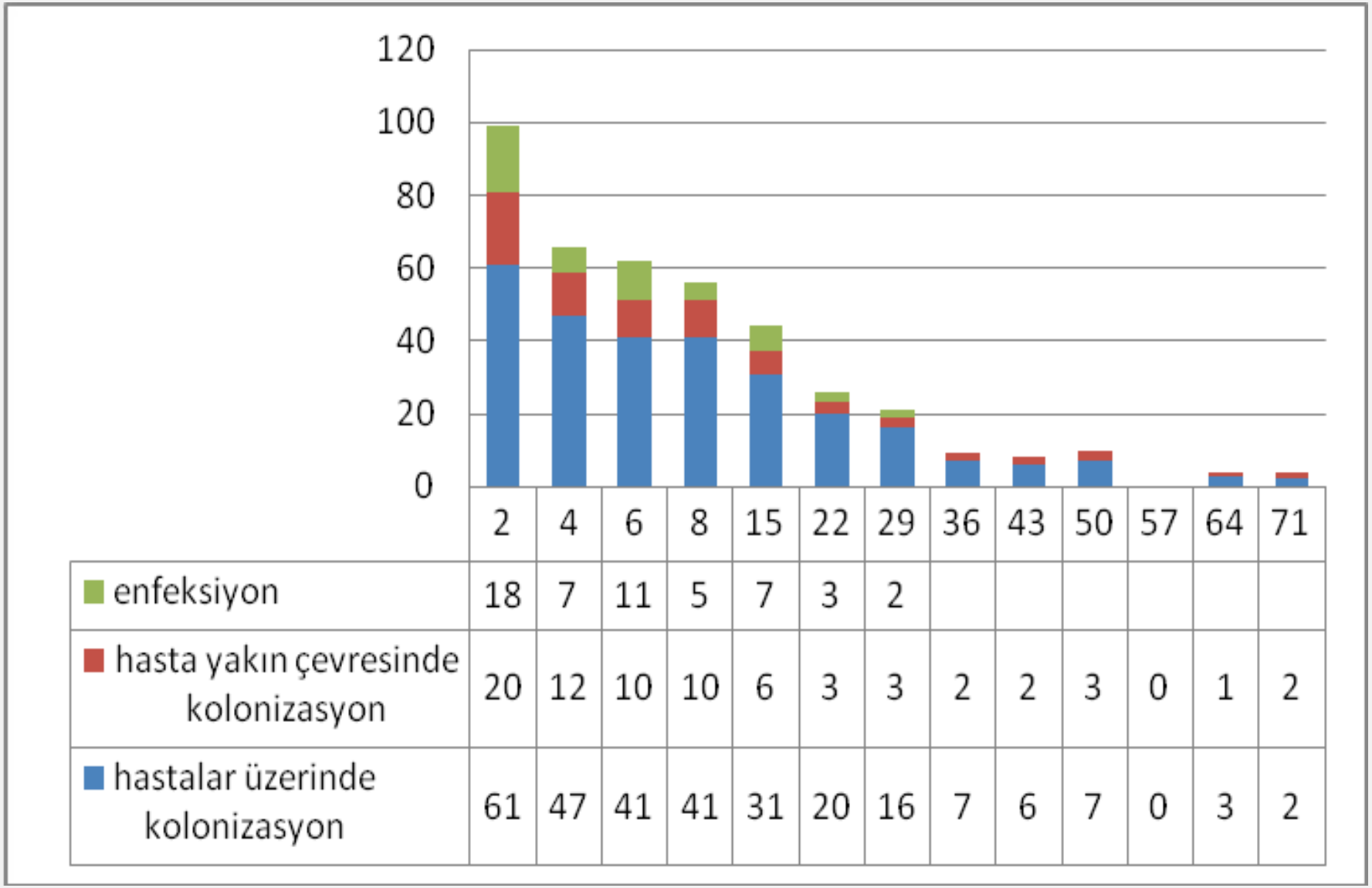
Ergönül Ö. TUBITAK projesi



The proportion of the colonization on the bodies of the patients during their stay in ICU, X axis depicts the days in ICU, Y axis depicts the percentage of colonization. DTA; Deep tracheal aspirate, NP; nasophayrnx.

Ergönül Ö. TUBITAK projesi

Kolonizasyon ve İnfeksiyon İlişkisi



	2	4	6	8	15	22	29	36	43	50	57	64	71
enfeksiyon	18	7	11	5	7	3	2						
hasta yakın çevresinde kolonizasyon	20	12	10	10	6	3	3	2	2	3	0	1	2
hastalar üzerinde kolonizasyon	61	47	41	41	31	20	16	7	6	7	0	3	2

Ergönül Ö. TUBITAK projesi

The NEW ENGLAND JOURNAL of MEDICINE

ORIGINAL ARTICLE

Decontamination of the Digestive Tract and Oropharynx in ICU Patients

A.M.G.A. de Smet, M.D., J.A.J.W. Kluytmans, M.D., Ph.D., B.S. Cooper, Ph.D., E.M. Mascini, M.D., Ph.D., R.F.J. Benus, M.D., T.S. van der Werf, M.D., Ph.D., J.G. van der Hoeven, M.D., Ph.D., P. Pickkers, M.D., Ph.D., D. Bogaers-Hofman, I.C.P., N.J.M. van der Meer, M.D., Ph.D., A.T. Bernards, M.D., Ph.D., E.J. Kuijper, M.D., Ph.D., J.C.A. Joore, M.D., M.A. Leverstein-van Hall, M.D., Ph.D., A.J.G.H. Bindels, M.D., Ph.D., A.R. Jansz, M.D., R.M.J. Wesselink, M.D., Ph.D., B.M. de Jongh, M.D., Ph.D., P.J.W. Dennesen, M.D., Ph.D., G.J. van Asselt, M.D., Ph.D., L.F. te Velde, M.D., I.H.M.E. Frenay, M.D., Ph.D., K. Kaasjager, M.D., Ph.D., F.H. Bosch, M.D., Ph.D., M. van Iterson, M.D., S.F.T. Thijsen, M.D., Ph.D., G.H. Kluge, M.D., Ph.D., W. Pauw, M.D., J.W. de Vries, M.D., Ph.D., J.A. Kaan, M.D., J.P. Arends, M.D., L.P.H.J. Aarts, M.D., Ph.D., P.D.J. Sturm, M.D., Ph.D., H.I.J. Harinck, M.D., Ph.D., A. Voss, M.D., Ph.D., E.V. Uijtendaal, Pharm.D., H.E.M. Blok, M.Sc., E.S. Thieme Groen, M.D., M.E. Pouw, M.D., C.J. Kalkman, M.D., Ph.D., and M.J.M. Bonten, M.D., Ph.D.

NEJM 2009

Sindirim Sistemi ve Orofarenksin Dekontaminasyonu

13 YB ünitesi, Hollanda, çaprazlama

1. Sistemik dekontaminasyon (SDD)

    4 gün iv sefotaksim + topikal abx (tobra, kolistin, amfoB)

2. Orofarenksin dekontaminasyonu (SOD)

    topikal abx

3. Standart bakım (SB)

6 ay boyunca

28. günde ölüm primer son nokta

Smet et al. Decontamination of the Digestive Tract and Oropharynx in ICU Patients. NEJM 2009

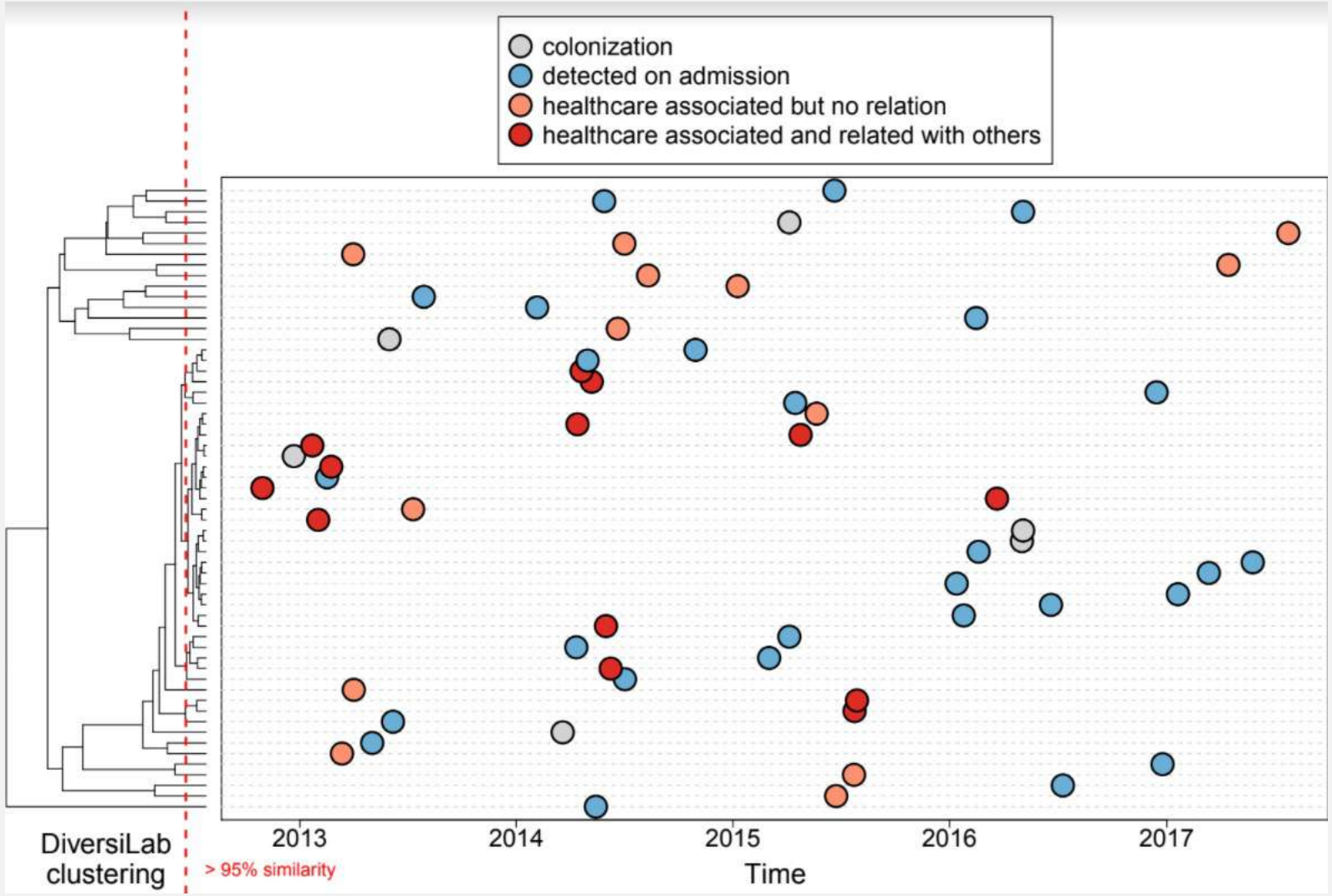
Sindirim Sistemi ve Orofarenksin Dekontaminasyonu

5939 hasta	28. günde kaba ölüm oranı	Odds oranı
1990 SB,	%27.5	
1904 SOD	%26.6	0.86 (0.74-0.99)
2045 SDD	%26.9	0.83 (0.72-0.97)

SOD	%2.9 azalma
SDD	%3.5 azalma

Smet et al. Decontamination of the Digestive Tract and Oropharynx in ICU Patients. NEJM 2009

Sağlık Bakımıyla İlişkili Acinetobacter baumannii infeksiyonlarının Eliminasyonu



Ekim 2012-Ekim 2017: 5 yıl

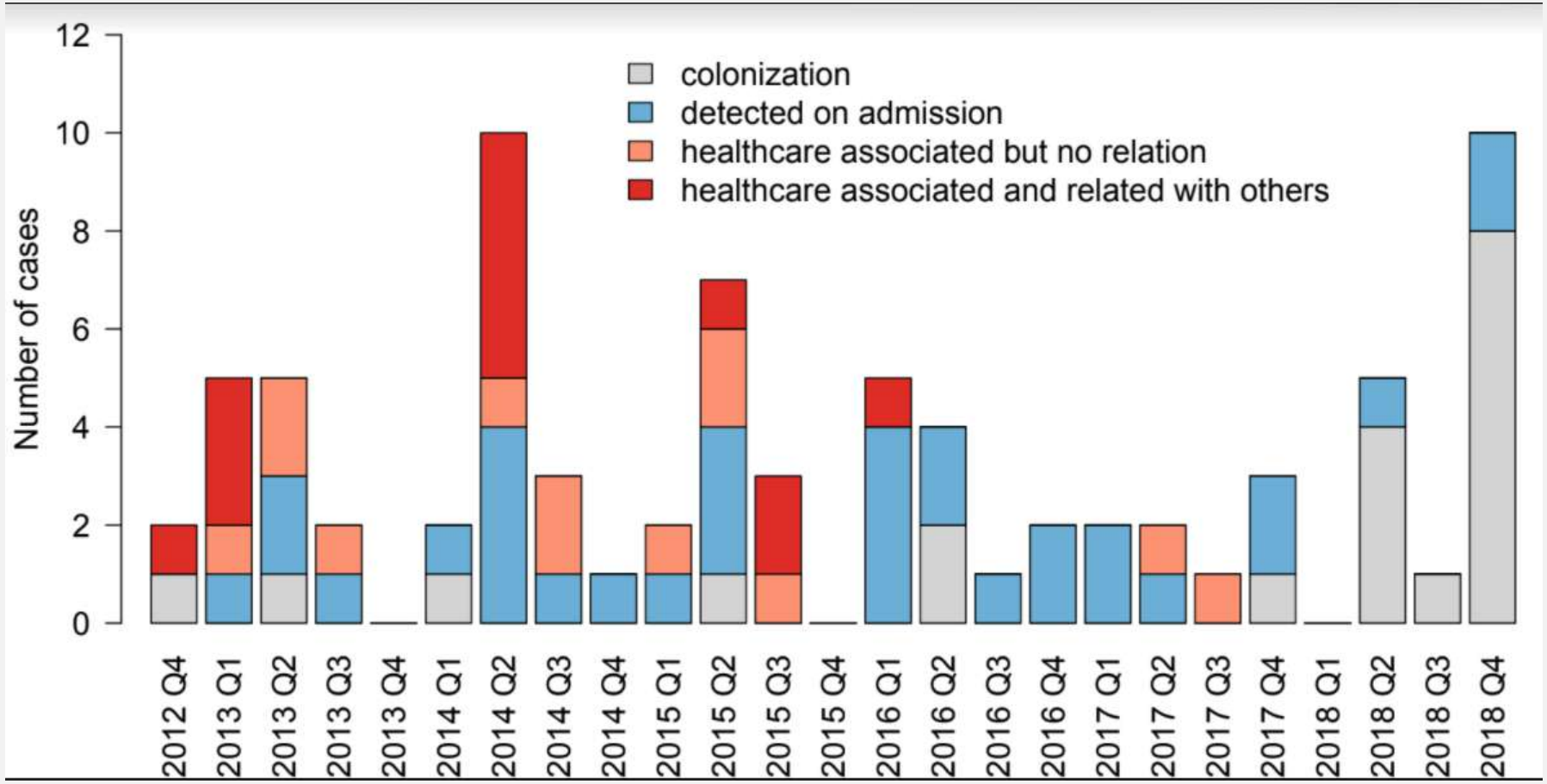
59 olgu

Ergonul O, Tokca G, Keske Ş, Donmez E, Madran B, Kömür A, Gönen M, Can F.

Elimination of healthcare-associated Acinetobacter baumannii infection in a highly endemic region.

Int J Infect Dis. 2022 Jan;114:11-14.

Quarterly distribution of isolates



Ergonul O, Tokca G, Keske Ş, Donmez E, Madran B, Kömür A, Gönen M, Can F. Elimination of healthcare-associated Acinetobacter baumannii infection in a highly endemic region. Int J Infect Dis. 2022 Jan;114:11-14.

Clinical Microbiology and Infection 25 (2019) 688–695

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journal homepage: www.clinicalmicrobiologyandinfection.com

Narrative review

How to: molecular investigation of a hospital outbreak

A. Nutman [1,2], D. Marchaim [2,3,*]

[1] National Center for Infection Control, Tel-Aviv Sourasky Medical Center, Israel
[2] Sackler School of Medicine, Tel-Aviv University, Tel-Aviv, Israel
[3] Unit of Infection Control, Assaf Harofeh Medical Center, Zerifin, Israel

Salgin suphelerinde salgin kaynagini saptayabilmek ve bulasi haritalandirabilmek icin PFGE ve rep-PCR metodlari kullanilabilir.

sitions [49]. In case of an abrupt outbreak, in a unit with low background endemicity, PFGE or rep-PCR might still be used in order to tailor the appropriate preventive intervention (while coupled with quantification of transmission opportunities [1]). As a concept, the transmission dynamics of *A. baumannii* in many ICUs is so complex that both modes of acquisitions (i.e. patient-to-patient transmission, emergence of resistance) should be tackled concurrently [5].

pathogens

MDPI

Review

Acinetobacter baumannii Infections in Times of COVID-19 Pandemic

Karyne Rangel [1,*], Thiago Pavoni Gomes Chagas [2] and Salvatore Giovanni De-Simone [1,3,*]

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2 Department of Pathology, Medical School, Federal Fluminense University, Niterói 24220-008, Brazil; thiago@id.uff.br
3 Department of Molecular and Cellular Biology, Biology Institute, Federal Fluminense University, Niterói 24220-008, Brazil
* Correspondence: karyne.rangel@cdts.fiocruz.br (K.R.); dsimone@cdts.fiocruz.br (S.G.D.-S.); Tel.: +55-213865-8240 (K.R. & S.G.D.-S.)

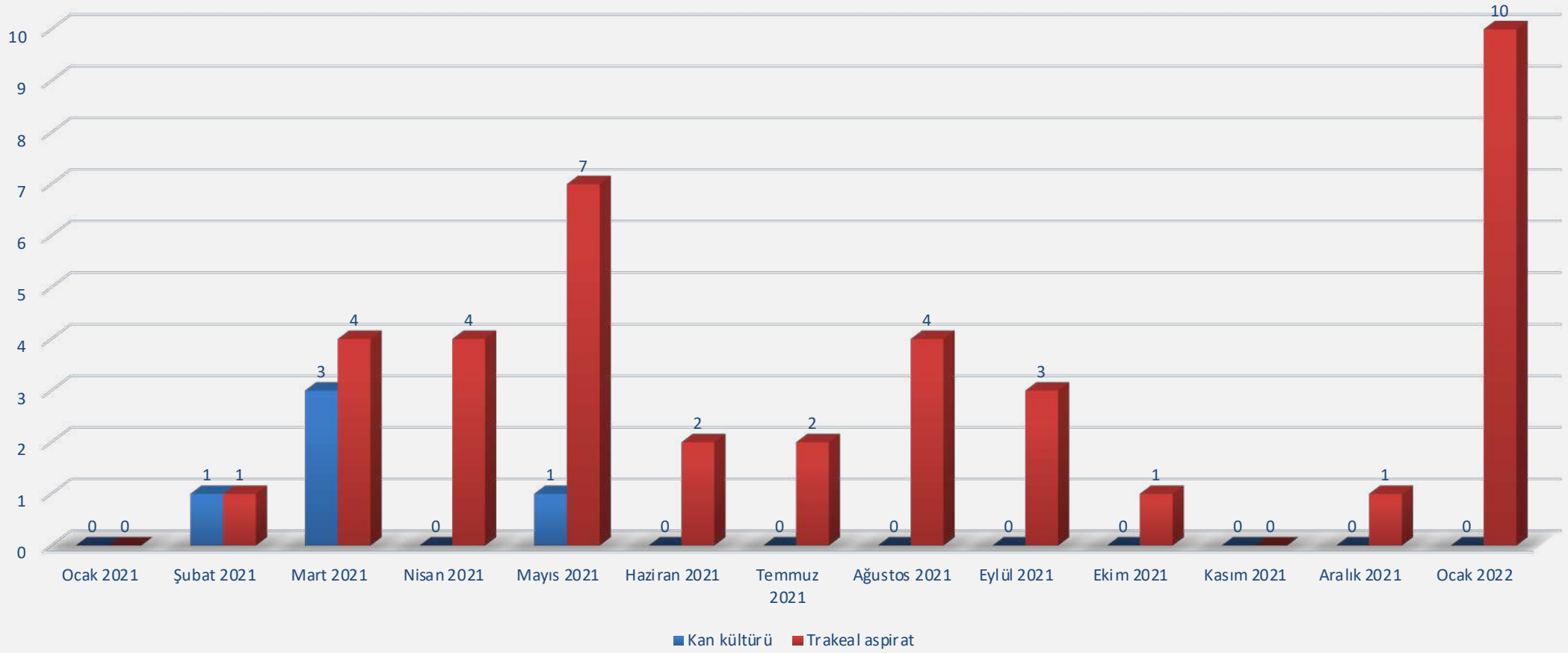
- *A.baumannii* ve Covid-19 koenfeksiyonunun farkli ulkelerdeki hastaneler tarafindan raporlanmasi

- Covid-19 ve Gram negatif koenfeksiyonlarinda *A.baumannii* dominasyonu

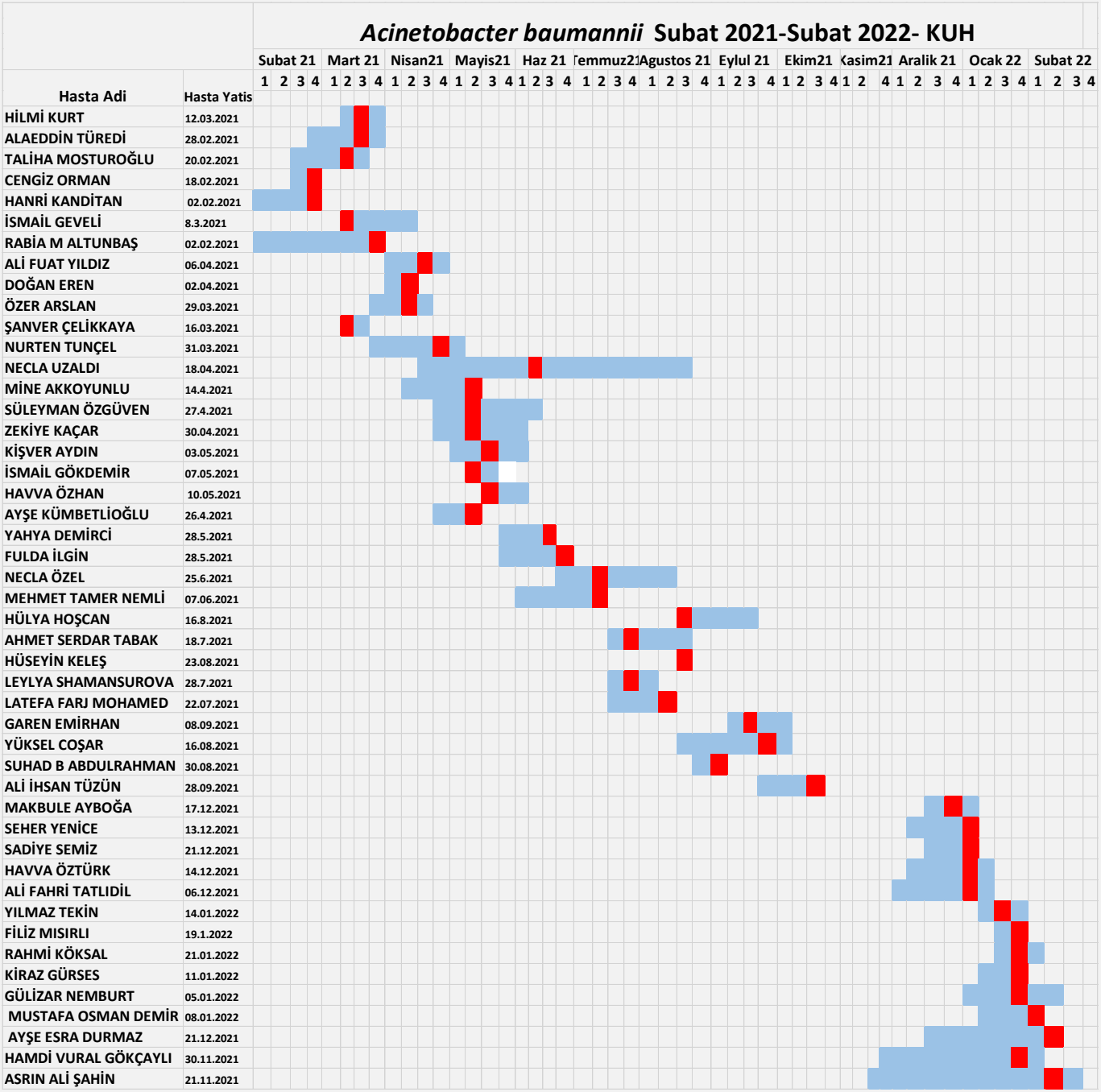
Table 1. Incidence of co- and secondary infection of *A. baumannii* during COVID-19 pandemic reported in various countries.

Country/City	COVID-19 Patients	*A. baumannii* Coinfection n (%)	Other Pathogenic Organisms Found	Reference
China/Wuhan	102	57 (35.8%)	*K. pneumoniae* (30.8%), *Stenotrophomonas maltophilia* (6.3%) and others	[8]
Iran/Qom	90	17 (90%)	*S. aureus* (10%)	[19]
China/Wuhan	221	5 (55.6%)	*Escherichia coli*, *P. aeruginosa*, and *Enterococcus* (data not shown)	[103]
Spain/Valladolid	712	25 (18.7%)	*E. faecium* (17.2%) and others	[106]
Brazil/Minas Gerais	212	21 (32.8%)	*Staphylococcus* spp. (45.3%), *Pseudomonas* spp. (32.8%), *Stenotrophomonas* spp. (14.06%), *Klebsiella* spp. (12.5%), *Enterobacter* spp. (9.4%), *Enterococcus* spp. (9.4%), *E. coli* (6%).	[108]
France/Argenteuil	92	1 (3%)	*S. aureus* (31%), *Haemophilus influenzae* (22%), *Streptococcus pneumoniae* (19%), *Enterobacteriaceae* (16%), *P. aeruginosa* (6%), *Moraxella catarrhalis* (3%)	[121]
Egypt/Alrajhrt	260	28 (16.6%)	*S. aureus* (11.9%), *S. pneumoniae* (4.7%), *E. faecalis* (2.3%), *K. pneumoniae* (28.5%), *E. coli* (9.5%), *P. aeruginosa* (9.5%), *Enterobacter cloacae* (4.7%)	[129]
Italy/Milan	731	7 (30.4%)	*S. aureus* (69.7%), *E. coli* (21.7%)	[118]
China/Wuhan	99	1 (1%)	*K. pneumoniae* (1%), *Aspergillus flavus* (1%)	[119]
China/Wuhan	69	1 (1.4%)	*Candida albicans* (2.8%), *E. cloacae* (2.8%)	[120]
China/Beijing	20	10 (20%)	*Stenotrophomonas maltophilia* (28%), *P. aeruginosa* (28%)	[122]
France/Paris	5	1 (20%)	*A. flavus* (20%)	[127]
Italy/Naples	32	4 (19%)	*K. pneumoniae* (32%), *P. aeruginosa* (14%), *E. cloacae* (9%), *S. aureus* (4%), *E. faecium* (9%), *S. maltophilia* (9%), *E. faecalis* (4%)	[128]
Italy/Ferrara	28	17 (13.6%)	*E. faecalis* (14.2%), *E. faecium* (8%), *S. epidermidis* (33.6%), *S. maltophilia* (10.4%), *C. albicans* (23.2%)	[130]
Taiwan/Tainan	18	2 (11.1%)	*Streptococcus dysgalactiae* (11.1%), Influenza virus B (5.55%)	[131]

Genel Yoğun Bakım Ünitesi Aylara Göre İzole Edilen *A.baumannii* Dağılımı



Acinetobacter baumannii Subat 2021-Subat 2022- KUH

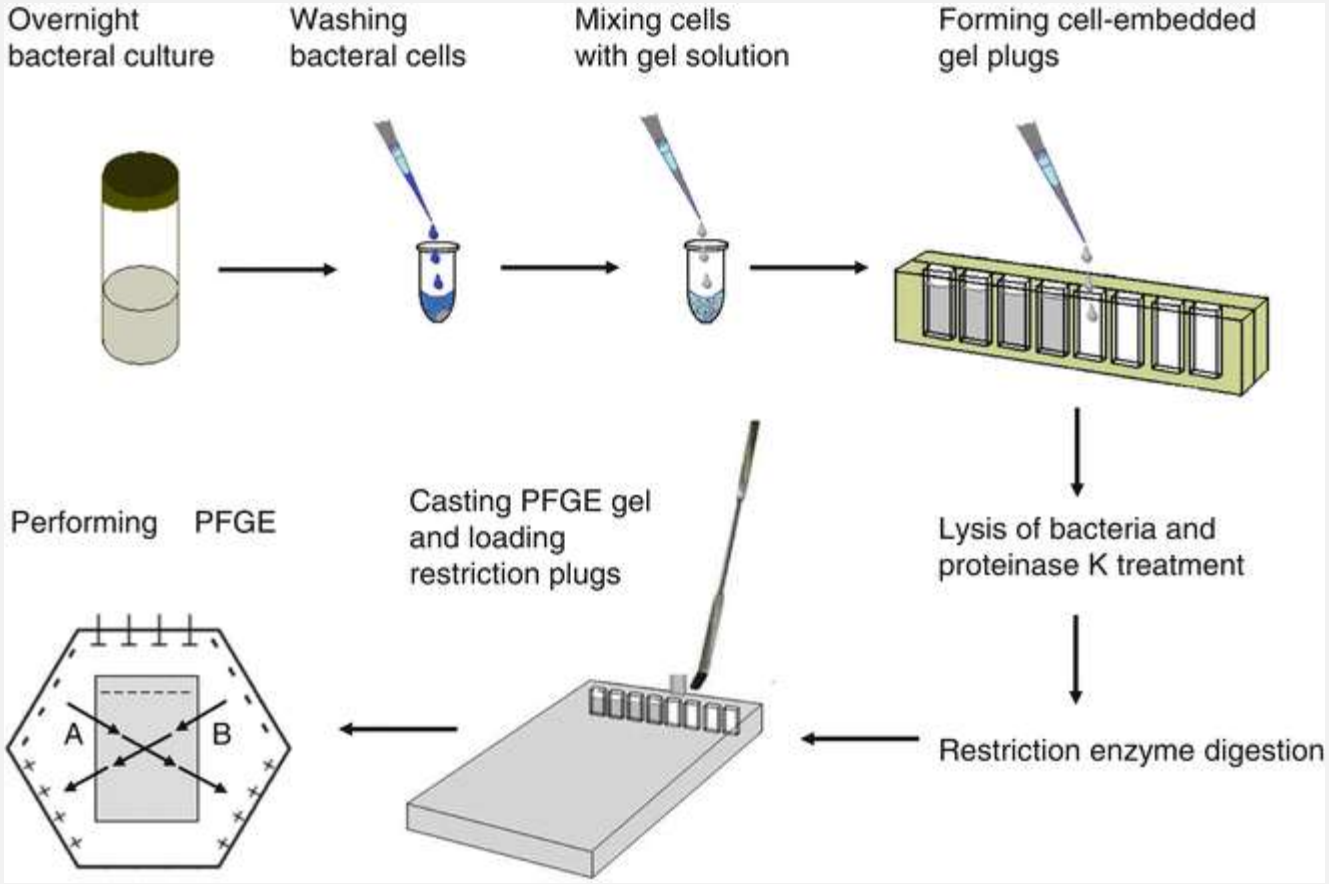


Hasta Adi	Hasta Yatis
HİLMİ KURT	12.03.2021
ALAEDDİN TÜREDİ	28.02.2021
TALİHA MOSTUROĞLU	20.02.2021
CENGİZ ORMAN	18.02.2021
HANRİ KANDİTAN	02.02.2021
İSMAİL GEVELİ	8.3.2021
RABİA M ALTUNBAŞ	02.02.2021
ALİ FUAT YILDIZ	06.04.2021
DOĞAN EREN	02.04.2021
ÖZER ARSLAN	29.03.2021
ŞANVER ÇELİKKAYA	16.03.2021
NURTEN TUNÇEL	31.03.2021
NECLA UZALDI	18.04.2021
MİNE AKKOYUNLU	14.4.2021
SÜLEYMAN ÖZGÜVEN	27.4.2021
ZEKİYE KAÇAR	30.04.2021
KİŞVER AYDIN	03.05.2021
İSMAİL GÖKDEMİR	07.05.2021
HAVVA ÖZHAN	10.05.2021
AYŞE KÜMBETLİOĞLU	26.4.2021
YAHYA DEMİRCİ	28.5.2021
FULDA İLGİN	28.5.2021
NECLA ÖZEL	25.6.2021
MEHMET TAMER NEMLİ	07.06.2021
HÜLYA HOŞCAN	16.8.2021
AHMET SERDAR TABAK	18.7.2021
HÜSEYİN KELEŞ	23.08.2021
LEYLYA SHAMANSUROVA	28.7.2021
LATEFA FARJ MOHAMED	22.07.2021
GAREN EMİRHAN	08.09.2021
YÜKSEL COŞAR	16.08.2021
SUHAD B ABDULRAHMAN	30.08.2021
ALİ İHSAN TÜZÜN	28.09.2021
MAKBULE AYBOĞA	17.12.2021
SEHER YENİCE	13.12.2021
SADİYE SEMİZ	21.12.2021
HAVVA ÖZTÜRK	14.12.2021
ALİ FAHRİ TATLIDİL	06.12.2021
YILMAZ TEKİN	14.01.2022
FİLİZ MISIRLI	19.1.2022
RAHMİ KÖKSAL	21.01.2022
KİRAZ GÜRSES	11.01.2022
GÜLİZAR NEMBURT	05.01.2022
MUSTAFA OSMAN DEMİR	08.01.2022
AYŞE ESRA DURMAZ	21.12.2021
HAMDİ VURAL GÖKÇAYLI	30.11.2021
ASRIN ALİ ŞAHİN	21.11.2021

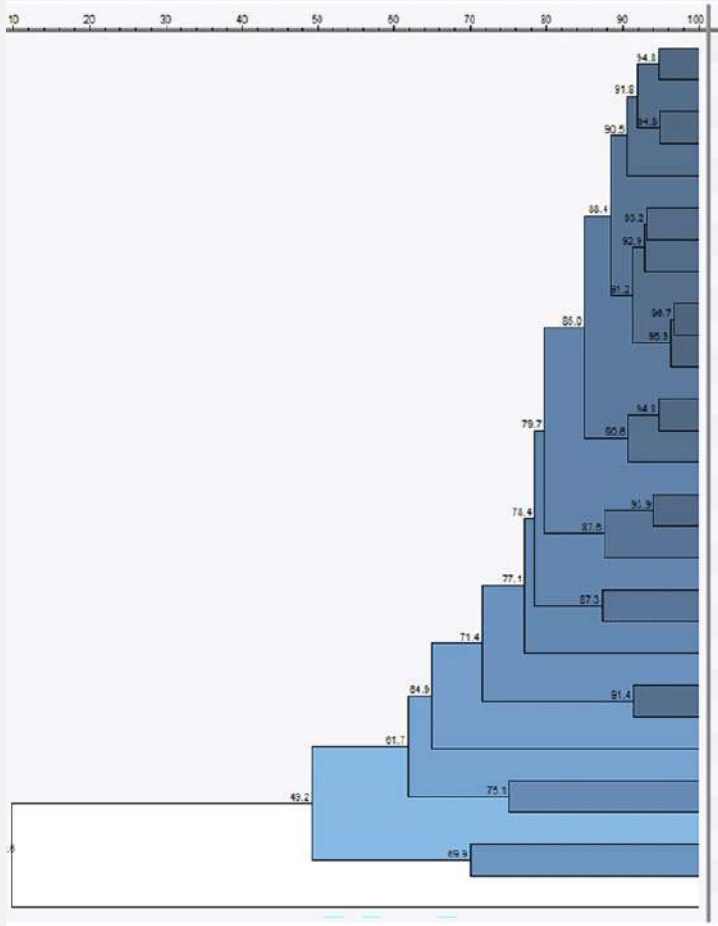
Hastanede yattığı günleri gösterir.

A.baumannii izole edilen kültürün alındığı tarihi ifade eder.

PFGE Protokolu



Acinetobacter baumannii İnfeksiyonları ve Pandemi



No.	Cluster	Isolation Date	Room No	COVID-19	IMP	AK	Col	CAZ	CIP	MEM	GN	TOB
1	A	10.01.2022	10	Negative	R	R	S	R	R	R	R	R
2	A	11.01.2022	15	Negative	R	R	S	R	R	R	R	R
3	A	19.05.2021	01	Positive	R	R	S	R	R	R	R	R
4	A	23.09.2021	01	Positive	R	R	S	R	R	R	R	R
5	A	17.04.2021	02	Positive	R	R	S	R	R	R	R	R
6	A	17.03.2021	06	Positive	R	R	S	R	R	R	R	R
7	A	05.01.2022	08	Positive	R	S	S	R	R	R	R	R
8	A	25.12.2021	04	Positive	R	R	S	R	R	R	R	R
9	A	28.01.2022	04	Negative	R	R	S	R	R	R	R	R
10	A	07.01.2022	02	Positive	R	R	S	R	R	R	R	R
11	A	05.01.2022	01	Positive	R	S	S	R	R	R	R	R
12	A	10.05.2021	08	Positive	R	R	S	R	R	R	R	R
13	A	09.03.2021	02	Positive	R	R	S	R	R	R	R	R
14	A	07.02.2022	10	Positive	R	R	S	R	R	R	R	R
15	B	07.09.2021	03	Positive	R	R	S	R	R	R	R	R
16	B	03.09.2021	02	Positive	R	R	S	R	R	R	S	R
17	B	08.05.2021	07	Positive	R	R	S	R	R	R	R	R
18	C	13.04.2021	01	Positive	R	R	S	R	R	R	R	R
19	C	08.05.2021	05	Positive	R	R	S	R	R	R	R	R
20	D	18.08.2021	02	Positive	R	R	S	R	R	R	S	R
21	E	30.04.2021	03	Positive	R	R	S	R	R	R	R	R
22	E	25.01.2022	06	Positive	R	R	S	R	R	R	R	R
23	F	21.10.2021	02	Positive	R	R	S	R	R	R	R	R
24	G	29.09.2021	06	Positive	R	R	S	R	R	R	R	R
25	G	29.06.2021	10	Negative	R	R	S	R	R	R	R	R
26	H	14.06.2021	03	Positive	R	R	S	R	R	R	R	R
27	H	18.03.2021	01	Positive	R	R	S	R	R	R	R	R
28	I	ATCC 17978			S	S	S	S	S	S	S	S

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A. baumannii izole edilen hastaların ortak özellikleri ve olası risk faktörleri

- Uzun sure ventilator kullanımı
- Kapalı sistem aspirasyon sistemi kullanılması
- Nemlendirici ve bakteri filtresi kullanılması
- Odaların komşuluğu
- Ortak doktor, hemşire ve portör tarafından bakım verilmesi
- Hastaların büyük bir kısmının trakeal aspiratında fenotipik benzerliği olan *Acinetobacter baumanni* üreme olması

Pandemi Öncesi ve Sonrasında İnfeksiyon Kontrol Önlemleri

	Before *A. baumannii* outbreak	During *A. baumannii* outbreak
Training of healthcare workers		
PPE training	After recruitment	On daily basis
Preparation of cleaning solutions	After recruitment	On daily basis
Hand hygiene score	70%	97%
Glove usage	Double glove	Single glove
Cleaning procedures		
Types of cleaning solutions	Peracetic acid solution (2.0%) or chloride solution (0.1%)	Only chloride solution (0.1%)
Aspiration jars	Cleaned with surface wiping	Soaked in chloride solution
Cleaning routine	Single cleaning	Double cleaning
Ventilator related precautions		
Appropriate ventilator cleaning procedures	Standard cleaning procedures for ventilators	Separate procedures for each device
Ventilator cleaning	Ventilator cleaning	Ventilator disinfection
Transport ventilator filters	Inhalation port filter was changed	Filters for both inhalation and exhalation ports were changed
Environmental measures		
Environmental screening	None	*A. baumannii* infected rooms
Clonality surveillance	None	PFGE
Isolation of COVID-19 patients in rooms 1–8	Yes	Yes

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	ESCMID Guideline	APIC Guideline	WHO Guideline	AH
Administrative support		√		√
Communication (patient-HCW, HCW-HCW)		√		√
Reservoir search, environmental cultures		√	√	√
Cohort patients		√	√	√
Cohort staff		√		√
Ward closure/deferred admits if transmission control failure		√		–
Hyper-aggressive room cleaning/Environmental cleaning	√	√	√	√
Equipment reprocessing review		√		√
Hand Hygiene/ Hand hygiene monitoring	√	√	√	√
Active Surveillance	√	√	√	√
Contact Preautions/Contact Precautions & PPE use monitoring	√	√	√	√
Alert code	√			–
Isolation Room	√		√	√
Education	√			√
Antimicrobial stewardship	√			√
Infection prevention and control (IPC) infrastructure	√			√

Teşekkürler

Amerikan Hastanesi ve Koç Üniversitesi Tıp Fakültesi

Enfeksiyon Kontrol Ekibi ve Komitesi

ESCMID COLLABORATIVE CENTRE

https://kuiscid.ku.edu.tr