YILIN SES GETİREN MAKALELERİ

Dr. Şiran Keske
VKV Amerikan Hastanesi

Import and spread of extended-spectrum β-lactamase-producing Enterobacteriaceae by international travellers (COMBAT study): a prospective, multicentre cohort study

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Summary

Background International travel contributes to the dissemination of antimicrobial resistance. We investigated the acquisition of extended-spectrum β-lactamase-producing Enterobacteriaceae (ESBL-E) during international travel, with a focus on predictive factors for acquisition, duration of colonisation, and probability of onward transmission.

Methods Within the prospective, multicentre COMBAT study, 2001 Dutch travellers and 215 non-travelling household members were enrolled. Faecal samples and questionnaires on demographics, illnesses, and behaviour were collected before travel and immediately and 1, 3, 6, and 12 months after return. Samples were screened for the presence of ESBL-E. In post-travel samples, ESBL genes were sequenced and PCR with specific primers for plasmid-encoded β-lactamase enzymes TEM, SHV, and CTX-M group 1, 2, 8, 9, and 25 was used to confirm the presence of ESBL genes in follow-up samples. Multivariable regression analyses and mathematical modelling were used to identify predictors for acquisition and sustained carriage, and to determine household transmission rates. This study is registered with ClinicalTrials.gov, number NCT01676974.

Findings 633 (34·3%) of 1847 travellers who were ESBL negative before travel and had available samples after return had acquired ESBL-E during international travel (95% CI 32·1–36·5), with the highest number of acquisitions being among those who travelled to southern Asia in 136 of 181 (75·1%, 95% CI 68·4–80·9). Important predictors for acquisition of ESBL-E were antibiotic use during travel (adjusted odds ratio 2·69, 95% CI 1·79–4·05), traveller's diarrhoea that persisted after return (2·31, 1·42–3·76), and pre-existing chronic bowel disease (2·10, 1·13–3·90). The median duration of colonisation after travel was 30 days (95% CI 29–33). 65 (11·3%) of 577 remained colonised at 12 months. CTX-M enzyme group 9 ESBLs were associated with a significantly increased risk of sustained carriage (median duration 75 days, 95% CI 48–102, p=0·0001). Onward transmission was found in 13 (7·7%) of 168 household members. The probability of transmitting ESBL-E to another household member was 12% (95% CI 5–18).

Interpretation Acquisition and spread of ESBL-E during and after international travel was substantial and worrisome. Travellers to areas with a high risk of ESBL-E acquisition should be viewed as potential carriers of ESBL-E for up to 12 months after return.

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- Seyahat’in ESBL ile kolonize olma üzerine etkisi
- Kolonizasyon risk faktörleri
- Kolonizasyon süresi
- Ev halkına bulaş

Arcilla MS, et al. *Lancet Infect Dis*. 2017;17(1):78-85.

- Prospektif, Hollanda
- Kasım 2012 – Kasım 2013 arası
- 1 hafta-3 ay arası yurt dışı seyahat eden $\geq$18 yaş
- Seyahatten önceki 1-3 hafta ve dönüşten sonraki 12 ay takip
- Aynı dönemde seyahat etmeyen ev halkı da inceleniyor

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- Seyahatten önce, seyahat bitiminde ve seyahat bitiminden 1 ay sonra 3 rektal örnek
- ESBL (+)'liği saptanırsa 3, 6 ve 12 ay sonra rektal örnek alınıyor
- ESBL (+) saptanırsa ESBL gen microarray sonrasında PCR ile konfirmasyon

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- 2737'si tarandı
- 2001'i dahil edildi
- Ortanca yaş: 50.5 (32.8 – 60.7)
- %84.2 turizm amacıyla
- En çok güneydoğu Asya'ya (n=650)
- Seyahat öncesi 122'si ESBL (+)

	Travellers (n=2001)*	Non-travelling household members (n=215)†
Sex		
Male	920 (46·0%)	80 (37·2%)
Female	1081 (54·0%)	135 (62·8%)
Age (years)	50·5 (32·8–60·7)	46·9 (25·7-55·8)
Education level		
No education, elementary school, or prevocational secondary education	243 (12·4%)	78 (36·4%)
Vocational secondary education	280 (14·2%)	37 (17·3%)
Senior general secondary education or education up to university	200 (10·2%)	45 (21·0%)
Higher professional education	642 (32·7%)	53 (24·7%)
Academic (university) education	595 (30·3%)	38 (17·8%)
Antibiotic use in previous 3 months		
No	1760 (90·1%)	189 (88·3%)
Yes	194 (9·9%)	25 (11·7%)
Travel in past year		
None	185 (9·5%)	27 (12·6%)
In Europe	915 (46·9%)	124 (57·7%)
Outside Europe	852 (43·6%)	64 (29·8%)
Chronic disease‡		
No	1500 (77·2%)	173 (82·0%)
Yes	443 (22·8%)	38 (18·0%)
Chronic bowel disease‡		
No	1912 (97·4%)	212 (99·1%)
Yes	51 (2·6%)	2 (0·9%)
Continent visited during travel§		
Asia	1016 (50·8%)	NA
Africa	633 (31·6%)	NA
America	326 (16·3%)	NA
Europe	21 (1·0%)	NA
Oceania	5 (0·2%)	NA
Duration of index travel (days)	20 (15·0–25·0)	NA
Purpose of index travel		
Holiday	1655 (84·2%)	NA
Work or internship	161 (8·2%)	NA
Visiting family or relatives	82 (4·2%)	NA
Other reason	66 (3·4%)	NA

Data are number (%) or median (IQR). NA=not applicable. *Some numbers do not add up to 2001 because of missing data. †Some numbers do not add up to 215 because of missing data. ‡Self-reported by traveller or household member. §If travellers visited multiple continents, only the main continent visited is presented in this table.

Table 1: **Baseline characteristics of travellers and non-travelling household members**

	Number of travellers (n=1847)*	Number of travellers who acquired ESBL-E (n=633)†	ESBL-E incidence proportion (95% CI)‡	Number of travel-days	Mean (SD) duration of travel (days)	ESBL-E incidence per 100 person-days of travel (95% CI)§
Southern Asia	181 (9·8%)	136 (21·5%)	75·1 (68·4–80·9)	3727	20·6 (11·0)	7·2 (5·9–8·6)
Central and eastern Asia	84 (4·5%)	41 (6·5%)	48·8 (38·4–59·3)	1712	20·4 (10·8)	3·5 (2·5–4·7)
Western Asia	28 (1·5%)	12 (1·9%)	42·9 (26·5–60·9)	305	10·9 (7·5)	5·8 (3·0–9·9)
Northern Africa	81 (4·4%)	34 (5·4%)	42·0 (31·8–52·9)	981	12·1 (5·7)	4·5 (3·1–6·2)
Southeastern Asia	540 (29·2%)	200 (31·6%)	37·0 (33·1–41·2)	12 493	23·1 (11·6)	2·1 (1·8–2·4)
Caribbean and Central America	86 (4·7%)	24 (3·8%)	27·9 (19·5–38·2)	1653	19·2 (12·4)	1·7 (1·1–2·5)
Middle and eastern Africa	205 (11·1%)	57 (9·0%)	27·8 (22·1–34·3)	4060	19·8 (14·3)	1·6 (1·2–2·1)
Western Africa	106 (5·7%)	20 (3·2%)	18·9 (12·6–27·4)	1638	15·5 (11·1)	1·4 (0·8–2·0)
South America	180 (9·7%)	33 (5·2%)	18·3 (13·4–24·6)	4778	26·5 (14·7)	0·8 (0·5–1·1)
Southern Africa	116 (6.3%)	7 (1·1%)	6·0 (2·5–12·0)	2522	21·7 (8·6)	0·3 (0·1–0·6)
Northern America, Europe, and Oceania	17 (1·0%)	1 (<1·0%)	5·9 (1·1–27·0)	292	17·2 (11·3)	0·4 (0–1·6)

ESBL-E=extended-spectrum β-lactamase-producing Enterobacteriaceae. *Numbers do not add up to 1847 because 221 travellers visited more than one subregion (66 with ESBL-E acquisition) and destination information was missing for two. †Numbers do not add up to 633 because 66 travellers visited multiple subregions and destination information was missing for two. ‡Based on binomial distribution (Wilson's score interval). §Calculated with the maximum likelihood estimation method based on a constant acquisition rate with right-censored and interval-censored data.

***Table 2*: Incidence proportion and incidence per 100 person-days of travel for ESBL-E acquisition in Dutch travellers, by subregion**

- 1847 kişinin 633 (%34)'ünde ESBL (+)'liği saptanıyor.
- Pozitif örneklerin %53.4'ünde CTX-M-15 geni saptanıyor.

Arcilla MS, et al. *Lancet Infect Dis*. 2017;17(1):78-85.

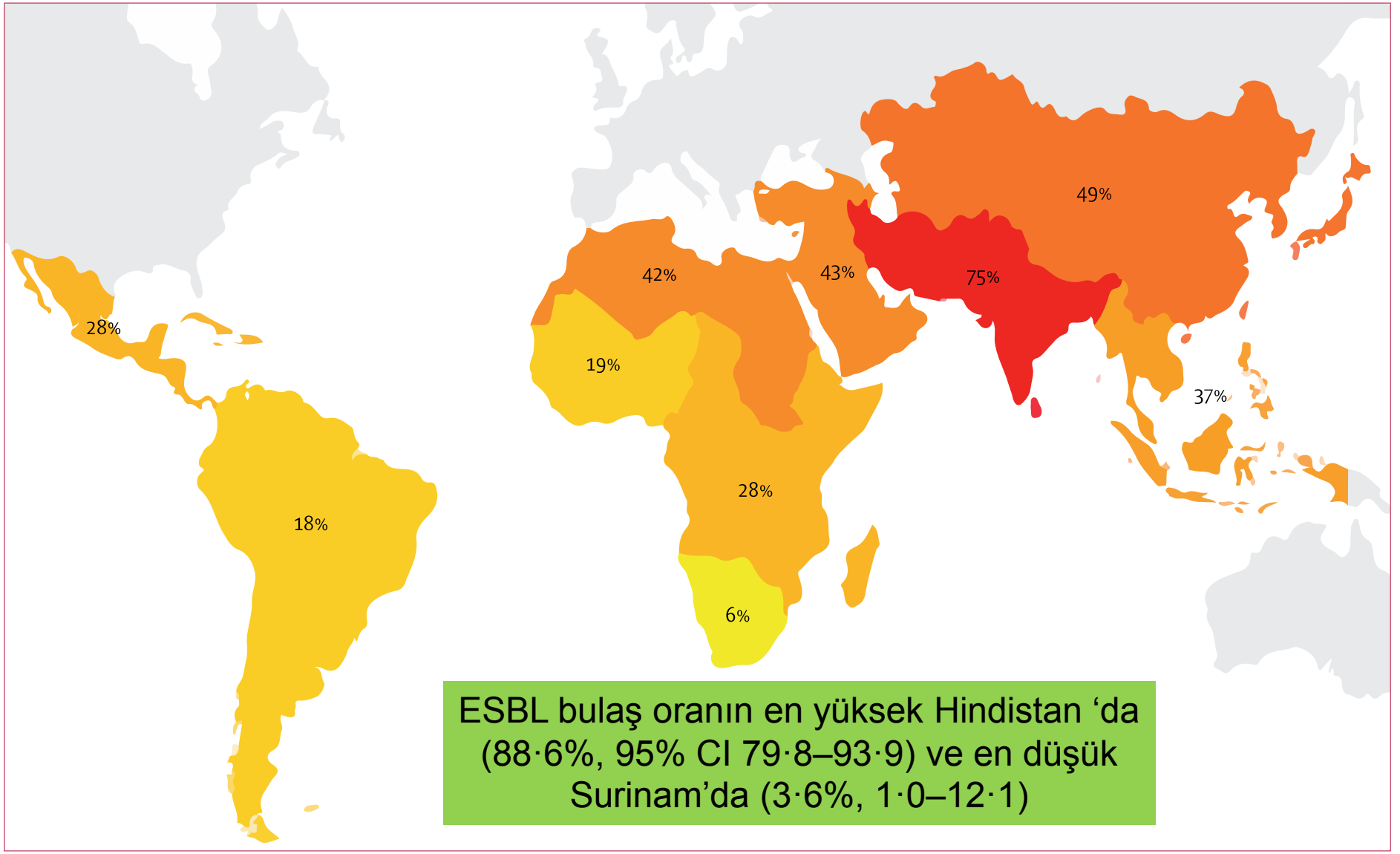

Figure 1: **Percentages of travellers that acquired β-lactamase-producing Enterobacteriaceae per subregion, according to the United Nations geoscheme**

Arcilla MS, et al. *Lancet Infect Dis*. 2017;17(1):78-85.

	Number of travellers at risk (n=1847)*	Number of travellers who acquired ESBL-E (n=633)†	Odds ratio (95% CI)‡	p value	Adjusted odds ratio (95% CI)§	p value
Pre-existing bowel disease						
No	1793 (97·3%)	606 (33·8%)	1·00	..	1·00	..
Yes	50 (2·7%)	24 (48·0%)	2·34 (1·26–4·34)	0·007	2·10 (1·13–3·90)	0·019
Beach holiday						
No	1404 (76·1%)	504 (35·9%)	1·00	..	1·00	..
Yes	441 (23·9%)	127 (28·8%)	0·72 (0·55–0·93)	0·010	0·73 (0·56–0·95)	0·021
Traveller's diarrhoea¶						
No	1085 (60·1%)	329 (30·3%)	1·00	..	1·00	..
During travel	593 (32·8%)	235 (39·6%)	1·56 (1·24–1·96)	<0·001	1·42 (1·12–1·80)	0·003
Immediately after travel	41 (2·3%)	14 (34·1%)	1·19 (0·58–2·44)	0·640	1·3 (0·63–2·68)	0·477
During travel and immediately after travel	87 (4·8%)	44 (50·6%)	2·42 (1·50–3·91)	<0·001	2·31 (1·42–3·76)	0·001
Antibiotic use during travel‖						
No	1697 (92·8%)	553(32·6%)	1·00	..	1·00	..
Yes	132 (7·2%)	73 (55·3%)	2·65 (1·80–3·91)	<0·001	2·69 (1·79–4·05)	<0·001
Attendance of large (religious) gathering						
No	1744 (94·6%)	595 (34·1%)	1·00	..	1·00	..
Yes	100 (5·4%)	36 (36·0%)	0·56 (0·34–0·92)	0·020	0·57 (0·34–0·94)	0·028
Daily hand hygiene before meals						
None	782 (42·4%)	265 (33·9%)	1·00	..	1·00	..
Clean with alcohol	161 (8·7%)	69 (42·9%)	1·03 (0·71–1·51)	0·870	0·97 (0·66–1·44)	0·885
Clean with soap	666 (36·1%)	200 (30·0%)	0·82 (0·64–1·04)	0·100	0·77 (0·60–0·99)	0·044
Clean with alcohol and soap	235 (12·7%)	97 (41·3%)	1·03 (0·74–1·44)	0·860	1·12 (0·79–1·59)	0·518
Meal at street food stalls during travel						
Never	1248 (67·7%)	386 (30·9%)	1·00	..	1·00	..
Occasionally	513 (27·8%)	205 (40·0%)	1·37 (1·08–1·73)	0·010	1·33 (1·04–1·71)	0·022
Daily	83 (4·5%)	40 (48·2%)	2·09 (1·30–3·38)	0·003	1·78 (1·07–2·95)	0·025

ESBL-E=extended-spectrum β-lactamase-producing Enterobacteriaceae. *Numbers do not add up to 1847 because of missing values. Valid percentages are reported after removal of missing values, which were assumed to be random. †Numbers do not add up to 633 because of missing values. The demoninators for percentages are the numbers of travellers at risk given in the previous column. ‡Only adjusted for travel destination subregion, defined according to the United Nations geoscheme: Caribbean and Central America, middle and eastern Africa, central and eastern Asia, North America, Europe, and Oceania, southern Asia, southeastern Asia, western Asia, northern Africa, southern Africa, western Africa, and South America. §Adjusted for travel destination and travel variables shown in table. ¶Defined as ≥3 unformed stools within 24 h, with or without accompanying symptoms. ‖Most frequently used to treat gastroenteritis (41 [31·1%] of 132 travellers), of whom 17 (41·5%) took them without consulting a doctor.

***Table 3*: Predictors for ESBL-E acquisition among travellers in the final adjusted logistic regression model**

Risk Faktörleri

- Güneydoğu Asya'da;
  - Çiğ sebze tüketimi
  - Antibiyotik kullanımı
- Güney Asya'da
  - Kimsesiz çocuklarla temas
  - Hostel ya da misafirhanelerde her gün gıda tüketimi
- Doğu Asya'da
  - Yerel pazarlara günlük ziyaret
  - Kırsal bölgede kalma

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- Seyahat sonrası ESBL taşıyıcılık oranı
  - 1. ay: %42.9
  - 3. ay: %25.1
  - 6. ay: %14.3
  - 12. ay: %11.3

- Markov modelleme çalışması ile ESBL pozitif birinden ESBL negatif ev halkına geçiş oranı %12 olarak bulunmuş.

Arcilla MS, et al. *Lancet Infect Dis*. 2017;17(1):78-85.

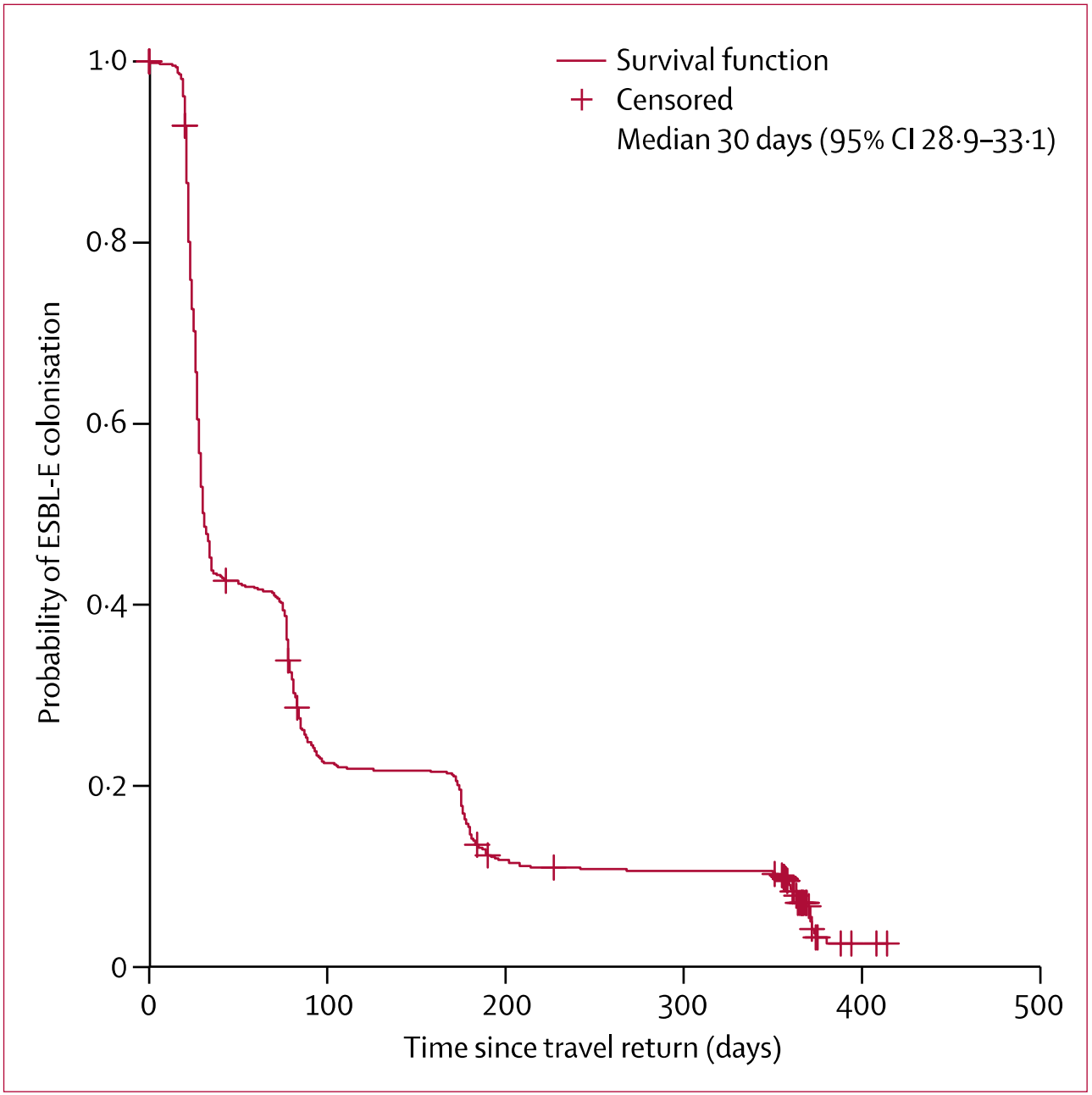

Figure 2: **Kaplan-Meier estimate of time to decolonisation of ESBL-E in travellers**

Sonuç olarak

- 320 milyon kişi her yıl Asya, Kuzey Afrika ve Orta Doğu'yu ziyaret ediyor.
- Bu çalışma ile seyahatin ESBL taşıyıcılığı üzerine etkisi olduğu gösterilmiştir.
- Hollanda nüfusunun %3.0 ile %7.1'isinin seyahat yoluyla ESBL ile kolonize oldukları tahmin edilmektedir.
- Toplamda
  - %34.3 ESBL bulaşı
  - Seyahat sonrası 12. ayda %12 taşıyıcılık
  - Ev halkına %12 bulaş olasılığı

düşünüldüğünde yurt dışı seyahatin dirençli patojenlere maruz kalma, bu patojenleri taşıma ve diğer kişilere bulaştırma açısından son derece önemli olduğu görülmektedir.

Arcilla MS, et al. *Lancet Infect Dis*. 2017;17(1):78-85.

Antiviral Research 137 (2017) 134–140

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

The FDA-approved drug sofosbuvir inhibits Zika virus infection

Kristen M. Bullard-Feibelman [a], Jennifer Govero [c], Zhe Zhu [g], Vanessa Salazar [c], Milena Veselinovic [a], Michael S. Diamond [c, d, e, f], Brian J. Geiss [a, b, *]

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[b] School of Biomedical Engineering, Colorado State University, Fort Collins, CO, USA
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[e] Department of Molecular Microbiology, Washington University School of Medicine, Saint Louis, MO, USA
[f] The Center for Human Immunology and Immunotherapy Programs, Washington University School of Medicine, Saint Louis, MO, USA
[g] Department of Stem Cell Biology and Regenerative Medicine, Lerner Research Institute, Cleveland Clinic, Cleveland, OH, USA

- Zika virus (ZIKV)
  - Flavivirus-RNA virusu
- Yapısal olmayan proteinler (NS1, NS2A, NS2B, NS3, NS4A, NS4B ve NS5)
- NS5'in C ucunda RNA bağımlı RNA polimeraz (RdRp) var.
- RdRp üzerinden etki eden sofosbuvir HCV tedavisinde oldukça etkili.

Bullard-Feibelman KM. Antiviral Res. 2017;137:134-140

- Yapılan bir çalışmada sofosbuvir 20 mcM ve 100 mcM dozlarında nöroepitelyal kök hücrelerdeki Zika virus NS1 antijen boyanmasını azalttığı gösterilmiş.

- Flaviviridae ailesinde RdRp'nin yapısal benzerliği nedeniyle HCV'ye etkili olan sofosbuvir ZIKV'ye de etkili olabilir mi?

Bullard-Feibelman KM. Antiviral Res. 2017;137:134-140

- ZIKV
  - PRVABC59 (Puerto Rico, 2015)
  - ZIKV Dakar 41519 (Senegal, 1984)
  - ZIKV Brezilya (Paraiba, 2015)
- Hücre
  - Vero (Afrika yeşil maymun böbrek epiteli)
  - Huh-7 (İnsan hepatoselüler karsinom)
  - Jar (insan koryokarsinom)
- In vitro viral infeksiyon ve ilaç deneyi
- Fare deneyi

Bullard-Feibelman KM. Antiviral Res. 2017;137:134-140

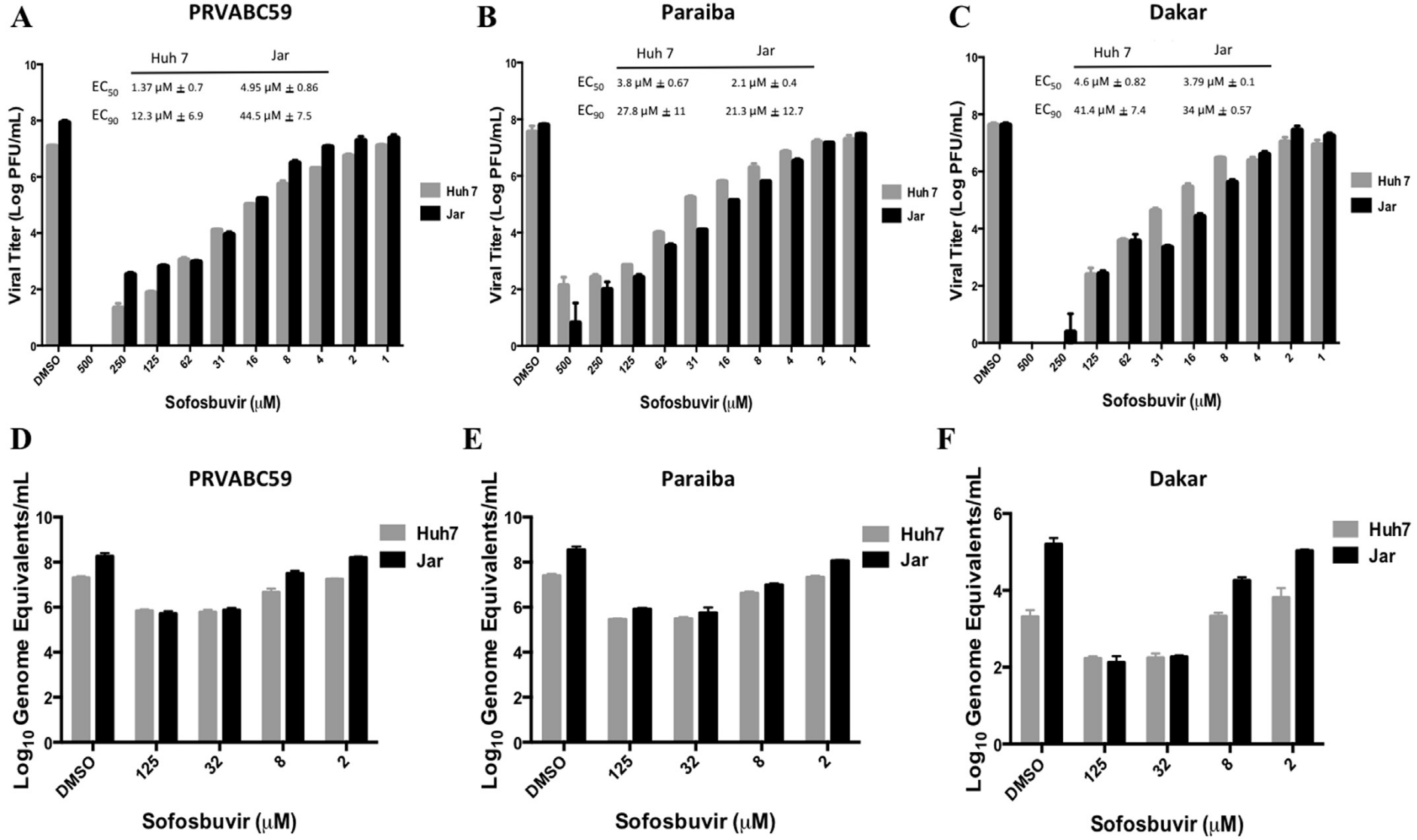
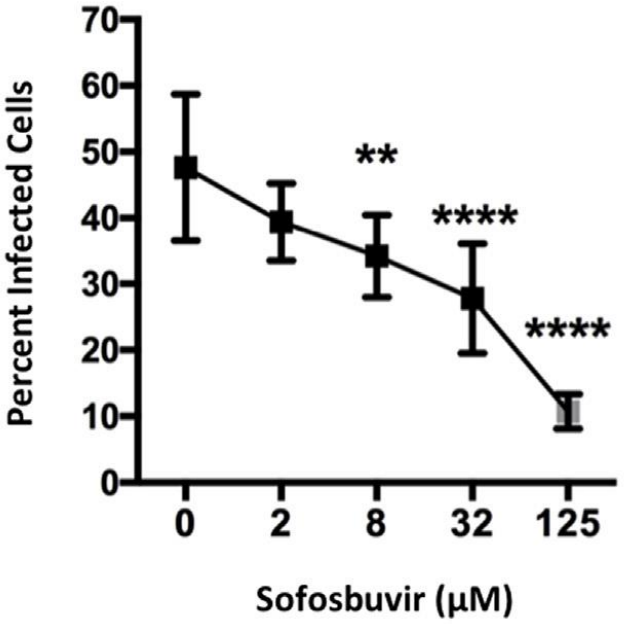


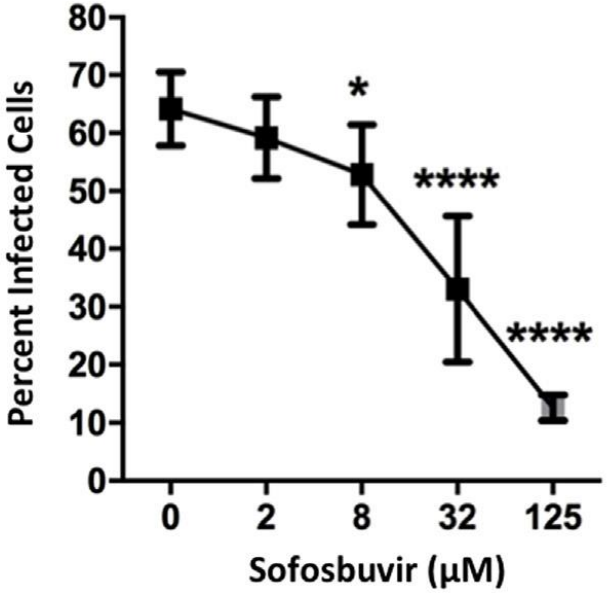
Fig. 1. Sofosbuvir reduces Zika virus titer in Huh-7 and Jar cells. Huh-7 and Jar cells were treated with concentrations of Sofosbuvir from 500 μM to 1 μM and concurrently infected with ZIKV PRVABC59, Dakar 41519, or Paraiba strains at a MOI of 0.1. Plates were incubated at 37 °C for 72 h and viral titers at each concentration were calculated by plaque assay (A–C) and qRT-PCR (D–F). Results are the average of three independent biological replicates with standard deviation shown.

Bullard-Feibelman KM. Antiviral Res. 2017;137:134-140

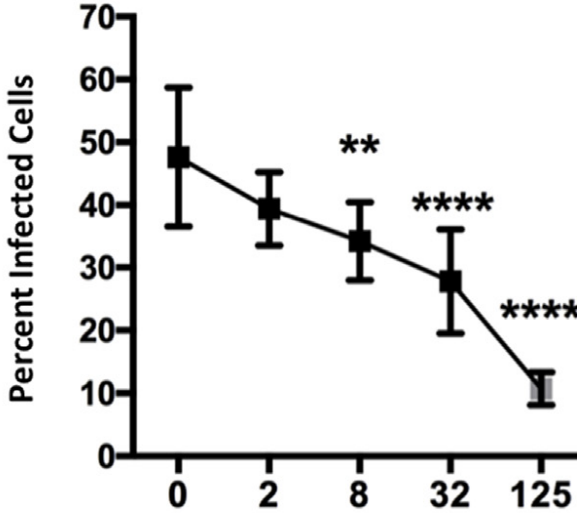
A


Hindbrain Neuronal Stem Cells
Percent Infected Cells
70
60
50
40
30
20
10
0
**
****
****
0
2
8
32
125
Sofosbuvir (μM)

B


Cortex Neuronal Stem Cells
Percent Infected Cells
80
70
60
50
40
30
20
10
0
*
****
****
0
2
8
32
125
Sofosbuvir (μM)

A


Hindbrain Neuronal Stem
Percent Infected Cells
70
60
50
40
30
20
10
0
**
****
0
2
8
32
125

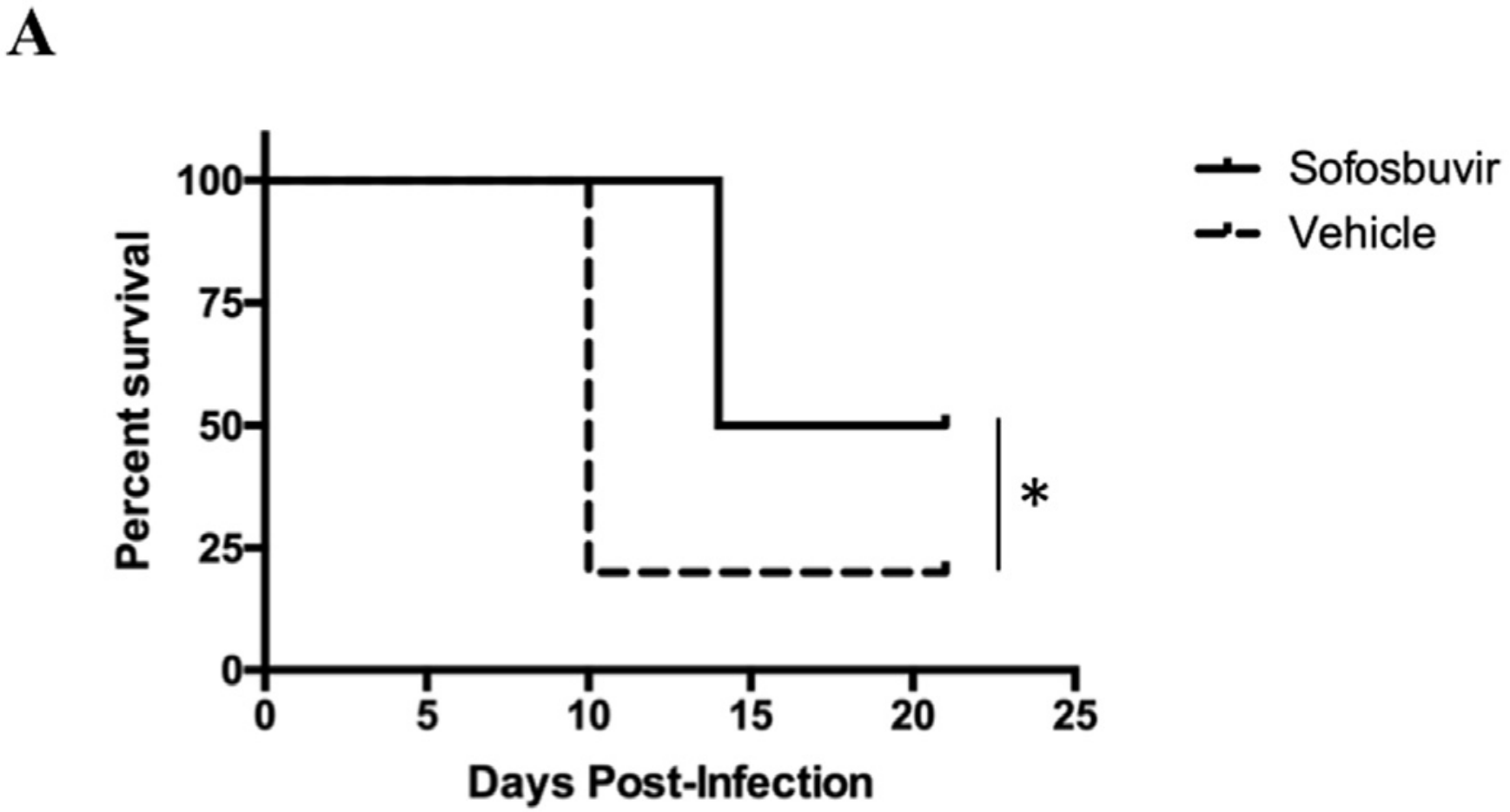


Fig. 4. Therapeutic effect of sofosbuvir in mice. Five week-old WT C57BL/6 mice were treated at day −1 with 2 mg of anti-Ifnar1 blocking mAb. On day 0, animals were inoculated via a subcutaneous route in the footpad with 10^5 FFU of mouse-adapted ZIKV Dakar. On day 1, oral therapy was initiated with ~33 mg/kg/day sofosbuvir dissolved in Kool-Aid® or Kool-Aid® vehicle control. Survival (**A**) and aggregate body

Sonuç olarak

- Sofosbuvirin ZIKV'yi inhibe ettiği gösterilmiştir.
- Gebelikte kullanımı önerilmemektedir.
- Daha fazla çalışma yapılmalıdır

Bullard-Feibelman KM. Antiviral Res. 2017;137:134-140

O zaman kime önerilmeli?

- Cinsel yolla bulaşı önlemesi ve kişilerde ortaya çıkma olasılığı olan komplikasyonları önlemek açısından erkeklerde ve hamile olmayan kadınlarda
- Endemik bölgeye seyahat edecek olanlara profilaksi amacıyla
- İnfeksiyon döngüsünü kırmak amacıyla

- **Yüksek maliyet**
  - $84000 (3 aylık)

Bullard-Feibelman KM. Antiviral Res. 2017;137:134-140

Risk Factors for Middle East Respiratory Syndrome Coronavirus Infection among Healthcare Personnel

Basem M. Alraddadi, Hanadi S. Al-Salmi, Kara Jacobs-Slifka, Rachel B. Slayton, Concepcion F. Estivariz, Andrew I. Geller, Hanan H. Al-Turkistani, Sanaa S. Al-Rehily, Haleema A. Alserehi, Ghassan Y. Wali, Abeer N. Alshukairi, Esam I. Azhar, Lia Haynes, David L. Swerdlow, John A. Jernigan,[1] Tariq A. Madani[1]

- 2012’de başladı
- 1728 olgu
- 624 ölüm
- Develer doğal konak
- 2014’te 255 olgunun bildirildiği yayında olguların %31’i sağlık çalışanı
- Amaç sağlık çalışanında MERS-CoV risk faktörleri

Alraddadi BM, et al. *Emerg Infect Dis*. 2016;22(11):1915-20

- Kral Faysal Hastanesi
- 24 Mart – 3 Mayıs 2014 arası 17 MERS CoV infeksiyonu olan olgu yatırılarak izlenmiş
- Tüm hastalar tek kişilik negatif basınçlı odada
- Şüpheli olgular da aynı koşullarda
- Olgularla temas eden tüm sağlık çalışanları (SÇ)'nın nazofarenks örneğinde rRT-PCR ile virüs araştırılmış.

Alraddadi BM, et al. *Emerg Infect Dis*. 2016;22(11):1915-20

- 3 kohort seçilmiş
  - Acil servis
  - YBÜ
  - Nöroloji (Kontrol)
- 24 Mart-14 Mayıs arası çalışan tüm SÇ'den serumda MERS-CoV antikoru bakılmış.
- Ayrıca hepsine anket uygulanmış (PPE, temas tipi, süresi vb).

Alraddadi BM, et al. *Emerg Infect Dis*. 2016;22(11):1915-20

SONUÇLAR

- YBÜ: 131
- Acil: 127
- Nöroloji: 34
- MERS CoV atak hızı % 8 (20/350)
  - YBÜ: %11.7 (n=15)
  - Acil: %4.1 (n=5)
  - Nöroloji: %0

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- En yüksek atak hızları
  - Radyoloji teknisyenleri: %29.4 (5/17)
  - Hemşireler: %9.4 (13/138)
  - Solunum terapisti: %3.2 (1/31)
  - Hekimler: %2.4 (1/41)
- Cinsiyetler arası anlamlı fark yok
- Seropozitif SÇ ortanca yaş: 40 (29-59)
- Seronegatif SÇ ortanca yaş: 37 (18-66)

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Table 1. MERS-CoV symptoms reported by healthcare personnel, King Faisal Specialist Hospital and Research Center, Jeddah, Saudi Arabia, March–July 2014*

Symptom	Seropositive, no./No.† (%)	Seronegative, no./No.† (%)	p value
Muscle pain	13/20 (65.0)	66/260 (25.4)	0.0001
Fever	12/19 (63.2)	42/258 (16.3)	<0.0001
Dry cough	11/20 (55.0)	80/262 (30.5)	0.02
Headache	11/20 (55.0)	80/262 (30.5)	0.02
Diarrhea	7/20 (35.0)	21/262 (8.0)	0.0001
Nausea	7/20 (35.0)	18/262 (6.9)	<0.0001
Shortness of breath	7/20 (35.0)	32/261 (12.3)	0.005
Runny nose	6/19 (31.6)	92/263 (35.0)	0.76
Chills	6/20 (30.0)	23/261 (8.8)	0.003
Sore throat	5/20 (25.0)	118/263 (44.9)	0.08
Vomiting	4/20 (20.0)	10/262 (3.8)	0.01
Productive cough	3/18 (16.7)	39/263 (14.8)	0.74
Rash	1/20 (5.0)	4/259 (1.5)	0.26
None	3/20(15.0)	94/263 (35.7)	0.019

*MERS-CoV, Middle East respiratory syndrome coronavirus.
†Denominator is the number of healthcare personnel who responded to the question.

- Toplam 20 olgunun
  - 3’ü asemptomatik
  - 12’si hafif hastalık
  - 2’si orta düzeyde hastalık (Yatan, MV gerektirmeyen)
  - 3’ü ciddi hastalık (MV gerektiren)
- Mortalite görülmemiş
- rRT PCR testi 5’inde pozitif (%25)
- 19 olgu hasta ile aynı odada hastaya 2 m’den daha yakın, 1’inde hasta ile temas yok, hasta biriyle beraber yolculuk öyküsü var

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Table 3. PPE used by healthcare personnel during care of MERS-CoV patients, King Faisal Specialist Hospital and Research Center, Jeddah, Saudi Arabia, March–July 2014*

PPE used, contact type	Always wore PPE,† no. seropositive/total‡ (%)	Sometimes/never wore PPE,§ no. seropositive/total‡ (%)	RR (95% CI)	p value
Gloves	18/197 (9.1)	0/21 (0)	NA	NA
Gown	11/139 (7.9)	7/79 (8.9)	0.89 (0.36–2.21)	0.81
Eye protection				
Direct contact	1/47 (2.1)	17/165 (10.3)	0.21 (0.03–1.51)	0.13
Aerosol-generating procedure	3/62 (4.8)	11/100 (11.0)	0.44 (0.13–1.51)	0.25
Covering of nose and mouth with medical mask or N95 respirator¶				
Direct patient contact	11/151 (7.3)	7/66 (10.6)	0.69 (0.28–1.69)	0.43
Aerosol-generating procedures	8/133 (6.0)	6/32 (18.8)	0.32 (0.12–0.86)	0.03
Medical mask				
Direct patient contact	9/69 (13.0)	9/142# (6.3)	2.06 (0.86–4.95)	0.10
Aerosol-generating procedures	5/81 (6.2)	8/76 (10.5)	0.59 (0.20–1.71)	0.39
N95 respirator				
Direct patient contact	6/116 (5.2)	12/101** (11.9)	0.44 (0.17–1.12)	0.07
Aerosol-generating procedures	5/90 (5.6)	9/73 (12.3)	0.45 (0.16–1.29)	0.16

*MERS-CoV, Middle East respiratory syndrome coronavirus; NA, not applicable; PPE, personal protective equipment; RR, relative risk.
†Reported always wearing PPE indicated in table row when caring for MERS-CoV patients.
‡Total number of healthcare personnel who responded to the question about PPE.
§Reported not always or never wearing PPE indicated in table row when caring for MERS-CoV patients.
¶Reported use of medical mask and N95 respirator were not mutually exclusive categories; therefore the number of healthcare personnel reporting always wearing either an N95 respirator or always wearing a medical mask does not sum to the "covering of nose and mouth with medical mask or N95 respirator" category.
#Of the 142 who reported not always or never wearing a medical mask, 139 (98%) reported always or not always wearing an N95 respirator (55% always, 45% not always).
**Of the 101 who sometimes or never wore an N95 respirator, 96 (95%) reported always or not always wearing a medical mask (35% always, 65% not always).

Sonuç olarak

- Bu seroepidemiyolojik çalışmada atak hızı öncekilerle karşılaştırıldığında oldukça yüksek bulunmuş (Serolojik test kullanımı)
- İnfeksiyon çoğunlukla hafif hastalık olarak görülmüş
- Yakın temasta N95 maskenin önemini göstermesi açısından önemlidir (Aerosol içeren prosedürler)
- İnfeksiyon kontrol önlemlerini daha iyi bilmek MERS-CoV'ye karşı koruyucu bu nedenle temel uygulamalara uyum ile infeksiyon SÇ arasında etkin olarak önlenebilmektedir.

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Cell Host & Microbe
Brief Report

Wolbachia Blocks Currently Circulating Zika Virus Isolates in Brazilian *Aedes aegypti* Mosquitoes

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- Zika virus
- *Aedes aegypti*
  - Vektör Kontrolü
- Wolbachia:
  - %40
  - Dengue, Chikungunya, Plasmodium

Dutra HL, et al. *Cell Host Microbe*. 2016;19(6):771-4.

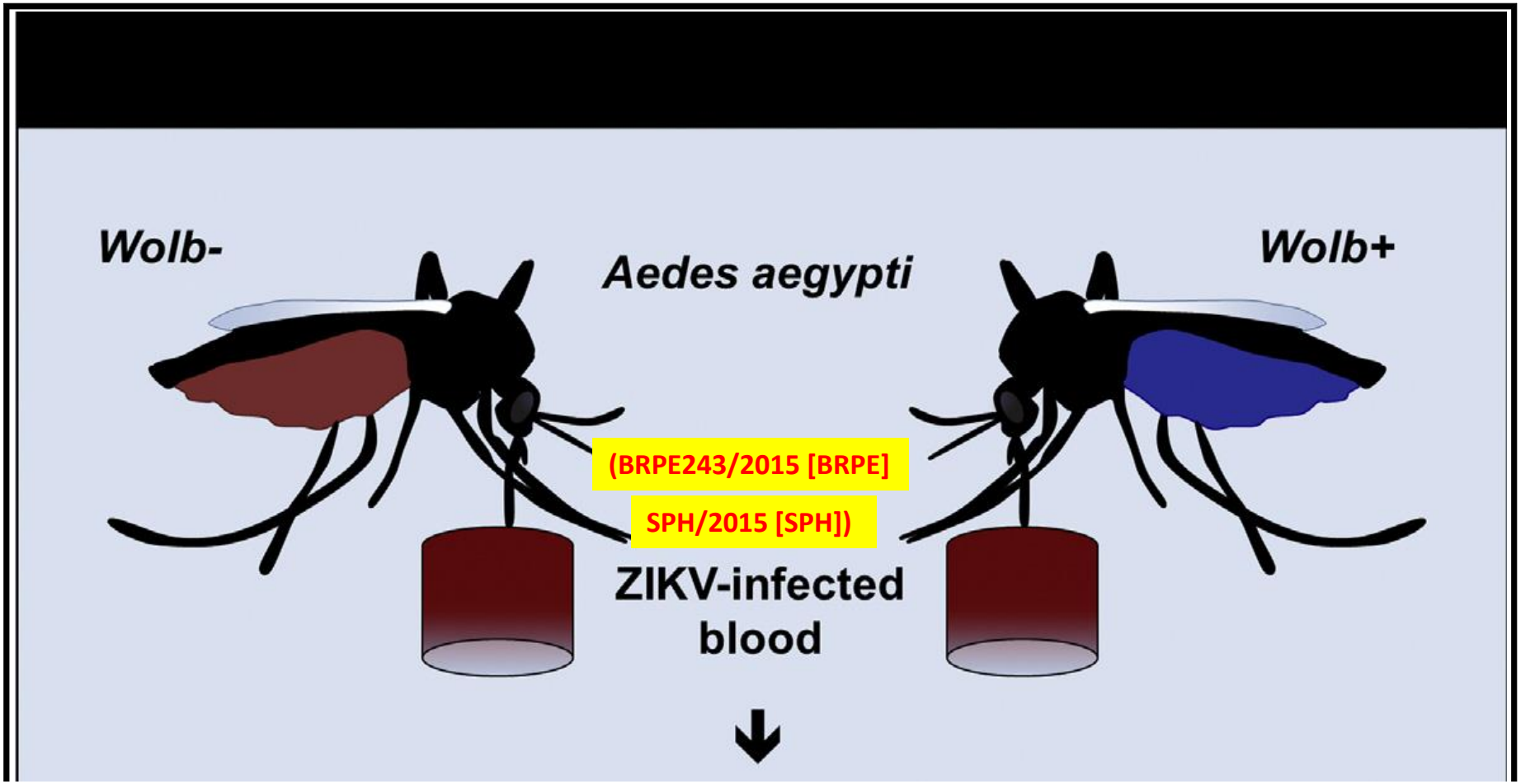

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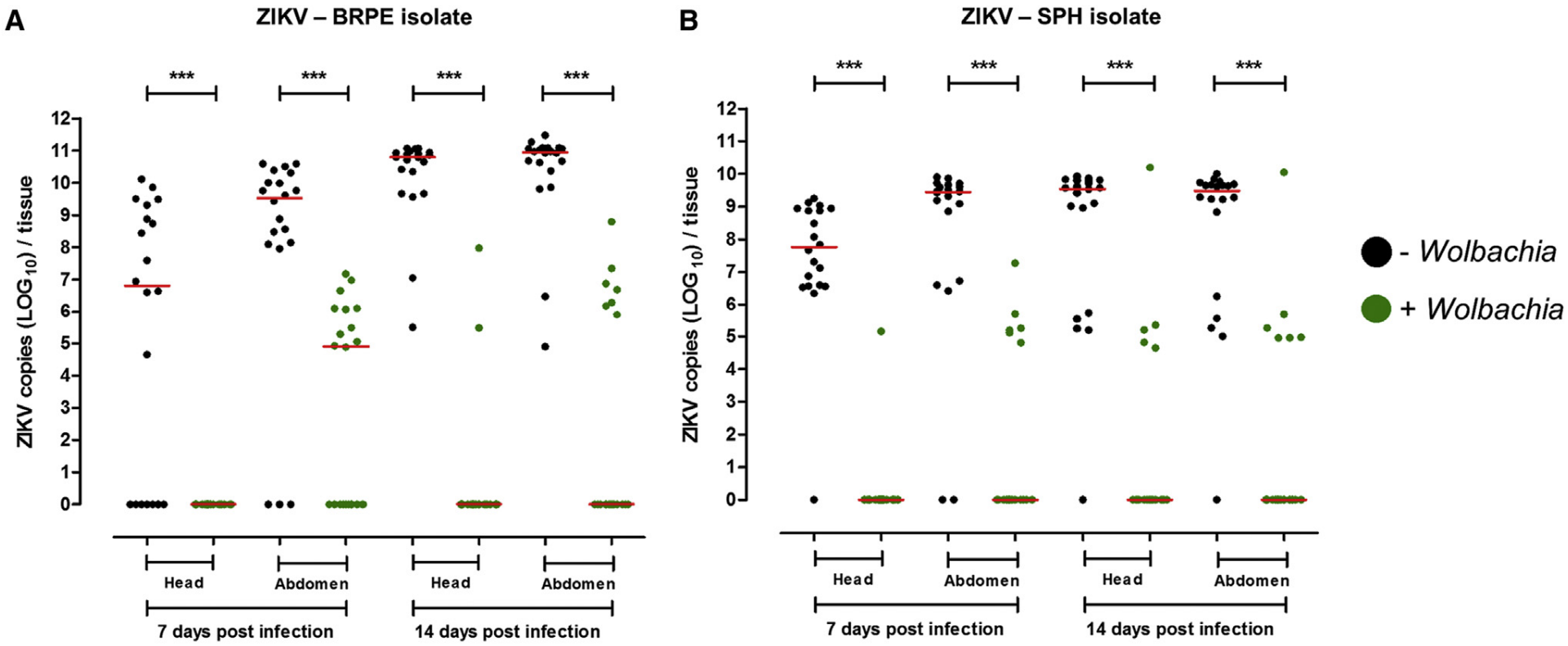
Table 1. Effects of *Wolbachia* on ZIKV Prevalence

			*w*Mel_Br	Br	*w*Mel_Br	Br	*w*Mel_Br	Br
Isolate	ZIKV Titer (PFU/mL)	Days Post-infection	Head/Thorax Infection Rate		Abdomen Infection Rate		Saliva Infection Rate	
BRPE	5.0×10^6	7	0	65	55	85	–	–
		14	10	100	35	100	45	100
SPH	8.7×10^3	7	5	95	30	90	–	–
		14	25	95	30	95	–	–

Ae. aegypti were orally infected with fresh, low-passage ZIKV. Initial viral titer was determined by plaque-forming assay. Saliva infection was only examined for mosquitoes at 14 days post-infection with the BRPE isolate. Infection rates are given as percentages. n = 20 per group unless specified. ZIKV, Zika virus; PFU, plaque-forming units; BRPE, ZIKV/*H. sapiens*/Brazil/BRPE243/2015; SPH, ZIKV/*H. sapiens*/Brazil/SPH/2015; *w*Mel_Br, *Wolbachia*-infected; Br, *Wolbachia*-uninfected.



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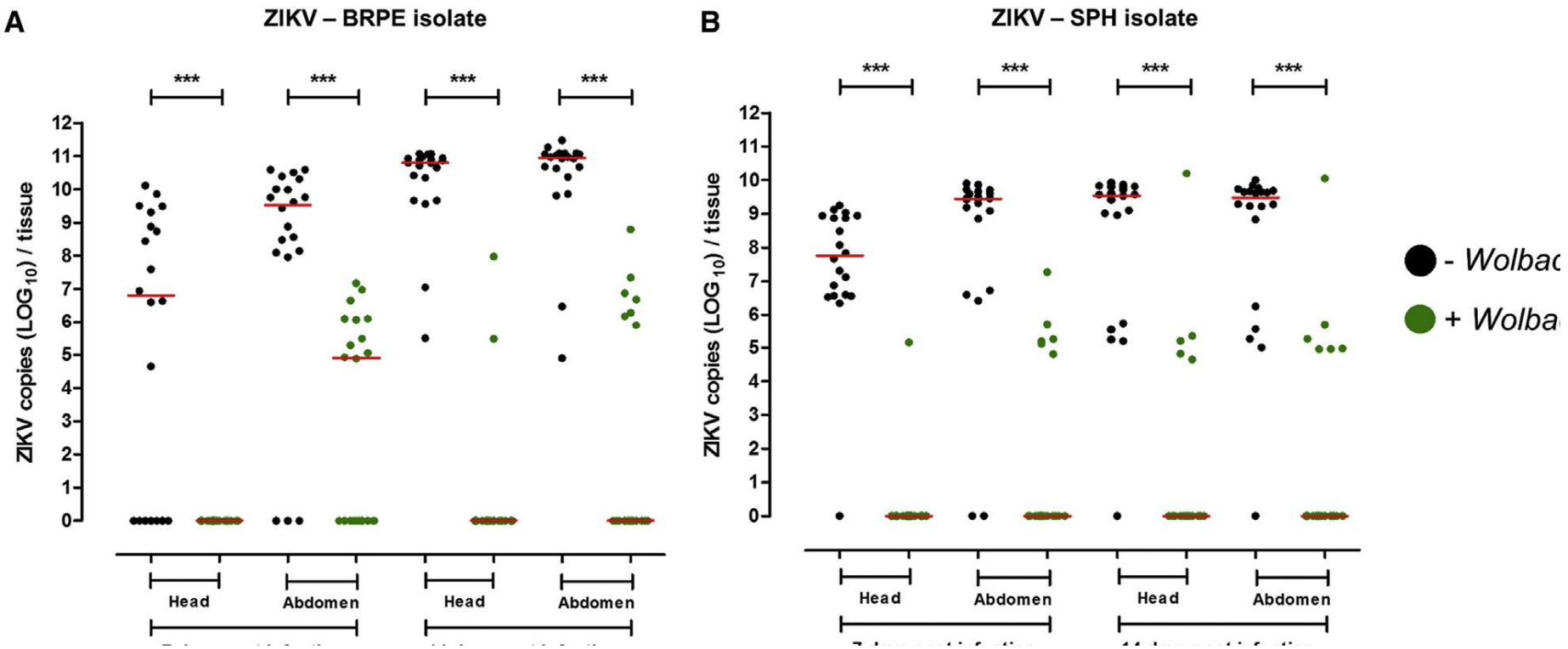

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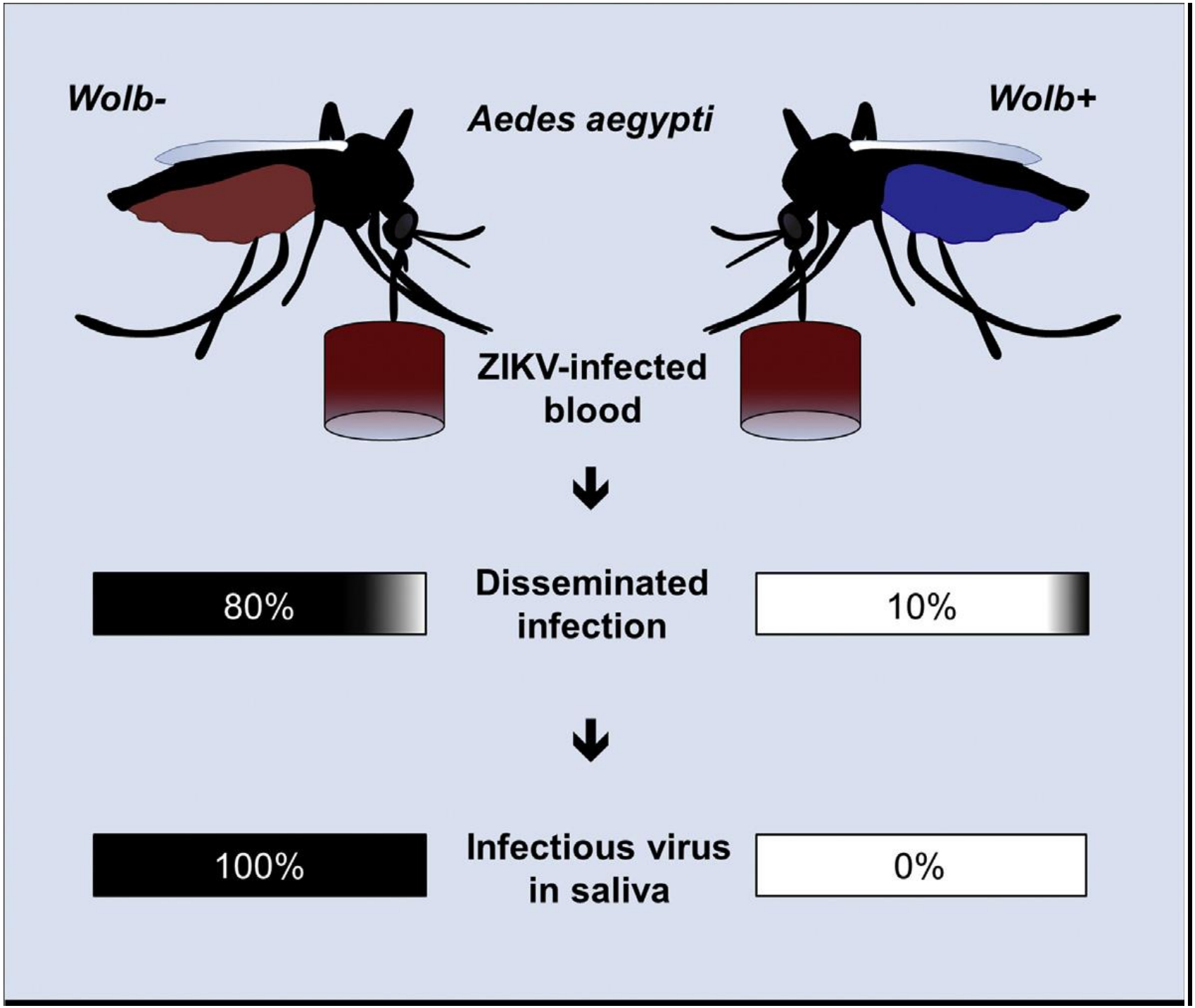
Wolb-
Aedes aegypti
Wolb+
ZIKV-infected blood
80%
Disseminated infection
10%
100%
Infectious virus in saliva
0%