

İNFEKTİF ENDOKARDİT:
GÜNCEL BİLGİLER, YEREL VERİLER

21-22 EKİM 2017

Sağlık Bilimleri Üniversitesi
Dr. Siyami Ersek Göğüs, Kalp ve Damar Cerrahisi
Eğitim ve Araştırma Hastanesi
İstanbul



İnfektif Endokardit Tanısı: Kan Kültürünü Ne Kadar Doğru Alıyoruz?

Dr Gökhan AYGÜN

Cerrahpaşa Tıp Fakültesi

Tıbbi Mikrobiyoloji AD

İnfektif Endokardit

- Seyrek fakat mortalitesi yüksek bir klinik tablo:
 - * 3-7/100.000 kişi/yıl (1.3-11)

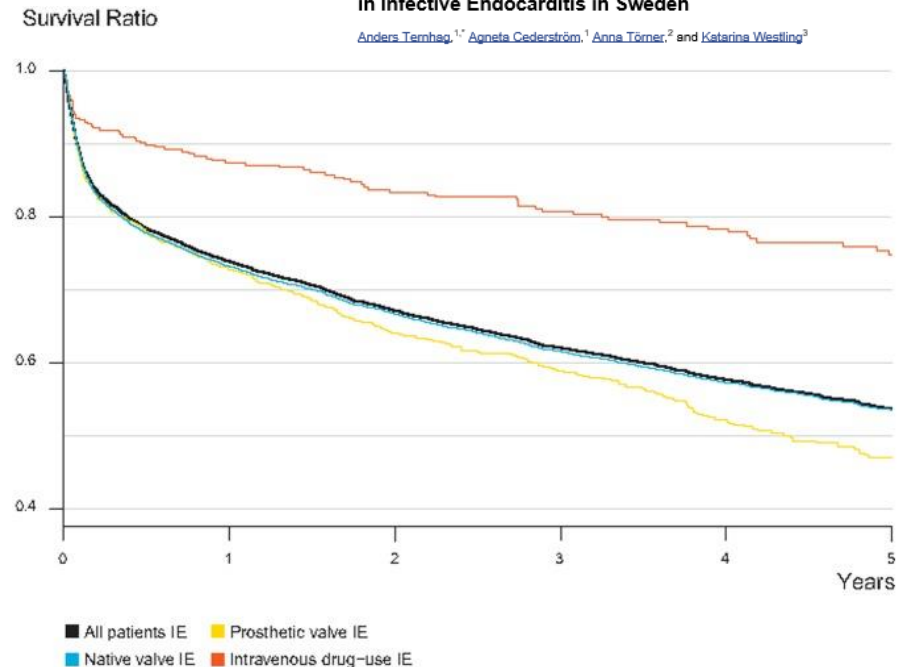
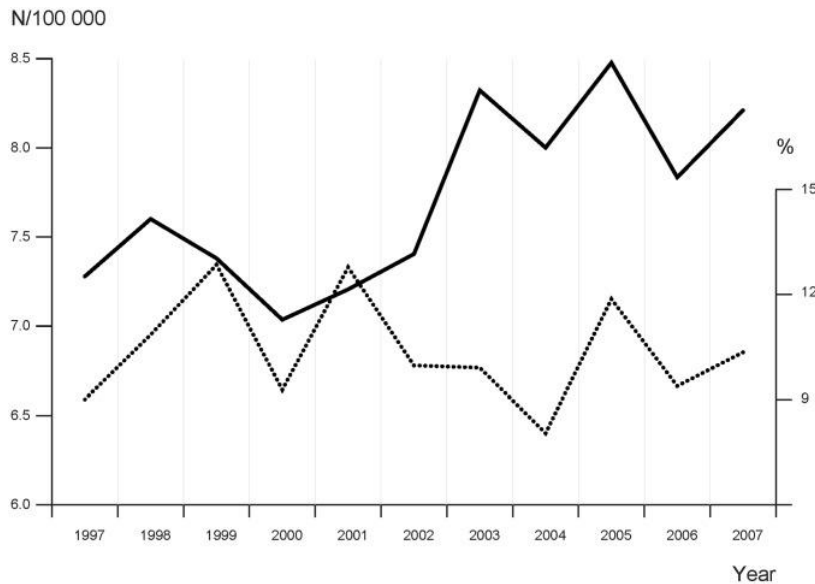


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PMCID: PMC3704638

A Nationwide Cohort Study of Mortality Risk and Long-Term Prognosis in Infective Endocarditis in Sweden

Anders Ternhag,^{1*} Agneta Cederström,¹ Anna Törner,² and Katarina Westling³



— Incidents per 100 000
..... 30 Days Mortality (%)

Clinical Presentation, Etiology, and Outcome of Infective Endocarditis in the 21st Century

The International Collaboration on Endocarditis–Prospective Cohort Study

Table 4. Microbiologic Etiology by Region in 2781 Patients With Definite Endocarditis

Cause of Endocarditis	No. (%) of Patients ^a						<i>P</i> Value for the Difference Between Regions
	Total Cohort (N=2781)	Patients Admitted Directly to Study Sites Only ^b (n=1558)	Region				
			North America (n=597)	South America (n=254)	Europe (n=1213)	Other (n=717)	
<i>Staphylococcus aureus</i>	869 (31)	487 (31)	256 (43)	43 (17)	339 (28)	231 (32)	<.001
Coagulase-negative staphylococcus	304 (11)	161 (10)	69 (12)	18 (7)	156 (13)	61 (9)	.005
Viridans group streptococci	483 (17)	288 (19)	54 (9)	66 (26)	198 (16)	165 (23)	<.001
<i>Streptococcus bovis</i>	165 (6)	101 (7)	9 (2)	17 (7)	116 (10)	23 (3)	<.001
Other streptococci	162 (6)	101 (7)	38 (6)	16 (6)	66 (5)	42 (6)	.86
<i>Enterococcus</i> species	283 (10)	158 (10)	78 (13)	21 (8)	111 (9)	73 (10)	.05
HACEK	44 (2)	26 (2)	2 (0.3)	6 (2)	19 (2)	17 (2)	.02
Fungi/yeast	45 (2)	25 (2)	20 (3)	3 (1)	13 (1)	9 (1)	.002
Polymicrobial	28 (1)	23 (2)	8 (1)	1 (0.4)	13 (1)	6 (0.8)	.60
Negative culture findings	277 (10)	122 (8)	41 (7)	51 (20)	123 (10)	62 (9)	<.001
Other	121 (4)	66 (4)	22 (4)	12 (5)	59 (5)	28 (4)	.61

Abbreviation: HACEK, bacteria consisting of *Haemophilus* species, *Aggregatibacter* (formerly *Actinobacillus*) *actinomycetemcomitans*, *Cardiobacterium hominis*, *Eikenella corrodens*, and *Kingella* species.

^aOnly percentages less than 1% are carried to the first decimal place.

^bExcludes patients transferred to study hospitals from other health care facilities.

Arch Intern Med. 2009;169(5):463-473



Infective endocarditis in Turkey: aetiology, clinical features, and analysis of risk factors for mortality in 325 cases

Serap Şimşek-Yavuz^{a,*}, Ayfer Şensoy^b, Hulya Kaşıkçıoğlu^c, Sabahat Çeken^b, Deneş Deniz^b, Atilla Yavuz^d, Funda Koçak^e, Kenan Midilli^f, Mehmet Eren^c, İbrahim Yekeler^g

Objective: In order to define the current characteristics of infective endocarditis (IE) in Turkey, we evaluated IE cases over a 14-year period in a tertiary referral hospital.

Methods: All adult patients who were hospitalized in our hospital with a diagnosis of IE between 2000 and 2013 were included in the study. Modified Duke criteria were used for diagnosis. The Chi-square test, Student's *t*-test, Mann–Whitney *U*-test, Cox and logistic regression analysis were used for the statistical analysis.

Results: There were 325 IE cases during the study period. The mean age of the patients was 47 years. Causative microorganisms were identified in 253 patients (77.8%) and included staphylococci (36%), streptococci (19%), enterococci (7%), and *Brucella spp* (5%). A streptococcal aetiology was associated with younger age (<40 years) ($p = 0.001$), underlying chronic rheumatic heart disease (CRHD) (odds ratio (OR) 3.89) or a congenital heart defect (OR 4.04), community acquisition (OR 17.93), and native valve (OR 3.68). A staphylococcal aetiology was associated with healthcare acquisition (OR 2.26) or pacemaker lead-associated endocarditis (OR 6.63) and an admission creatinine level of >1.2 mg/dl (OR 2.15). Older age (>50 year) (OR 3.93), patients with perivalvular abscess (OR 9.18), being on dialysis (OR 6.22), and late prosthetic valve endocarditis (OR 3.15) were independent risk factors for enterococcal IE. Independent risk factors for mortality in IE cases were the following: being on dialysis (hazard ratio (HR) 4.13), presence of coronary artery heart disease (HR 2.09), central nervous system emboli (HR 2.33), and congestive heart failure (HR 2.15). Higher haemoglobin (HR 0.87) and platelet (HR 0.996) levels and surgical interventions for IE (HR 0.33) were found to be protective factors against mortality.

Türkiye’de İE

A multicenter study on experience of 13 tertiary hospitals in Turkey in patients with infective endocarditis

Türkiye’de 13, üçüncü basamak hastanenin katıldığı çok merkezli enfektif endokardit çalışması

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(Anadolu Kardiyol Derg 2013; 13: 523-7)

Table 4. Distribution of causative microorganisms isolated from blood cultures in patients with infective endocarditis

Organism	Number of patients (%)
Staphylococci	73 (29)
<i>Staphylococcus aureus</i>	53 (21)
MRSA	15
MSSA	11
Coagulase-negative	16 (6)
<i>Staphylococcus epidermidis</i>	4 (2)
Enterococcus	28 (11)
Streptococci	27 (11)
<i>Viridans streptococci</i>	22
<i>Streptococcus bovis</i>	1
Other streptococcal species	4
Gram-negative organisms	25 (10)
<i>Brucella</i>	12 (5)
<i>P. aeruginosa</i>	3
<i>E. coli</i>	4 (2)
HACEK group	5
Klebsiella spp.	1
<i>Candida albicans</i>	2
No growth on culture	93 (37.5)
Total	248
MRSA - methicillin-resistant <i>S. aureus</i> , MSSA - methicillin-sensitive <i>S. aureus</i>	

İE değişimler !

- Epidemiyoloji değişiyor:
 - * S.aureus (Özellikle gelişmiş ülkelerde)
 - * Altta yatan hastalık olmadan İE artıyor
 - * İleri yaşlarda İE
 - * Cerrahi tedavi gereken hasta artıyor (% 50)
 - * Klinik yansımalar çeşitleniyor

AHA Scientific Statement

Infective Endocarditis in Adults: Diagnosis, Antimicrobial Therapy, and Management of Complications

A Scientific Statement for Healthcare Professionals From the American Heart Association

İE değişimler !

- Tanı yaklaşımı geliyor:
 - * Moleküler temelli tanı (PCR)
 - * Radyolojik yaklaşım (MR, CT, 3D EKO)
 - * Nükleer tıp yaklaşımları
- Tedavi : Daptomisin!

AHA Scientific Statement

Infective Endocarditis in Adults: Diagnosis, Antimicrobial Therapy, and Management of Complications

A Scientific Statement for Healthcare Professionals From the American Heart Association

İE değişmeyenler!

- Temel tanı yaklaşımı hemokültür!
- Modifiye Duke kriterleri !
- Tedavi yönlendirilmesinde etken ve antibiyotik duyarlılık testleri belirleyici!

Penisilin MIC ile doz

Vankomisin MIC artışı

İE Tanı: Modifiye Duke

Major criteria

Blood culture positive for IE

Typical microorganisms consistent with IE from 2 separate blood cultures: Viridans streptococci, *Streptococcus bovis*, HACEK group, ***Staphylococcus aureus***; or community-acquired enterococci in the absence of a primary focus, or microorganisms consistent with IE from persistently positive blood cultures defined as follows: at least 2 positive cultures of blood samples drawn >12 h apart or all 3 or a majority of ≥ 4 separate cultures of blood (with first and last sample drawn at least 1 h apart)

Single positive blood culture for *Coxiella burnetii* or anti-phase 1 IgG antibody titer $\geq 1:800$

Evidence of endocardial involvement

Echocardiogram positive for IE (**TEE recommended for prosthetic valves, rated at least possible IE by clinic complicated IE [paravalvular abscess]; TTE as first for nonprosthetic patients**) defined as follows: oscillating intracardiac mass, abscess, or other supporting structures, in the path of regurgitant jets, or new valvular regurgitation or new partial dehiscence of prosthetic valve or new valvular regurgitation (worsening or changing or pre-existing murmur not sufficient)

S.aureus!

Minor criteria

Predisposition, predisposing heart condition, or IDU

Fever, temperature $>38^{\circ}\text{C}$

Vascular phenomena, major arterial emboli, septic pulmonary infarcts, mycotic aneurysm, intracranial hemorrhage, conjunctival hemorrhages, and Janeway lesions

Immunological phenomena: glomerulonephritis, Osler nodes, Roth spots, and rheumatoid factor

Microbiological evidence: positive blood culture but does not meet a major criterion as noted above (excludes single positive cultures for coagulase-negative staphylococci and organisms that do not cause endocarditis) or serological evidence of active infection with organism consistent with IE

Endokardit tanısında HK

AHA Scientific Statement

Infective Endocarditis in Adults: Diagnosis, Antimicrobial Therapy, and Management of Complications
A Scientific Statement for Healthcare Professionals From the American Heart Association

Recommendations

1. **At least 3 sets of blood cultures obtained from different venipuncture sites should be obtained, with the first and last samples drawn at least 1 hour apart (*Class I; Level of Evidence A*).**
2. **Echocardiography should be performed expeditiously in patients suspected of having IE (*Class I; Level of Evidence A*).**

Endokardit tanısında HK

- En az üç set, farklı venlerden ilk ve son set arasında en az 1 saat aralık olmasına dikkat ederek (AHA, ESC)
- Akut endokardit? Bir saat içinde 2 set HK
Subakut/kronik endokardit ? En az altı saat içinde üç set (BSAC)

Hemokültür

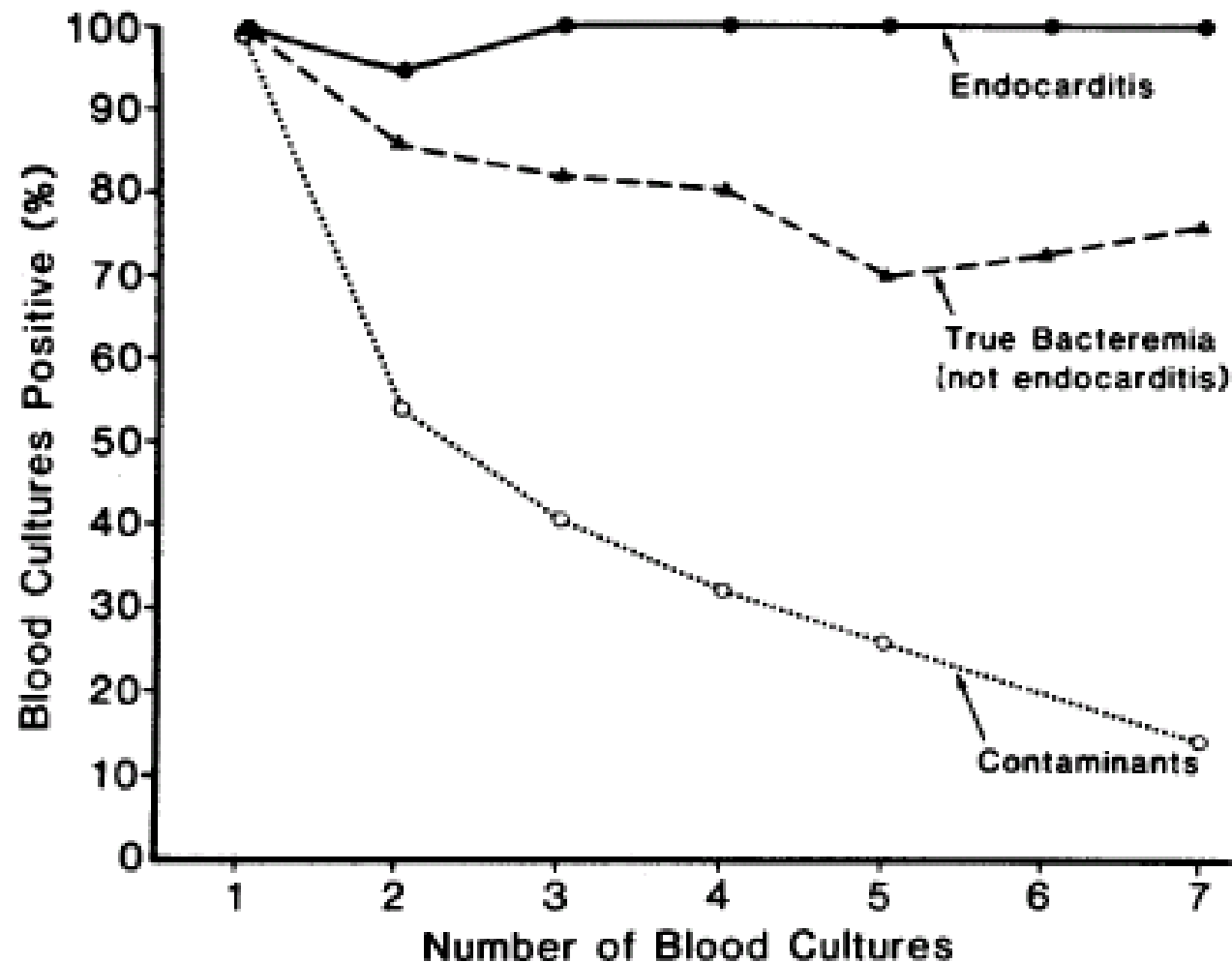


FIG. 1. Patterns of positivity in successive blood cultures, showing evidence of the diagnostic importance of separate cultures. Reprinted from reference 199 with permission of the publisher.

Guidelines for the diagnosis, prevention and management of implantable cardiac electronic device infection. Report of a joint Working Party project on behalf of the British Society for Antimicrobial Chemotherapy (BSAC, host organization), British Heart Rhythm Society (BHRS), British Cardiovascular Society (BCS), British Heart Valve Society (BHVS) and British Society for Echocardiography (BSE)

7.1 Which samples should be collected to establish the cause of ICED infection?

Summary:

- Appropriate microbiological samples include: culture of blood, lead fragments (ideally distal and proximal), lead vegetation, generator pocket tissue and pus from a generator pocket wound.

7.2 When should blood cultures be taken?

Summary:

- Recommendation 7.2.1: Blood cultures should be taken prior to starting antimicrobial therapy. [B]
- Recommendation 7.2.2: On clinical suspicion of ICED infection in patients with a chronic or subacute presentation, three sets of aseptically collected, optimally filled blood cultures should be taken from peripheral sites with ≥ 6 h between them. [C]
- Recommendation 7.2.3: To avoid undue delay in patients with suspected ICED and severe sepsis or septic shock at the time of presentation, two sets of optimally filled blood cultures should ideally be taken at different times within 1 h and prior to commencement of empirical antimicrobial therapy. [C]
- Recommendation 7.2.4: Blood cultures should be taken 48–72 h after removal of an infected ICED. [C]
- Recommendation 7.2.5: Apply meticulous aseptic technique when taking blood cultures to reduce the risk of contamination with skin commensals. [B]

IDSA/ASM Rehber

IDSA GUIDELINES

A Guide to Utilization of the Microbiology Laboratory for Diagnosis of Infectious Diseases: 2013 Recommendations by the Infectious Diseases Society of America (IDSA) and the American Society for Microbiology (ASM)^a

Ellen Jo Baron,^{1,2} J. Michael Miller,³ Melvin P. Weinstein,⁴ Sandra S. Richter,⁵ Peter H. Gilligan,⁶ Richard B. Thomson Jr.,⁷ Paul Bourbeau,⁸ Karen C. Carroll,⁹ Sue C. Kehl,¹⁰ W. Michael Dunne,¹¹ Barbara Robinson-Dunn,¹² Joseph D. Schwartzman,¹³ Kimberle C. Chapin,¹⁴ James W. Snyder,¹⁵ Betty A. Forbes,¹⁶ Robin Patel,¹⁷ Jon E. Rosenblatt,¹⁷ and Bobbi S. Pritt¹⁷

Hemokültür

Table I-1. Blood Culture Laboratory Diagnosis Organized by Etiologic Agent

Etiologic Agents	Diagnostic Procedures	Optimum Specimen	Transport Issues
<i>Staphylococcus</i> spp <i>Streptococcus</i> spp, <i>Enterococcus</i> spp <i>Listeria monocytogenes</i> <i>Enterobacteriaceae</i> <i>Pseudomonas</i> spp <i>Acinetobacter</i> spp	Adults: 2–4 blood culture sets per septic episode	20–30 mL of blood per culture set in adults injected into at least 2 blood culture bottles ^a	Inoculated culture vials should be transported to the Laboratory as soon as possible (ASAP) at RT, organisms will usually survive in inoculated culture vials even if not incubated immediately
HACEK ^c bacteria <i>Brucella</i> spp Anaerobic bacteria	2 or more blood culture sets	Blood volume depends on the child's weight (see Table in footnote 3) ^b	

cultured (see Table I-1a for recommended volumes). A second important determinant is the number of blood culture sets performed during a given septic episode. Generally, in adults with a suspicion of BSI, 2–4 blood culture sets should be obtained in the evaluation of each septic episode [5, 7].

Doğru HK ?

- Etkeni saptamak:
Volüm!
ANTİBİYOTİK !!!
- Kontaminasyon!!!



Kan kltr seti

- Bir giriřim ile alınan ve iki řiřeye aktarılan kan
 - Her řiřeye 10 ml !!!
 - řiřelerden biri aerop/biri anaerop!
- *** Anaerobik řiřeler pnmokok gibi bazı bakteriler iin daha iyi reme olanađı sađlar



Kan kültürü : zamanlama

- Ateş en yüksek seviyede ?
- Titreme aşamasında ?
- * Pediatrik çalışmalar ateşin önemli olmadığını gösteriyor!

[Pediatr Infect Dis J. 2016 Aug;35\(8\):846-50. doi: 10.1097/INF.0000000000001189.](#)

Diagnostic Yield of Timing Blood Culture Collection Relative to Fever.

[Kee PP¹](#), [Chinnappan M](#), [Nair A](#), [Yeak D](#), [Chen A](#), [Starr M](#), [Daley AJ](#), [Cheng AC](#), [Burgner D](#).

İE tanısında ateşten bağımsız en az 1 saat aralıklı (devamlı bakteriyemi ?), akut olgularda en kısa zaman diliminde !!!

Hemokültür

- Volüm kritik öneme sahiptir! (10 ml)
- HK antibiyotik öncesi alınmalıdır
- Sadece kateterden alınan HK kontaminasyon yönünden risklidir
- Kateter ucu HK yokluğunda anlamlı olmaz
- Arter kanı daha iyi bir seçenek ? Değil.

HK-Cilt antiseptisi ?

Int J Nurs Stud. 2016 Jul;59:156-62. doi: 10.1016/j.ijnurstu.2016.04.004. Epub 2016 Apr 25.

Skin antiseptics in venous puncture site disinfection for preventing blood culture contamination: A Bayesian network meta-analysis of randomized controlled trials.

Liu W¹, Duan Y², Cui W¹, Li L¹, Wang X¹, Dai H¹, You C¹, Chen M³.

 Author information

Abstract

OBJECTIVE: To compare the efficacy of several antiseptics in decreasing the blood culture contamination rate.

DESIGN: Network meta-analysis.

DATA SOURCE: Electronic searches of PubMed and Embase were conducted up to November 2015. Only randomized controlled trials or quasi-randomized controlled trials were eligible. We applied no language restriction. A comprehensive review of articles in the reference lists was also accomplished for possible relevant studies.

REVIEW METHODS: Relevant studies evaluating efficacy of different antiseptics in venous puncture site for decreasing the blood culture contamination rate were included. The data were extracted from the included randomized controlled trials by two authors independently. The risk of bias was evaluated using Detsky scale by two authors independently. We used WinBUGS1.43 software and statistic model described by Chaimani to perform this network meta-analysis. Then graphs of statistical results of WinBUGS1.43 software were generated using 'networkplot', 'ifplot', 'netfunnel' and 'sucra' procedure by STATA13.0. Odds ratio and 95% confidence intervals were assessed for dichotomous data. A probability of p less than 0.05 was considered to be statistically significant. Compared with ordinary meta-analyses, this network meta-analysis offered hierarchies for the efficacy of different antiseptics in decreasing the blood culture contamination rate.

RESULTS: Seven randomized controlled trials involving 34,408 blood samples were eligible for the meta-analysis. No significant difference was found in blood culture contamination rate among different antiseptics. No significant difference was found between non-alcoholic antiseptics and alcoholic antiseptics, alcoholic chlorhexidine and povidone iodine, chlorhexidine and iodine compounds, povidone iodine and iodine tincture in this aspect, respectively.

CONCLUSIONS: Different antiseptics may not affect the blood culture contamination rate. Different intervals between the skin disinfection and the venous puncture, the different settings (emergency room, medical wards, and intensive care units) and the performance of the phlebotomy may affect the blood culture contamination rate.

HK-Cilt antisepsisi

- Rehber önerileri (KLİMUD):

Önce alkol (% 70 izopropil) ile temizlik, iyot tentürü ya da klorheksidin ile antisepsi. Kuruma beklendikten sonra işlem!

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Ellen Jo Baron,^{1,2} J. Michael Miller,² Melvin P. Weinstein,⁴ Sandra S. Richter,² Peter H. Gilligan,⁶ Richard B. Thomson Jr.,⁷
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Kimberle C. Chapin,¹⁴ James W. Snyder,¹⁵ Betty A. Forbes,¹⁶ Robin Patel,¹⁷ Jon E. Rosenblatt,¹⁷ and Bobbi S. Pritt¹⁸

Klorheksidin ve iyot tentürü (%2) en ideal antiseptiktir. (2 ay altında çocuklarda riskli)

HK- Kanın şişeye inokülasyonu

- Şişenin enjeksiyon bölgesindeki kapak kısmı dezenfekte edilir!
 - * Tercihen alkol ya da KH (iyot önerilmez)
- Şişelere enjekte edilirken iğne ucu değiştirilmez! (Yaralanma riski! Yararı???)

HK- Özel sistem



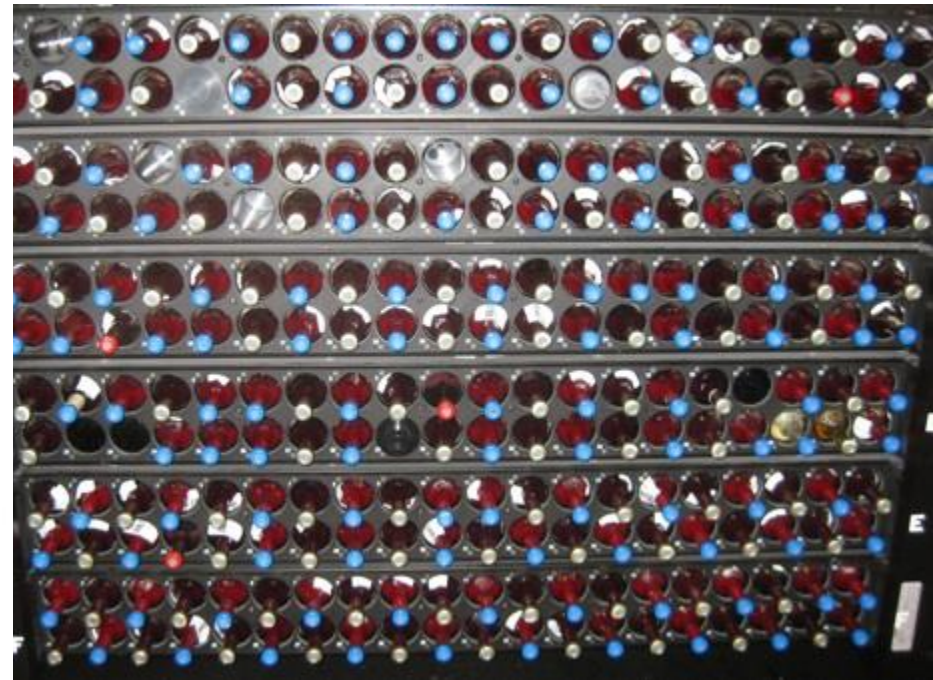
HK-laboratuvara doğru...

- Şişeler en kısa zamanda cihaza ulaşmalı ve değerlendirmeye alınmalıdır!
- HK şişeleri oda ısısında saklanmalıdır !
- Kan alınan şişeler asla etüve ya da buzdolabına konulmamalı ve oda ısısında saklanmalıdır !
- Laboratuvara ulaşan bilgi yeterli olmalı örnek «saygılı» olmalıdır!

Yeterli Bilgi – Saygılı Örnek



HK-laboratuvarda



HK-laboratuvarı

- Yeni sistemlerde 5 gün inkübasyon yeterli!
- Brucella dahil uzamış inkübasyon gerekli değil!
- HACEK/AACEK için besiyeri uygun
- Abiotrophia/Granulicatella ürer
(pasajda dikkat!)
- Candida için uygun!
- Propionibacterium (Cutibacterium) acnes bazen 14 gün inkübasyon gerektirebilir!
- HK sinyal vermese de katı besiyerine kültür ?
(CLSI önerilir! BSAC gereksiz !)

Kültür negatif İE (%2-%40)

- Antibiyotik kullanımı nedeniyle !!!
- Kültürde üretilemeyen etkenler:

C.burnetii

Bartonella

T. whipplei

Mycoplasma

Chlamydia/Chlamydophilia

Antibiyotik nedeniyle kültür negatif

- AB reçine sistemleri bir miktar faydalı
- Mümkünse antibiyotik kesilerek bir süre sonra kültür tekrarlanır.
- Süre : antibiyotik, tedavi süresi, etken ile bağlantılı
- 7- 10 gün antibiyotiksiz süre sonrası HK

Gerçek kültür negatif endokardit?

<i>Bartonella</i> spp	2 or more lysis- centrifugation (Isolator) blood culture vials ^d	10 mL of blood should be inoculated directly into each lysis- centrifugation culture vial	Lysis-centrifugation culture vials should be transported at RT to the laboratory ASAP and processed within 8 h of blood inoculation
	NAAT	5 mL of plasma	EDTA tube, RT, 2 h
<i>Legionella</i> spp	2 or more lysis- centrifugation (Isolator) blood culture vials ^e	10 mL of blood should be inoculated directly into each lysis- centrifugation culture vial	Lysis-centrifugation culture vials should be transported at RT to the laboratory ASAP and processed within 8 h of blood inoculation
	<i>Legionella</i> urine antigen test (for serotype 1)	10 mL of mid-stream, clean-catch urine ^f	Closed container, RT, 2 h
<i>Coxiella burnetii</i>	Coxiella IFA serology	5 mL of serum	Clot tube, RT, 2 h
	NAAT	5 mL of plasma	EDTA tube, RT, 2 h
<i>Tropheryma whippelii</i>	NAAT	5 mL of plasma	EDTA tube, RT, 2 h
Yeast	Adults: 2–4 blood culture sets (see above)	20–30 mL of blood per culture in adults injected into at least 2 blood culture bottles ^g	Inoculated culture vials should be transported ASAP at RT to the laboratory for early incubation
	Infants and children: 2 or more blood culture sets (see above)	As much blood as can be conveniently obtained from children; volume depends on weight of child (see following table) ^b	Organisms will usually survive in inoculated culture vials even if not incubated immediately. <i>Malassezia</i> spp require lipid supplementation; lysis-centrifugation is recommended for their recovery.
Filamentous and dimorphic fungi ^h	2 or more lysis- centrifugation (Isolator) blood culture vials	10 mL of blood should be inoculated directly into each lysis- centrifugation culture vial	Lysis-centrifugation culture vials should be transported to the laboratory ASAP and processed within 8 h of blood inoculation
Mycobacteria	3 cultures using AFB-specific blood culture bottles	5 mL of blood inoculated directly into AFB-specific blood culture bottle	Inoculated culture vials should be transported to the laboratory ASAP for early incubation

Abbreviations: AFB, acid fast bacillus; IFA, indirect fluorescent antibody; NAAT, nucleic acid amplification test; RT, room temperature.

^a Typically, blood specimens are split between aerobic and anaerobic blood culture bottles. There may be circumstances in which it is prudent to omit the anaerobic

Yeni tanı yaklaşımları

- MALDI-TOF
 - FISH
 - PCR temelli hızlı tanı sistemleri
- Hızlı, geniş spektrumlu, özgül, duyarlı...

Ekonomik?

Standartizasyon ?

RESEARCH ARTICLE

Open Access



Development and evaluation of a novel fast broad-range 16S ribosomal DNA PCR and sequencing assay for diagnosis of bacterial infective endocarditis: multi-year experience in a large Canadian healthcare zone and a literature review

Robert J. H. Miller¹, Barbara Chow², Dylan Pillai³ and Deirdre Church^{3*}

Table 3 Performance of Gram stain and bacterial culture of heart valve tissue compared to 16S broad range PCR/sequencing for diagnosis of endocarditis

Method	Sensitivity	Specificity	PPV	NPV	Diagnostic efficiency
Gram Stain of Heart Valve Tissue	26.0 % (15.1–40.6)	100 % (78.1–100.0)	100 % (71.7–100.0)	32.7 % (21.0–46.8)	45.6 % (33.8–57.4)
Heart Valve Tissue Culture	46 % (33.0–59.6)	100.0 % (83.1–100.0)	100.0 % (83.1–100.0)	41.3 % (27.0–56.7)	60.2 % (50.8–68.0)
16S Broad Range PCR/Sequencing	92.0 % (84.6–96.5)	77.8 % (57.4–90.4)	92.0 % (84.6–96.5)	77.8 % (57.4–90.4)	88.2 % (77.4–94.9)

Diagnostic performance of tissue culture and 16S Broad Range PCR sequencing in 68 samples (i.e. 50 cases had Definite IE, 8 cases had Possible IE, and 10 Cases were controls with no clinical or laboratory evidence of IE). Calculations are based on a definite diagnosis of endocarditis by the Duke's criteria as the gold standard for diagnosis. 95 % CI in brackets. PPV positive predictive value, NPV negative predictive value

Conclusions: This novel fast broad-range 16S rDNA PCR/sequencing test had superior sensitivity compared to tissue Gram stain and culture for identifying underlying bacterial pathogen in both native and prosthetic valve endocarditis.

ORIGINAL ARTICLE

Infective endocarditis: does a new 16S rDNA set of primers improve the microbiological diagnosis?

RÉMI LE GUERN, CAROLINE LOÏEZ, SYLVIE ARMAND, LAURE MARCEAU,
RENÉ COURCOL & FRÉDÉRIC WALLET

900 R. Le Guern et al.

Table III. Patients with culture-negative endocarditis.

Patient no.	PCR	91E/13BS	341F/785R	Antibiotics	Comment
13	Positive	<i>S. oralis</i> / <i>S. pneumoniae</i>	<i>S. oralis</i> / <i>S. pneumoniae</i>	Yes: AMC, GEN, VAN, TF	Wide spectrum antimicrobial therapy
18	Positive	<i>S. epidermidis</i>	<i>S. epidermidis</i>	Yes: TZP, VAN, CAN	Wide spectrum antimicrobial therapy
45	Positive	<i>E. faecalis</i>	<i>E. faecalis</i>	Yes: C3G	Ineffective antimicrobial therapy
49	Positive	<i>S. gallolyticus</i>	<i>S. gallolyticus</i>	Yes: AMC, GEN	Adapted antimicrobial therapy
73	Positive	<i>Bartonella quintana</i>	<i>Bartonella quintana</i>	Yes: AMC, GEN, DOXY	Positive <i>Bartonella</i> serology
24	Negative			Yes: AMC	Positive <i>Bartonella</i> serology
69	Negative			Yes: AMX	

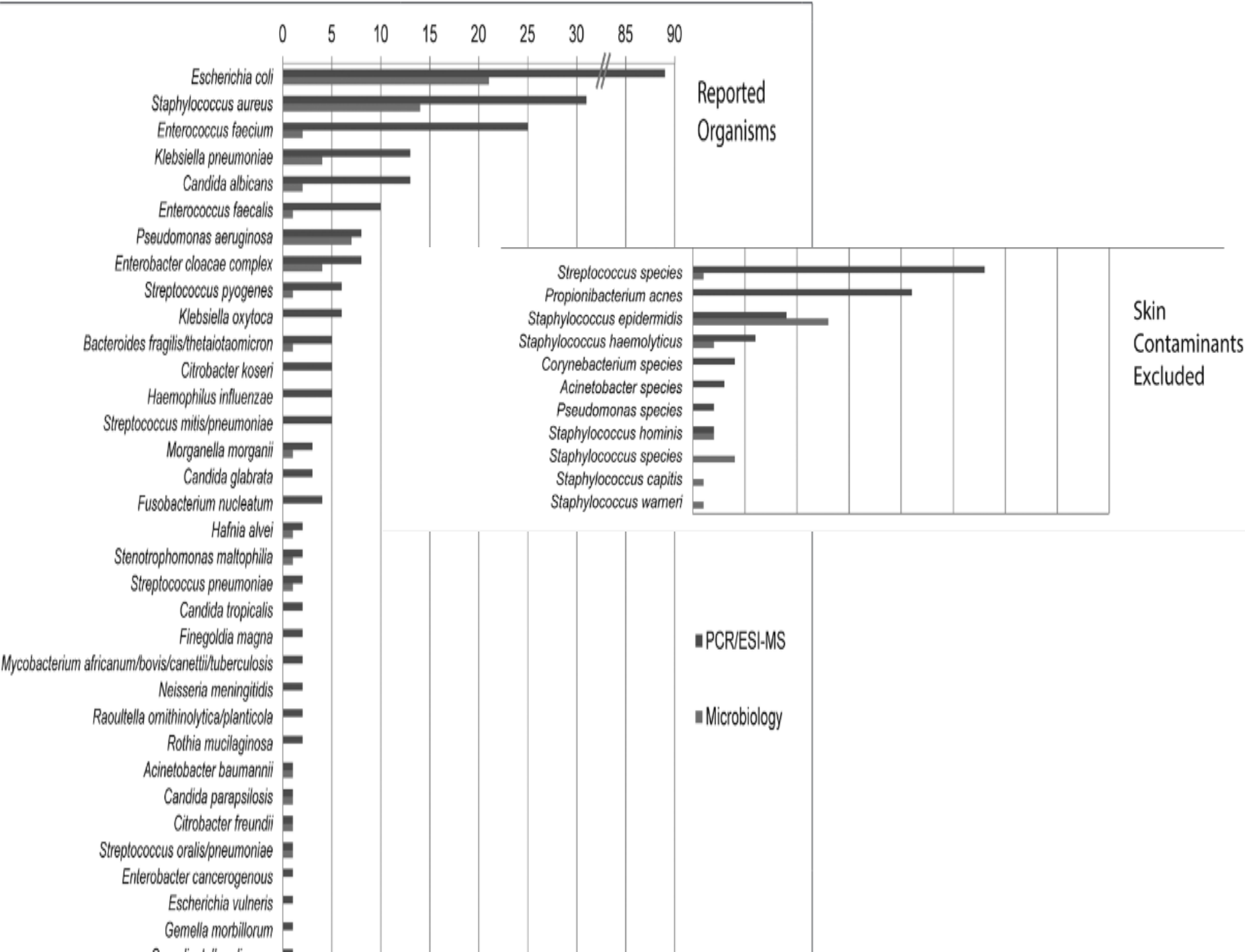
AMC, amoxicillin-clavulanic acid; AMX, amoxicillin; C3G, third-generation cephalosporin; CAN, caspofungin; DOXY, doxycycline; GEN, gentamicin; TF, fluconazole; TZP, piperacillin tazobactam; VAN, vancomycin.

Rapid Diagnosis of Infection in the Critically Ill, a Multicenter Study of Molecular Detection in Bloodstream Infections, Pneumonia, and Sterile Site Infections*

Jean-Louis Vincent, MD, PhD, FCCM¹; David Brealey, MD²; Nicolas Libert, MD³; Nour Elhouda Abidi, MD⁴; Michael O'Dwyer, MD⁵; Kai Zacharowski, MD⁶; Malgorzata Mikaszewska-Sokolewicz, MD⁷; Jacques Schrenzel, MD⁸; François Simon, MD⁹; Mark Wilks, PhD⁵; Marcus Picard-Maureau, PhD¹⁰; Donald B. Chalfin, MD, MPH¹¹; David J. Ecker, PhD¹¹; Rangarajan Sampath, PhD¹¹; Mervyn Singer, MD²; the Rapid Diagnosis of Infections in the Critically Ill Team

TABLE 2. Bloodstream Infection Assay Performance

	Culture					
		+	–	Total		
Polymerase chain reaction/ electrospray ionization-mass spectrometry	+	55	173	228	Sensitivity	81% (95% CI, 70–89%)
	–	13	384	397	Specificity	69% (95% CI, 65–73%)
					Positive predictive value	24% (95% CI, 19–30%)
	Total	68	557	625	Negative predictive value	97% (95% CI, 94–98%)

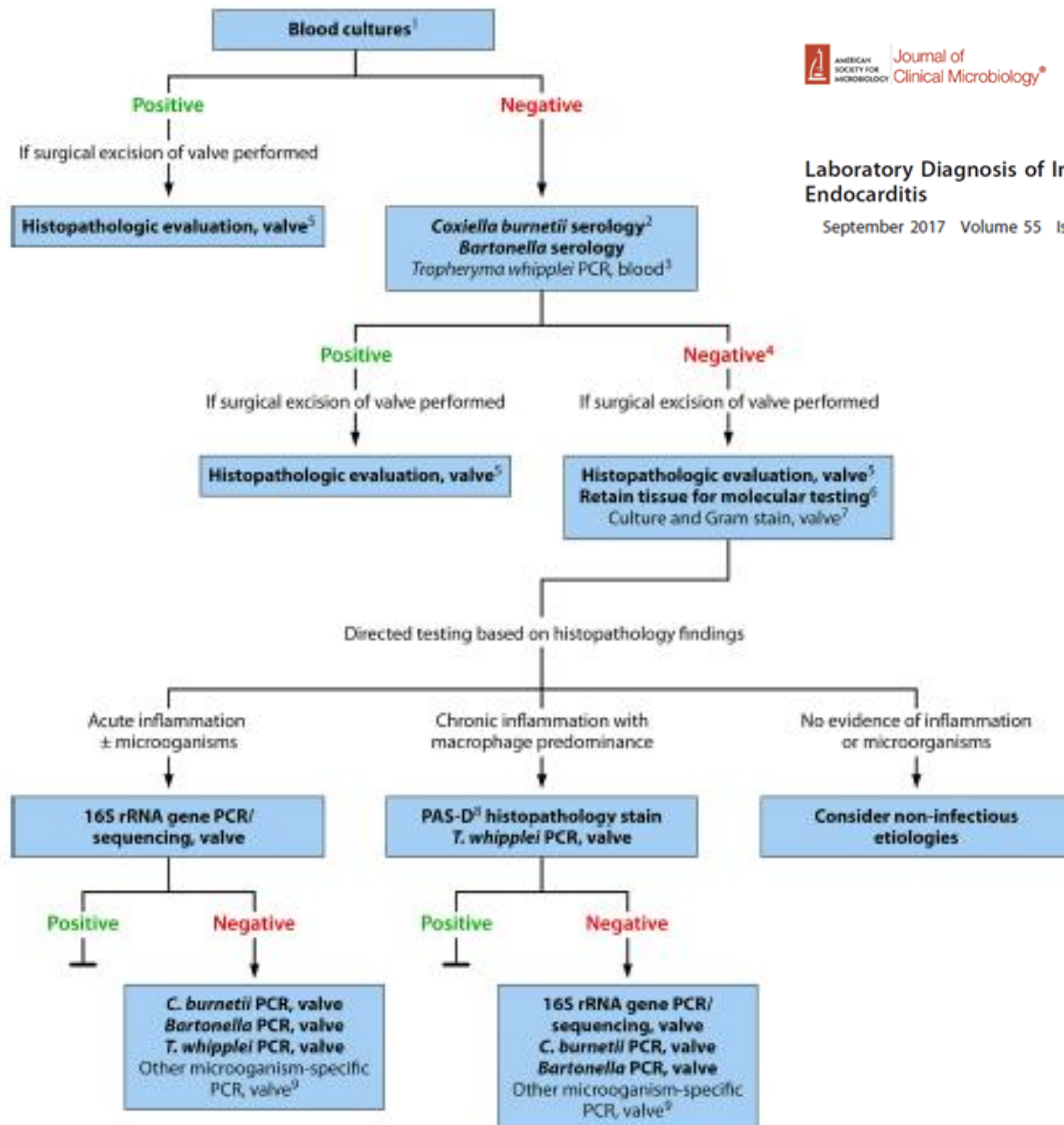


HK yerine moleküler tanı ?

- İE için çok ideal bir ilgi alanı.
- Hızla gelişiyor
- Kan ve kalp kapağı örnekleri!
- Standartizasyon?
- Özellikle direkt kan ve serumda düşük sensitivite? Kapak örneklerinde etkin yaklaşım!

Laboratory Diagnosis of Infective Endocarditis

September 2017 Volume 55 Issue 9



Kontaminasyon

- Tanım: Klinik uyumsuz! Tek şişe/set?
- CLSI en çok % 3 kontaminasyon kabul edilebilir!
- En sık kontaminasyon etkenleri:
 - * Koagülaz negatif stafilokok
 - * Viridans grubu streptokoklar
 - * Micrococcus spp.
 - * Bacillus spp
 - * Propionibacterium acnes



Review

Blood culture contaminants

S. Dawson*

- Kateterlerden örnek alma
- Antiseptide alkollü preparatlar! (KH/alkol)
- Steril eldiven ???
- İğne değişimi gereksiz
- İlk olarak HK şişesine
- Monitörizasyon
- Eğitim

Yetkin/sertifikalalı (!) laboratuvar uzman-
çalışan-örnek alan!(flebotomist)

Your Role in the Clinical Team



Sonuç

- HK infektif endokardit tanısında hala en önemli tanı ve yönetim ögesi
- HK alınması boyutunda sorunlar devam ediyor.
- İnfektif Endokardit multidisipliner çalışma alanı olarak
- HK alımında eğitilmiş kişilerin (flebotomist) etkin rol oynaması faydalı bir bakış açısı
- Moleküler tanı.... Gelecekte !

Soru-Katkı ?

- Teşekkürler !!!

