

Are incidence and epidemiology of anaerobic bacteremia really changing? An update

Vena A.¹, Alcalá L.¹, Rodríguez-Créixems M.¹, Sanchez C.¹, Valerio M.¹, Muñoz P.¹ and Bouza E.¹

¹Department of Clinical Microbiology and Infectious Diseases, Hospital General Universitario Gregorio Marañón, Madrid, Spain.

INTRODUCTION

- Traditionally, anaerobes were considered an important cause of bacteremia accounting for 1-20% of all positive blood cultures (BCs).
- More recently, conflicting data have been reported regarding trends in incidence of anaerobic bacteremia and the need to process systematically BCs in anaerobic atmosphere.
- Moreover, only a few series specifically addressed this issue in the last 10 years and fragmented and inconclusive data were obtained mainly due to the wide variability in methodology and in reporting results.

AIM

- The aim of our study was to update the trends in incidence of anaerobic bacteremia during the last ten years. We also reassessed risk factors for anaerobic mortality in a non-selected group of patients.

MATERIALS AND METHODS

- **Microbiological study:** we retrospectively analyzed all significant positive BCs for at least one anaerobic bacteria between 2003-2012. BCs were processed using BACTEC 9240 system (Becton Dickinson, Sparks, MD) from the beginning of the study to Dec 2009 and with BD Bactec FX (Becton Dickinson) from Jan 2010 onwards.
- **Clinical study:** we randomly selected 115 patients for detailed clinical data. In order to assess overall mortality predictors a retrospective cohort study design was applied. Adequate empirical antimicrobial therapy was defined as the initiation of treatment with active anti- anaerobic drugs within 24 h after BSI onset.

RESULTS

MICROBIOLOGICAL STUDY

19,021 significant episodes of bacteremia of which 711 (3.7%) were due to anaerobic bacteria.

Total episodes of BSI/1000 admissions slightly increased during the study (mean annual increase of 0.64%), but anaerobic bacteremia remained stable (overall incidence of 1.2/1000 admissions) (see Fig 1).

245 episodes (34.5%) were part of a polymicrobial bacteremia. Concomitant pathogens were Gram (-) aerobic bacteria, Gram (+) aerobic cocci and *Candida* spp in 42.4%, 22.7% and 2% of the cases, respectively.

Anaerobic species isolated in the 711 episodes (808 pathogens) are shown in Table 1. Analyzing the percentage of the different species, it did not change during the study period.

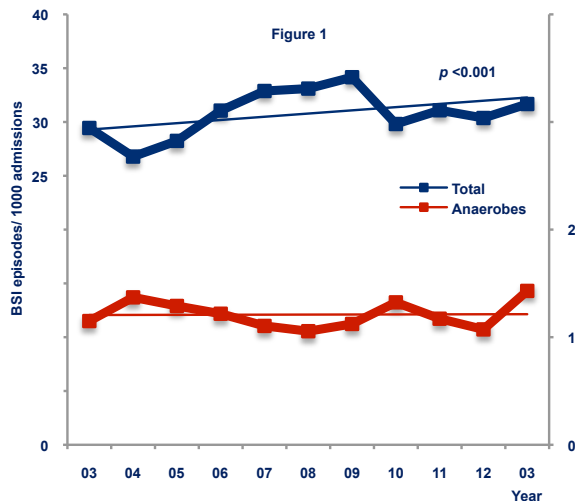


Table 1

	Total
Anaerobic gram(-) bacteria	
<i>B. fragilis</i> group	308(38.1)
Other <i>Bacteroides</i> spp	32 (3.9)
<i>Fusobacterium</i> spp	68 (8.4)
<i>Prevotella</i> spp	51 (6.3)
Other	12 (1.5)
Spore forming gram (+) bacteria	
<i>Clostridium</i> spp	111 (13.7)
<i>C. perfringens</i>	61 (7.6)
Anaerobic cocci	
<i>Peptostreptococcus</i> sp	51 (6.3)
<i>Veillonella</i> spp	23 (2.8)
<i>Gemella</i> spp	12 (1.5)
Other	15 (1.8)
No spore forming gram (+) bacteria	
<i>Lactobacillus</i> spp	21 (2.6)
<i>Propionibacterium</i> spp	19 (2.3)
<i>Actinomyces</i> spp	10 (1.2)
Other	14 (1.7)

CLINICAL STUDY

Clinical study included 113/115 patients. The underlying diseases were classified as ultimately fatal or rapidly fatal in 43.5% of the patients and almost half of them had a malignant disease (40.7% a solid tumor and 8% a hematological cancer).

The main sources of infection were the abdomen (53.1%) and skin and soft tissue (17.7%)

Twenty-eight patients (24.7%) died during hospitalizations. Independent risk factor for mortality are shown in Table 2.

Table 2

Variable	OR	(CI, 95%)	p
Charlson comorbidity index	1.3	(1.02-1.6)	0.03
Malignancies	2.1	(0.63-7.2)	0.22
Male sex	0.39	(0.13-1.2)	0.10
Adequate empirical antimicrobial therapy	1.4	(0.3-7.2)	0.67
Septic shock at presentation	6.9	(1.2-37)	0.02
Adequate source control of infection	0.24	(0.08-0.79)	0.02

CONCLUSIONS

- Our study shows that the incidence of anaerobic bacteremia during the last 10 years has not decreased.
- The high mortality rate observed is mainly related to the severity of underlying diseases and to the adequacy of source control of infection but no to the adequateness of antimicrobial therapy .
- These observations support the systematic use of anaerobic BCs in all patients with sepsis.