

# ANAEROBIC FLORA AS ETIOLOGICAL AGENTS OF ABSCESSSES OF INTERNAL ORGANS AND BODY CAVITIES IN PATIENTS HOSPITALISED IN A TERTIARY CARE UNIVERSITY-AFFILIATED HOSPITAL

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## Introduction and purpose

Anaerobic bacteria are important etiological agents of both endogenous and exogenous infections, located in different tissues and organs. Infections caused by Gram-positive and Gram-negative obligatory anaerobic flora may lead to complications, such as abscesses of internal organs and body cavities in different anatomical locations.

The aim of the study was to evaluate the profile of strictly anaerobic bacteria isolated from abscesses localized in the internal organs of patients hospitalised in a tertiary care university-affiliated hospital and to assess their susceptibility to antimicrobials.

## Material and methods

Analysis comprised of 344 samples for anaerobic cultures, obtained from the internal organ and body cavity abscesses of 296 patients in the period 01.01.2014 – 30.09.2016. Samples were cultured using standard microbiological procedures. Isolated bacteria were identified by MALDI-TOF MS system (Maldi Biotyper Microflex LT, Bruker, Germany). Antimicrobial susceptibility was determined by ATB ANA tests (bioMerieux) or antibiotic gradient strips (E-test, bioMerieux).

## Results

In total 344 clinical samples were cultured for strictly anaerobic bacteria, out of which 118 (34.3%) were positive. These samples yielded 239 isolates. The most common were samples from liver abscesses (n=86, 25.0%) and peritoneal cavity abscesses (n=86, 25.0%), followed by pancreas abscesses (n=39, 11.34%), perianal abscesses (n=37, 10.75%) and brain abscesses (n=22, 6.39%). The most commonly isolated bacteria comprised the strains of *Bacteroides fragilis* group (n=85, 35.56%), and *Fusobacterium* spp. (n=29, 12.13%). All isolates of *Fusobacterium* spp. (100.0%) were susceptible to penicillin, amoxicillin/clavulanate, clindamycin and metronidazole, in contrast to *Bacteroides fragilis* rods, characterised by the following susceptibility profile: 0%, 98.82%, 45.88%, and 100.0%, respectively.

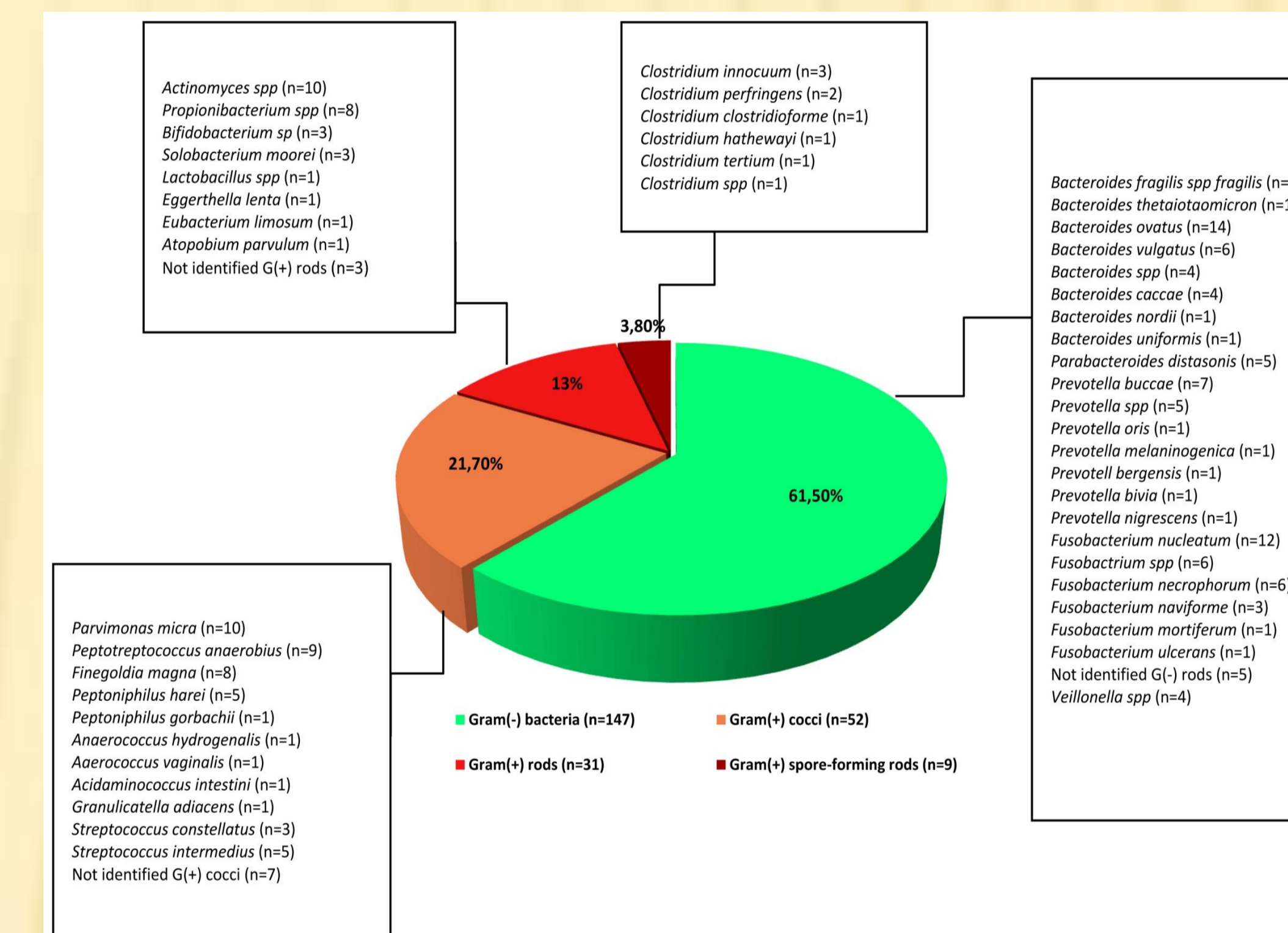


Fig. 1. Anaerobic microflora isolated from abscesses of the internal organs and body cavities in the period 2014-2016

Tab. 1. Number of abscesses of the internal organs and body cavities and their anatomical localisation in the period 2014-2016

Anatomical localisation	Number of samples	Percentage of the total number of samples	Positive culture results (n=118)	Negative culture results (n=226)	Percentage of positive culture results
Peritoneal cavity	86	25	32	54	37.2
Liver	86	25	10	76	11.6
Pancreas	39	11.3	10	29	25.6
Anorectal abscess	37	10.8	27	10	73.0
Brain	22	6.4	5	17	22.7
Appendix	20	5.8	11	9	55.0
Gallbladder	17	4.9	5	12	29.4
Intestine	13	3.8	8	5	61.5
Pelvis	6	1.7	5	1	83.3
Kidney	6	1.7	1	5	16.7
Scrotum	5	1.5	2	3	40.0
Lung/pleural cavity	5	1.5	1	2	20.0
Spleen	2	0.6	1	1	50.0
Total	344	100	118	224	

Tab. 2. Antimicrobial susceptibility of *Bacteroides fragilis* strains isolated from abscesses of the internal organs and body cavities in the period 2014-2016

	Penicillin	Amoxicillin /clavulanate	Clindamycin	Metronidazole
<i>Bacteroides fragilis</i> ssp. <i>fragilis</i> (n=39)	0	39 (100%)	17 (43.6%)	39 (100%)
<i>Bacteroides thetaiotaomicron</i> (n=17)	0	17	6	17
<i>Bacteroides ovatus</i> (n=14)	0	13	8	14
<i>Bacteroides vulgatus</i> (n=5)	0	5	0	5
<i>Bacteroides caccae</i> (n=3)	0	3	1	3
other <i>Bacteroides</i> spp. (n=7)	0	7	6	7
Total <i>Bacteroides fragilis</i> group (n=85)	0	84 (98.8%)	38 (44.7%)	85 (100%)

Tab. 3. Antimicrobial susceptibility of *Fusobacterium* spp. strains isolated from abscesses of the internal organs and body cavities in the period 2014-2016

	Penicillin	Amoxicillin /clavulanate	Clindamycin	Metronidazole
<i>Fusobacterium nucleatum</i> (n=13)	13	13	13	13
<i>Fusobacterium necrophorum</i> (n=5)	5	5	5	5
<i>Fusobacterium naviforme</i> (n=3)	3	3	3	3
other <i>Fusobacterium</i> spp. (n=8)	8	8	8	8
Total <i>Fusobacterium</i> spp. (n=29)	29 (100%)	29 (100%)	29 (100%)	29 (100%)

## Conclusions

1. In the analysed group of patients the most common complications were abscesses localised in the gastrointestinal tract, which reflects the profile of the hospital.
2. Predominance of Gram-negative anaerobic flora indicates an endogenous source of infections complicated by abscess formation.
3. A high percentage of strains susceptible to metronidazole and amoxicillin/clavulanate confirms the sustained usefulness of these antimicrobials in the therapy of infections caused by anaerobes.