

IMPACT OF BUNDLE MANAGEMENT ON MORTALITY BY S.AUREUS BSI: ANALYSIS OF THE RETROSPECTIVE PHASE

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CONTEXT

- S. aureus BSI are still an important cause of mortality (20-40%)⁴⁻⁸
- Literature recommends a bundle approach for their management¹
- The bundles are recommended to include: follow-up blood cultures, echocardiography, specific antibiotic therapy with an appropriate length and an Infectious Diseases consultation in order to reduce mortality²⁻⁸

OUR BUNDLE

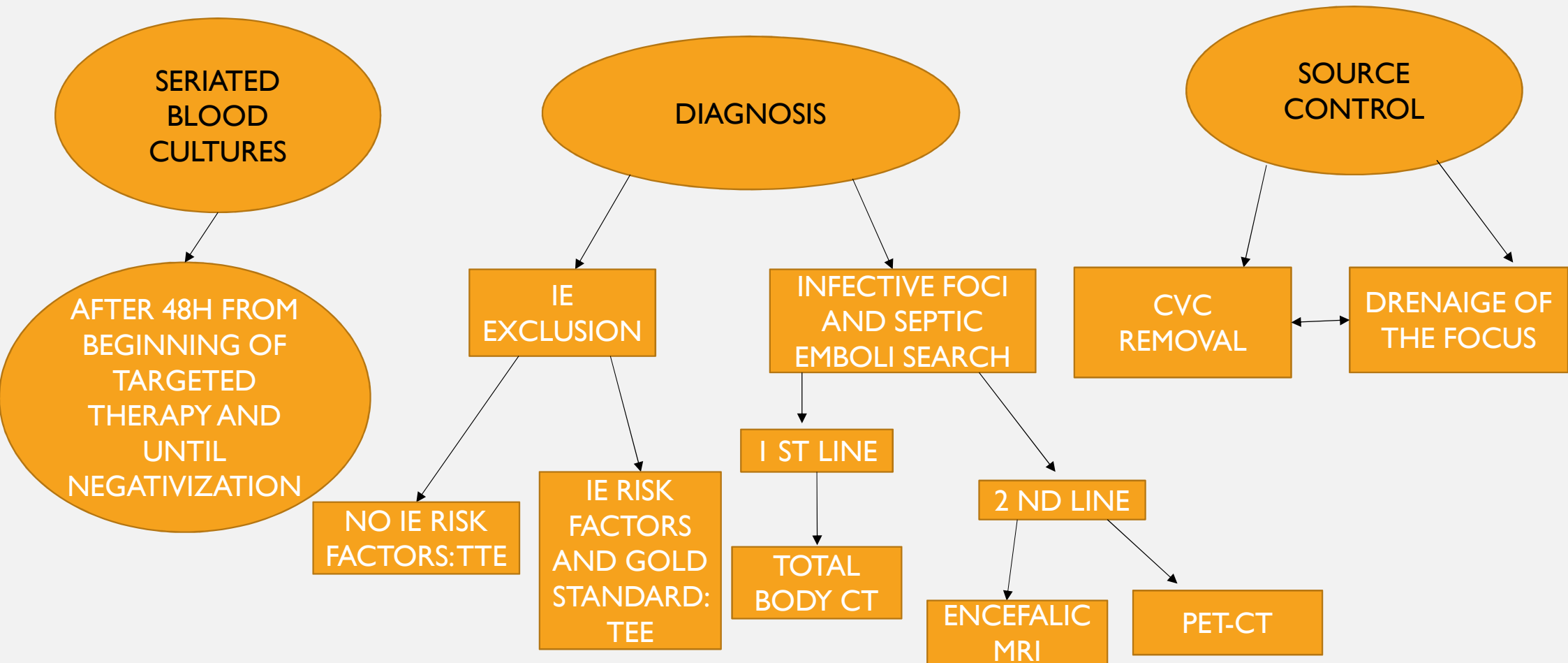
- We began to implement the usage of a bundle for the management of Gram + BSI, in particular for staphylococcus spp., enterococci spp. and streptococci spp.
- The aim is to reduce mortality, reduce hospitalization duration, reduce relapses, step up the diagnosis of complicated BSI and implement bundle adherence
- The study is divided in a retrospective branch and a prospective one, with enrollment of patients for whom the bundle will be applied
- Here are presented only the data about the retrospective phase

Prpoverei a farlo in diagrammi di flusso

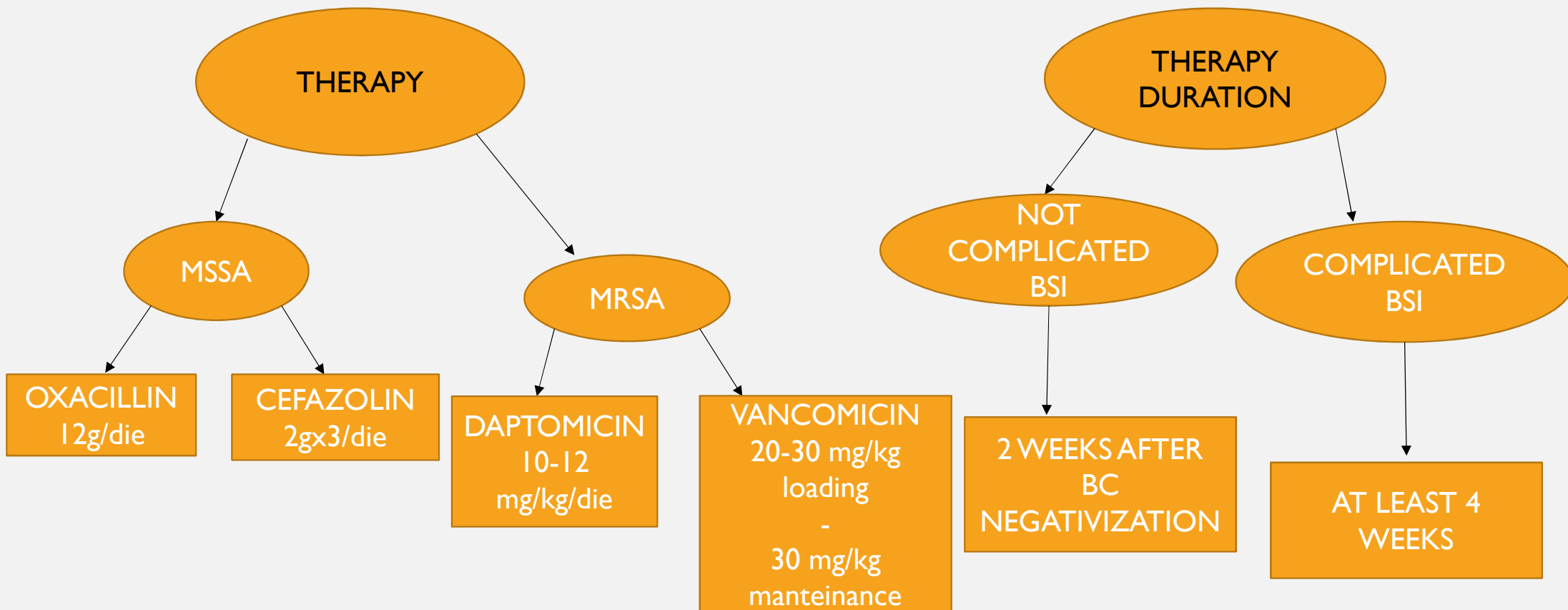
S. AUREUS BUNDLE ITEMS

- Seriated blood-cultures: every 48h until negativization
- Source control: CVC removal and/or drenaige of the focus within 72h
- Diagnosis: execution of a TEE, TTE in the absence of risk factor for IE. Infective foci research and septic emboli exclusion (total body TC scan as 1st level; encefalic RMN in suspect of IE or PET-TC as 2nd level)
- Therapy: if MSSA BSI oxacillin 12g/die or cefazolin 2gx3/die. If MRSA vancomicin with a loading dose of 20-30 mg/kg and a 30 mg/kg manteinance dose or daptomicin 10-12 mg/kg/die (using TDM and adjustment dose for vancomicin with a C through of 15-20 mg/L or 20-30 mg/L if CI)
- Therapy duration: 2 weeks after blood coltures negativization, if not complicated BSI. At least 4 weeks if complicated (i.e. 6w for PVE, 8w for osteomyelitis)

S. AUREUS BUNDLE ITEMS



S. AUREUS BUNDLE ITEMS



OBJECTIVES OF RETROSPECTIVE STUDY

- Adherence to the bundle for *S. aureus* BSI
- Impact of Infectious Diseases consultation on in-hospital mortality
- Impact of appropriated empirical antimicrobial therapy on in-hospital mortality

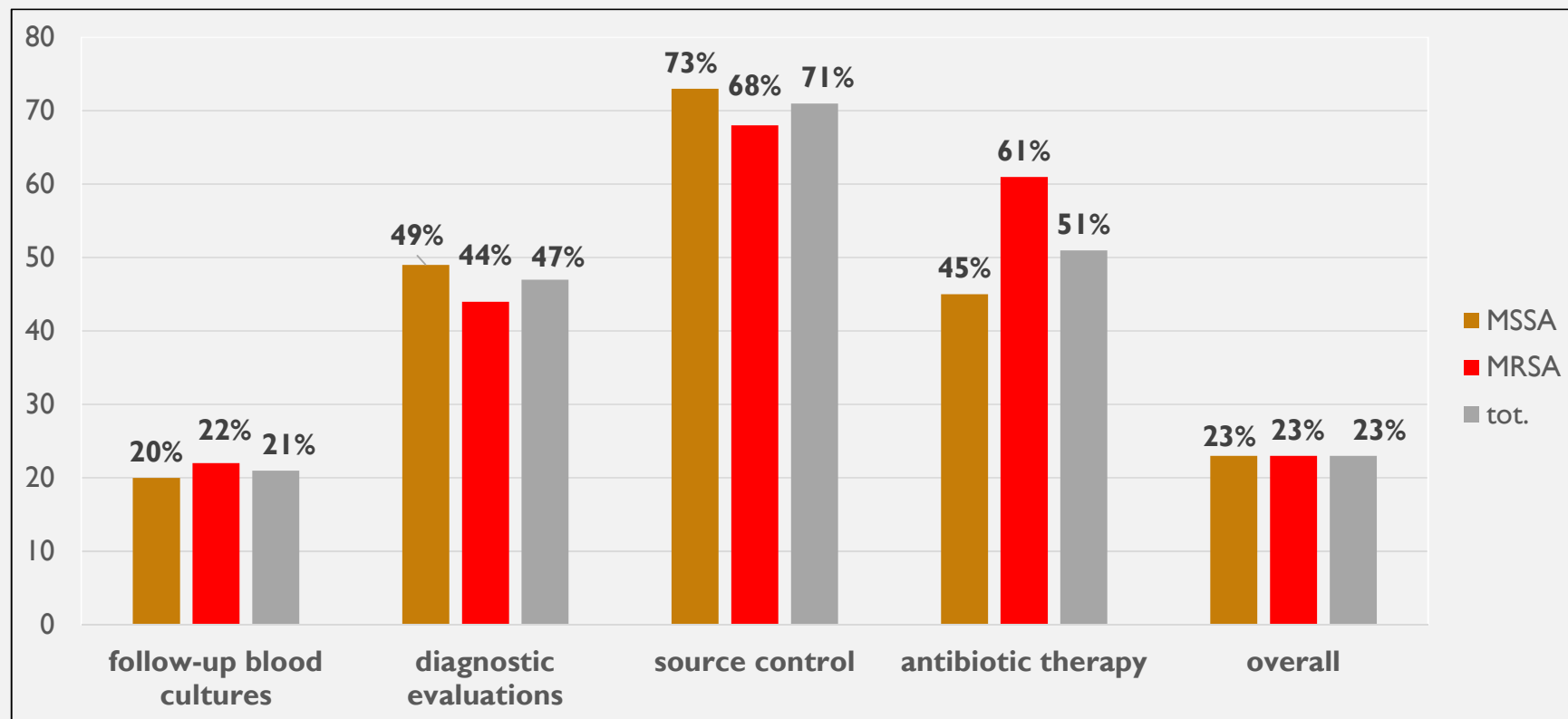
METHODS

- Analysis between 2017-2018 of *S. aureus* BSI diagnosed at San Paolo hospital, Milan
- Inclusion criteria:
 - blood cultures positive for *S. aureus* in patients with at least one sign/symptom of SIRS
 - adults >18 years old
- We collected the following data :
 - clinical characteristics (age, comorbidities by Charlson index, methicillin resistance, sepsis defined by refractory hypotension and/or organ failure)
 - adherence to the bundle diagnostic work-up, ID consultation and therapy
 - in-hospital mortality (analyzed by Kaplan-Meier)
- Possible factors associated to mortality were analyzed by uni- and multivariate Cox regression models adjusted for potential confounders

RESULTS

PATIENT'S CHARATERISTICS	MSSA	MRSA	TOT.
N. OF PATIENTS	75(64.7%)	41(35.3%)	116
MEDIAN AGE (MEDIAN, IQR)	73(62-82)	78(73-84)	77(64-82)
CHARLSON (MEDIAN, IQR)	7(5-9)	7(6-10)	7(5-10)
SEPSIS AT ONSET	31(41.3%)	23(56.1%)	54(46.5%)

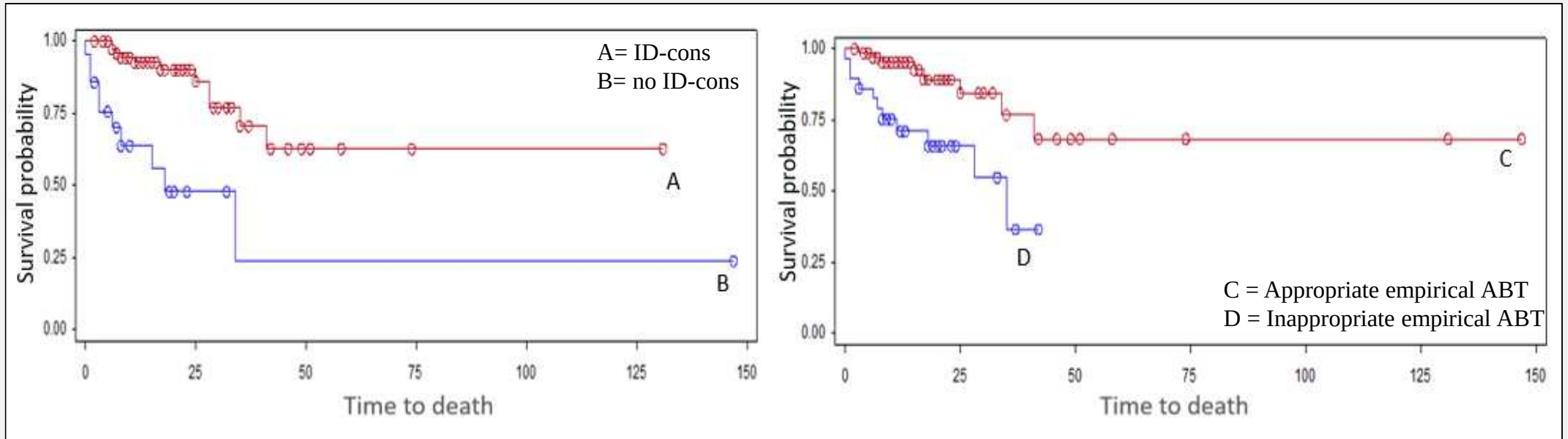
	MSSA	MRSA	tot.	P value
COMPLICATED BSI	33 (44%)	19 (46.3%)	52 (44.8%)	0.93
INFECTIOUS DISEASE CONSULTATION	56 (73.7%)	32 (78.1%)	88 (75.9%)	0.62
APPROPRIATE EMPIRICAL ANTIBIOTIC THERAPY	59 (86%)	15 (39%)	73 (69.8%)	<0.001



RESULTS

Survival analysis

At survival analysis, the 30 days-probability of in hospital mortality was of 29% (95%CI 15.7-42.3)



ID-cons was associated with a reduced 30 days-probability of mortality

ID-cons: 22% [95%CI 8-36] vs **no ID-cons 52%**
[95%CI 28-75]
p=0.002

Appropriate empirical antibiotic therapy was associated with a reduced 30 days-probability of mortality

appropriate: 15% [95%CI 3-27] vs **inappropriate 45%**
[95%CI 22-68]
p=0.002

RESULTS

UNIVARIATE AND MULTIVARIATE ANALYSIS FOR IN-HOSPITAL MORTALITY

	HR	IC 95%	p value	aHR	IC 95%	p value
ID-consultation	0.2	0.08-0.46	0.0002	0.2	0.07-0.6	0.004
Appropriate empirical ABT	0.26	0.10-0.65	0.004	0.1	0.02-0.4	0.006
MRSA	1.8	0.7-4.5	0.16	1.6	0.2-2.1	0.4
Sepsis	2.3	0.8-6.3	0.1	6.9	1.7-28	0.007
Charlson	1.2	1.1-1.4	0.0012	1.2	1.0-1.4	0.03

CONCLUSIONS

- An Infectious Diseases consultation and an appropriate empirical antibiotic therapy are independently associated with a better outcome for *S. aureus* BSI
- On the other side, a high basal Charlson score and presence of sepsis are independently associated with a worst outcome

FOR THE FUTURE

- To spread knowledge of bundle elements in our hospital departments
- Continue enrollment for the prospective phase of the study, after the pandemic blockage
- Active implementation of the bundle also for: Enterococci, Coagulase-negative Stafilococci, Streptococci
- To observe possible ecological changes for Gram+ BSI after COVID pandemic



THANKS FOR THE ATTENTION!!!

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