The PerSAB Study: risk factors associated with *S. aureus* persistent bacteremia, a preliminary analysis

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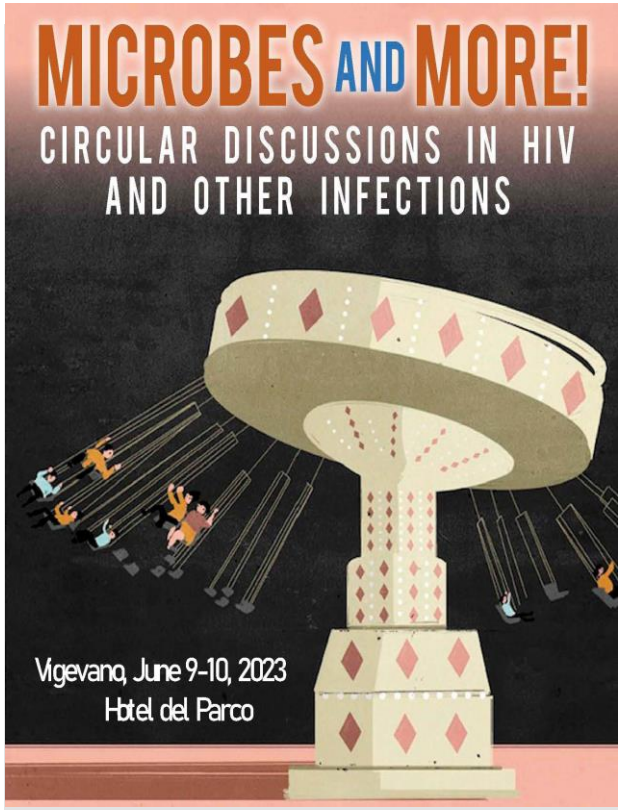

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Rational of the study

- S. aureus bacteremia (SAB) is a high mortality condition (20-40%) with a high rate of morbidity due to it's potential dissemination
- Persistent bacteremia is defined by the presence of positive follow-up blood coltures (FU-BC) after 48 hours from the start of a active antibiotic therapy, with a incidence estimated between 9 and 36%
- Mortality risk raises everyday of positive FU-BC with a cut-off of 48 hours as the limit to the higher incrementation of mortality
- Some risk factors for persistent SAB, in literature, have been identified but it's determinants are still not completely known

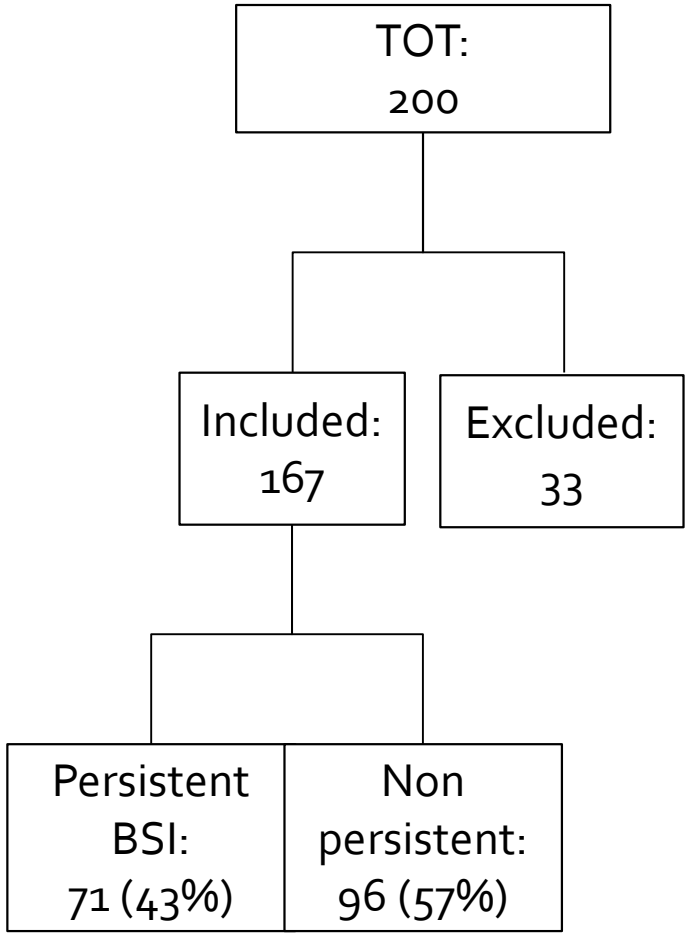
Aims

- To assess prevalence of SAB and persistent SAB
- To assess all-causes in-hospital mortality according to non-persistent and persistent SAB
- To assess risk factors associated with persistent SAB

Material and methods

- Retrospective monocentric study
- Inclusion criteria: all patients with SAB, age≥ 18 y.o.; for statistical analysis: FU-BC at 48 hours, survival at 48h from SAB onset
- All patients with SAB, from January 1st 2019 to December 31st 2021
- Collection of demographic, clinical, microbiological and of outcomes datas from hospital's digital records
- Statistical analysis (Chi square for nominal variables, Mann-Whitney or Student t test test for numerical variables and logistic regression for dicotomic numeric variables)
- Predictive factors for persistent SAB have been investigated by fitting a logistic regression analysis

Inclusion


TOT:
200
Included:
167
Excluded:
33
Persistent
BSI:
71 (43%)
Non
persistent:
96 (57%)

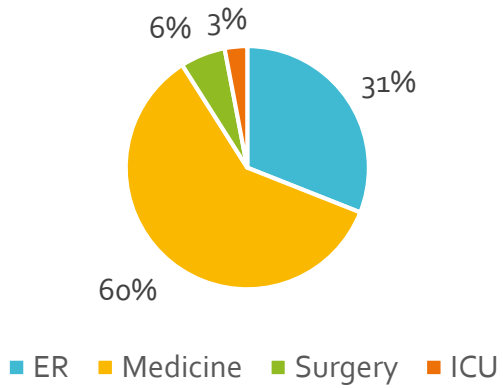
Demographic

	Overall (200)	Persistent (71)	Non persistent (96)	p
Age Median (IQR)	74 (59-83)	69 (56-80)	75 (59-82)	0.191
Gender M n (%)	119 (59.5%)	56 (58.33%)	46 (64.79%)	0.398
Hospitalization days Median (IQR)	24 (14-38)	28 (16-45)	26 (19-41)	0.349
Charlson Median (IQR)	6 (5-8)	6 (4-8)	6 (5-8)	0.897
Ward: - ER - Medicine - Surgery - ICU n (%)	 62 (31%) 120 (60%) 11 (5.5%) 7 (3.5%)	 22 (31%) 43 (61%) 4 (6%) 2 (2%)	 31 (32%) 54 (56%) 7 (7%) 4 (5%)	 0.858 0.577 0.670 0.645

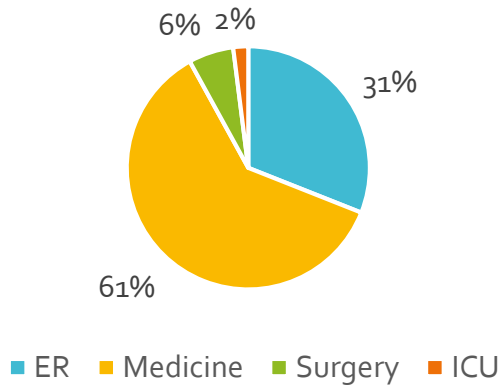
Patients characteristic

	Overall	Persistent	Non persistent	p
Origin: N (%)				
- Primary	86 (43%)	28 (39%)	39 (41%)	0.88
- Pulmonary	12 (6%)	2 (3%)	7 (7%)	0.22
- PVC-CVC	68 (34%)	31 (44%)	32 (34%)	0.17
- ABSSI	17 (9%)	6 (8%)	8 (8%)	0.98
- Bone	10 (5%)	4 (6%)	5 (5%)	0.90
- Non skin Abscess	6 (3%)	0	4 (4%)	
Endovascular devices N (%)	41 (21%)	19 (27%)	16 (17%)	0.12
Dyalisis	22 (11%)	12 (17%)	9 (10%)	0.16
Orthopedic devices N (%)	11 (5.5%)	3 (4%)	6 (6%)	0.56

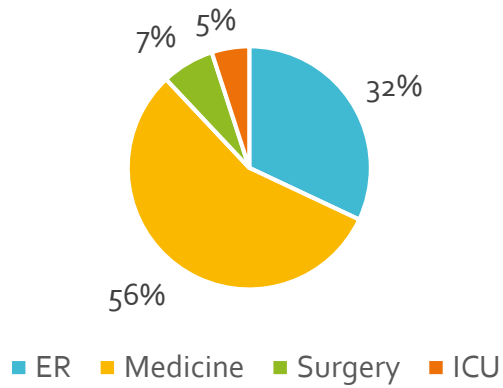
Ward: overall



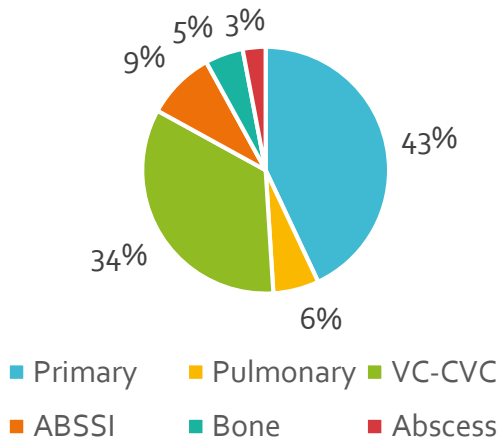
Ward: persistent



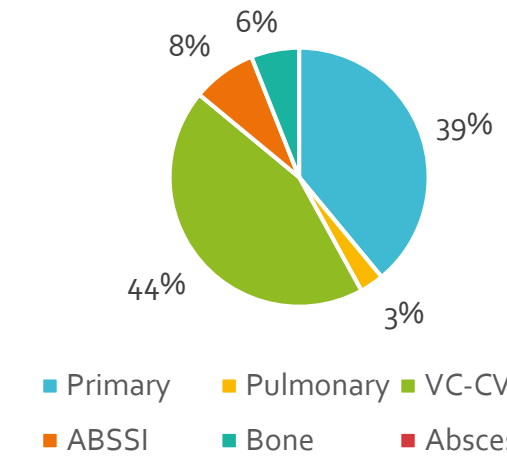
Ward: non-persistent



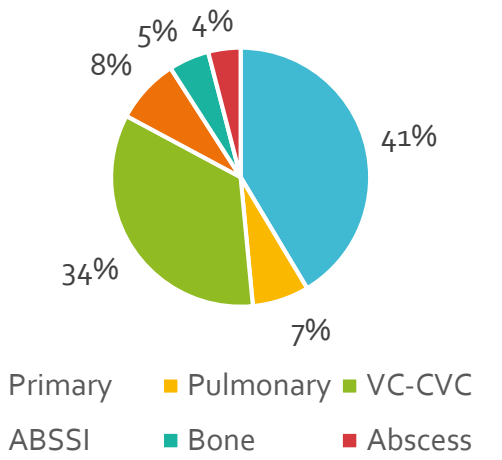
Origin: overall



Origin: persistent

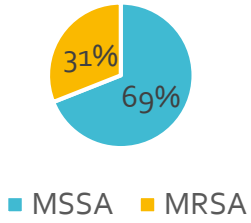


Origin: non-persistent

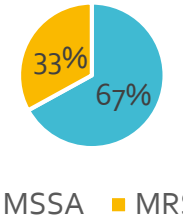


Blood coltures characteristics

Pathogen: overall

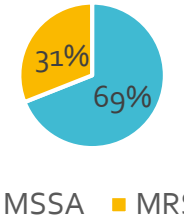


Pathogen: non-pers

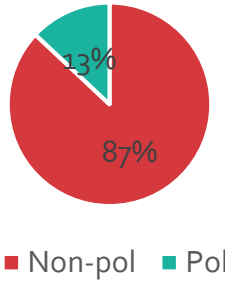


p=0.749

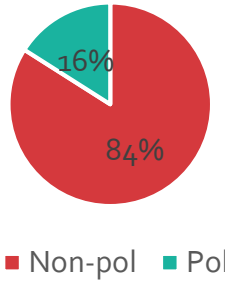
Pathogen: pers



Polimicrobic: overall

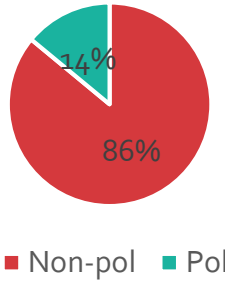


Polimcrobic: non-pers

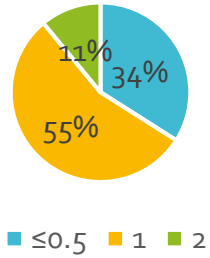


p=0.783

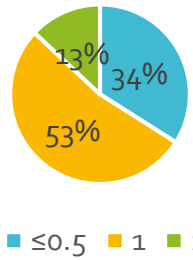
Polimicrobic: persistent



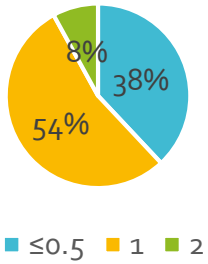
MIC vanco: over

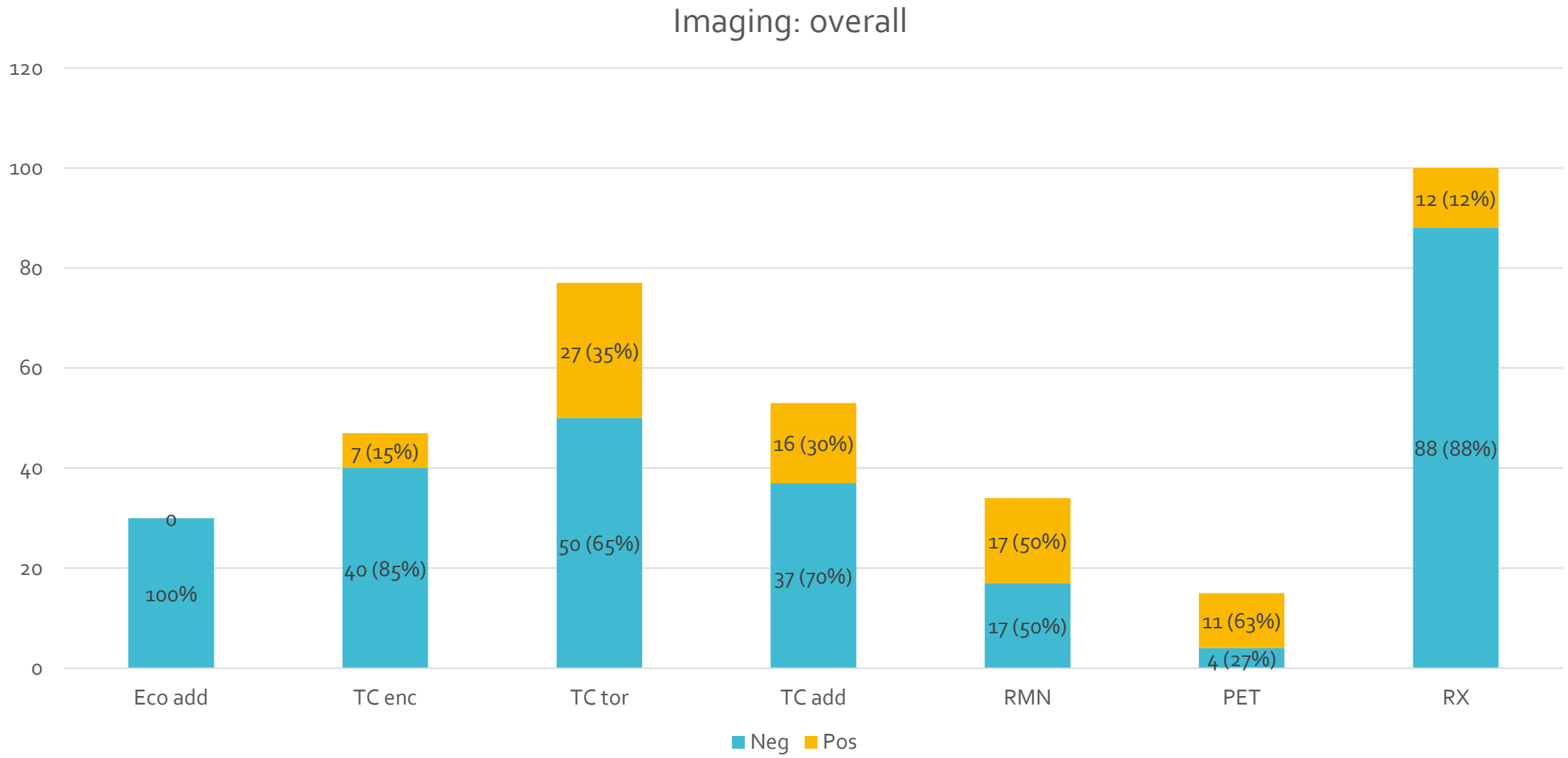


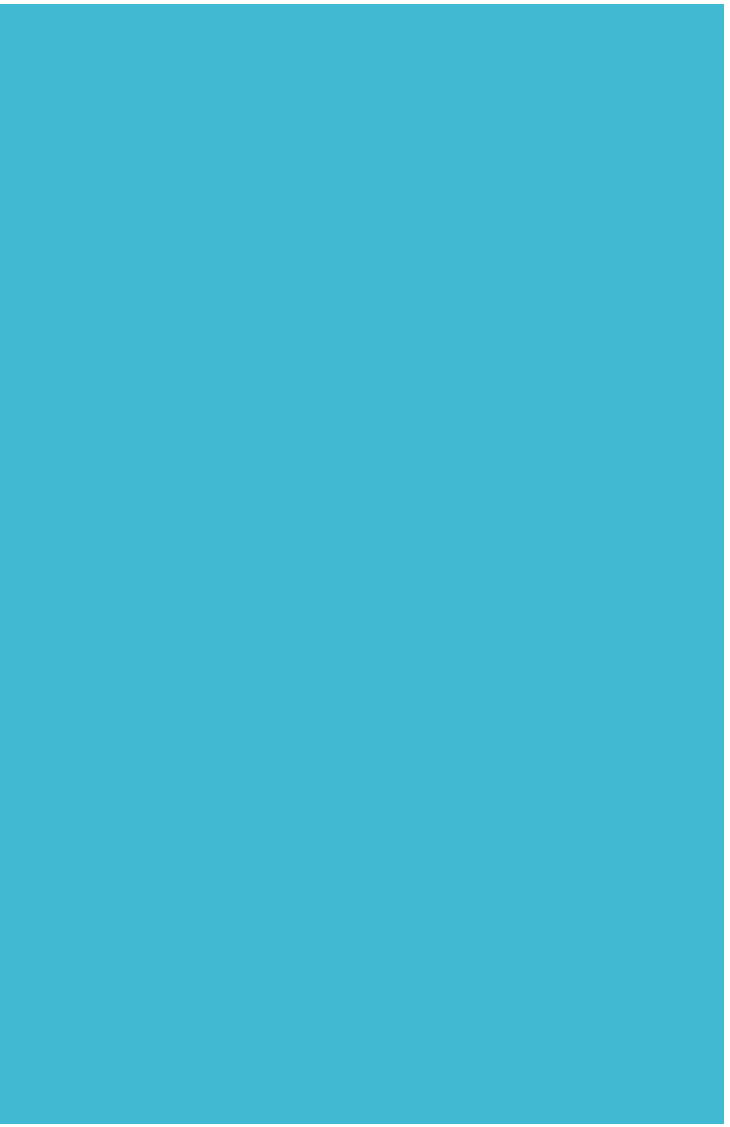
MIC vanco: non-pers

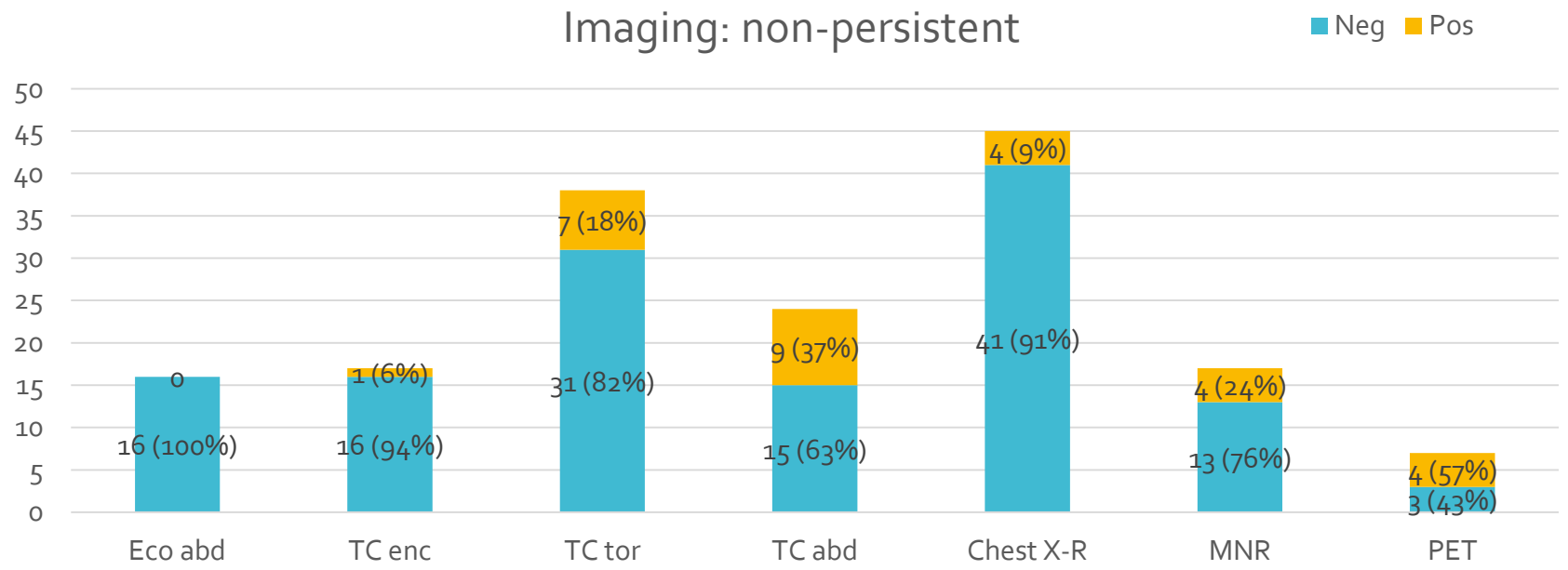


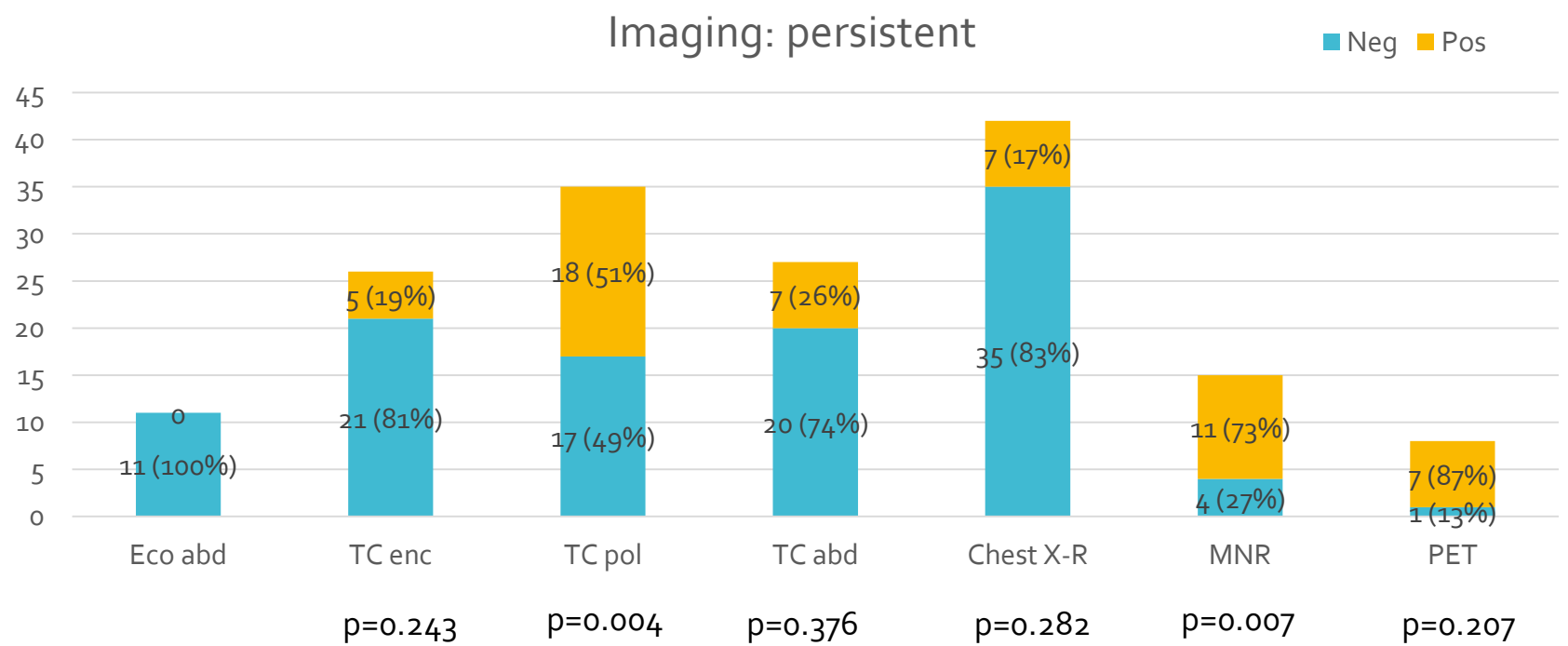
MIC vanco: pers




Imaging: overall
120
100
80
60
40
20
0
0
100%
7 (15%)
40 (85%)
27 (35%)
50 (65%)
16 (30%)
37 (70%)
17 (50%)
17 (50%)
11 (63%)
4 (27%)
12 (12%)
88 (88%)
Eco add
TC enc
TC tor
TC add
RMN
PET
RX
Neg
Pos

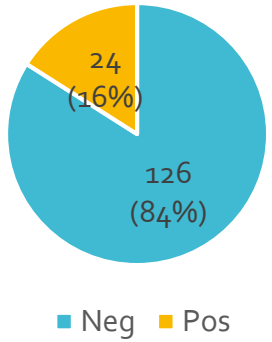



Imaging: non-persistent
Neg
Pos
50
45
40
35
30
25
20
15
10
5
0
0
16 (100%)
1 (6%)
16 (94%)
7 (18%)
31 (82%)
9 (37%)
15 (63%)
4 (9%)
41 (91%)
4 (24%)
13 (76%)
4 (57%)
3 (43%)
Eco abd
TC enc
TC tor
TC abd
Chest X-R
MNR
PET

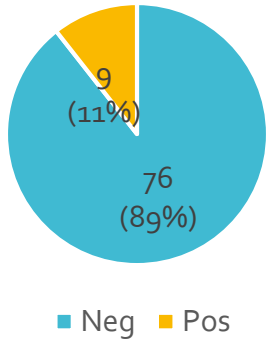

Imaging: persistent
Neg
Pos
45
40
35
30
25
20
15
10
5
0
0
11 (100%)
5 (19%)
21 (81%)
18 (51%)
17 (49%)
7 (26%)
20 (74%)
7 (17%)
35 (83%)
11 (73%)
4 (27%)
7 (87%)
1 (13%)
Eco abd
TC enc
TC pol
TC abd
Chest X-R
MNR
PET
p=0.243
p=0.004
p=0.376
p=0.282
p=0.007
p=0.207

Ecocardiography

EcoTT: overall

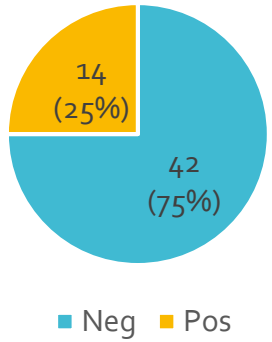


EcoTT: non-pers

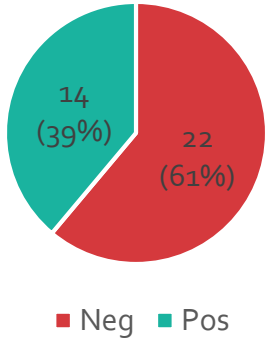


p=0.027

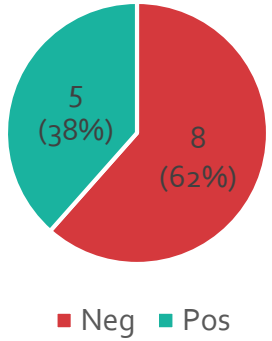
EcoTT: pers



EcoTE: overall

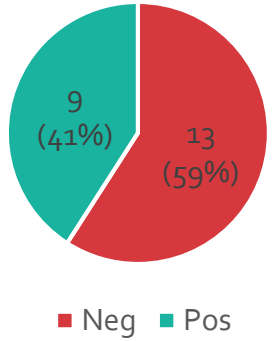


EcoTE: non-pers

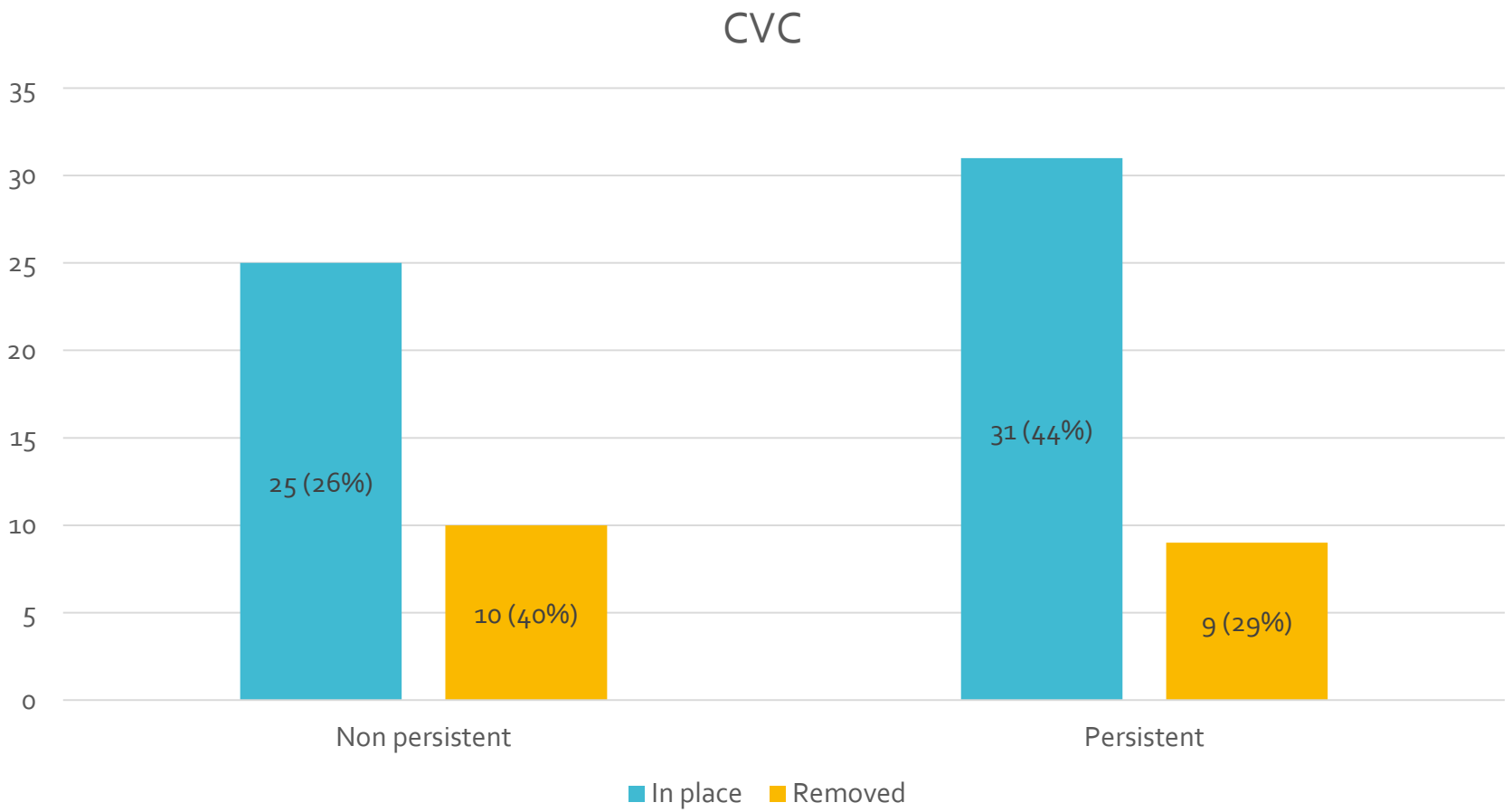


p=0.886

EcoTE: pers

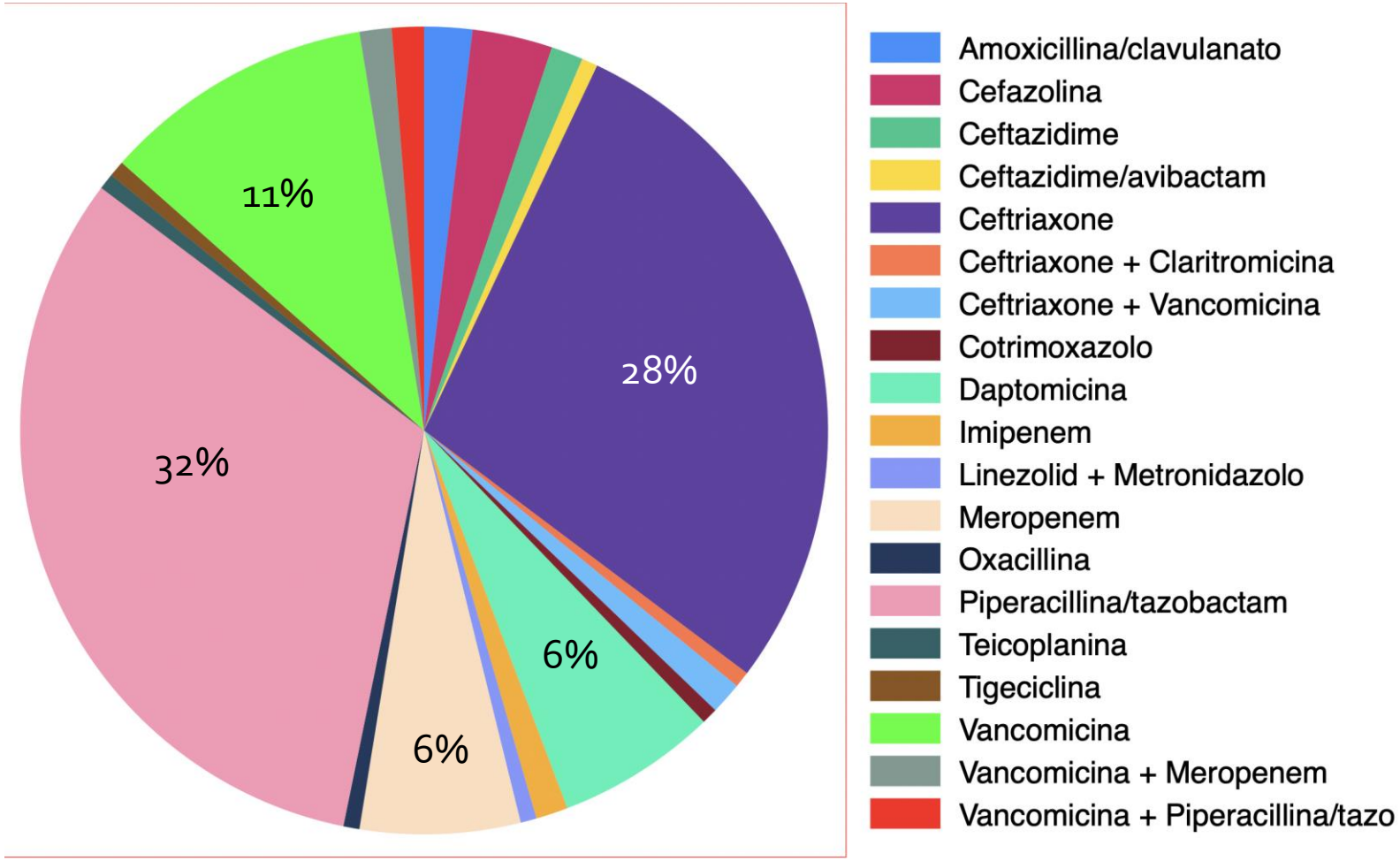


Secondary localization



OR 2.16 (present vs not present), 95%C.I.: 1.12 – 4.17, p=0.022

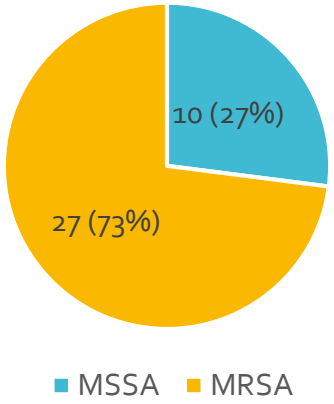
Empiric Therapy



Empiric Therapy

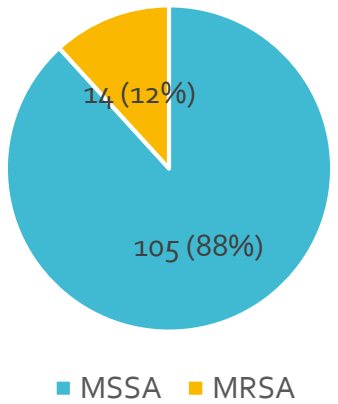
Adequacy of empiric treatment

Inadequate empiric therapy

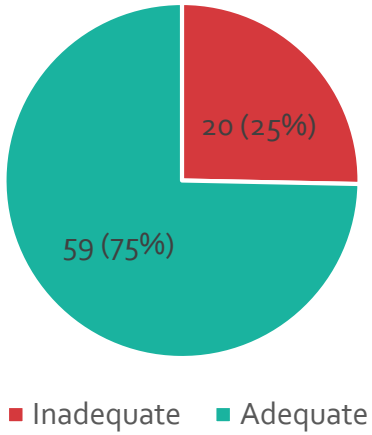


p<0.005

Adequate empiric therapy

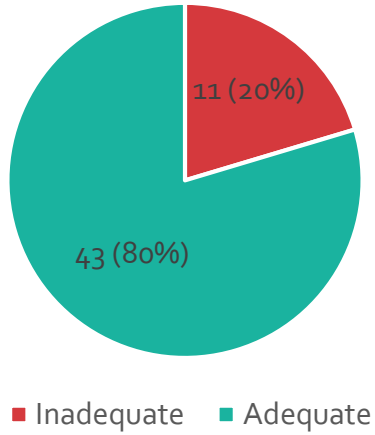


Non persistent



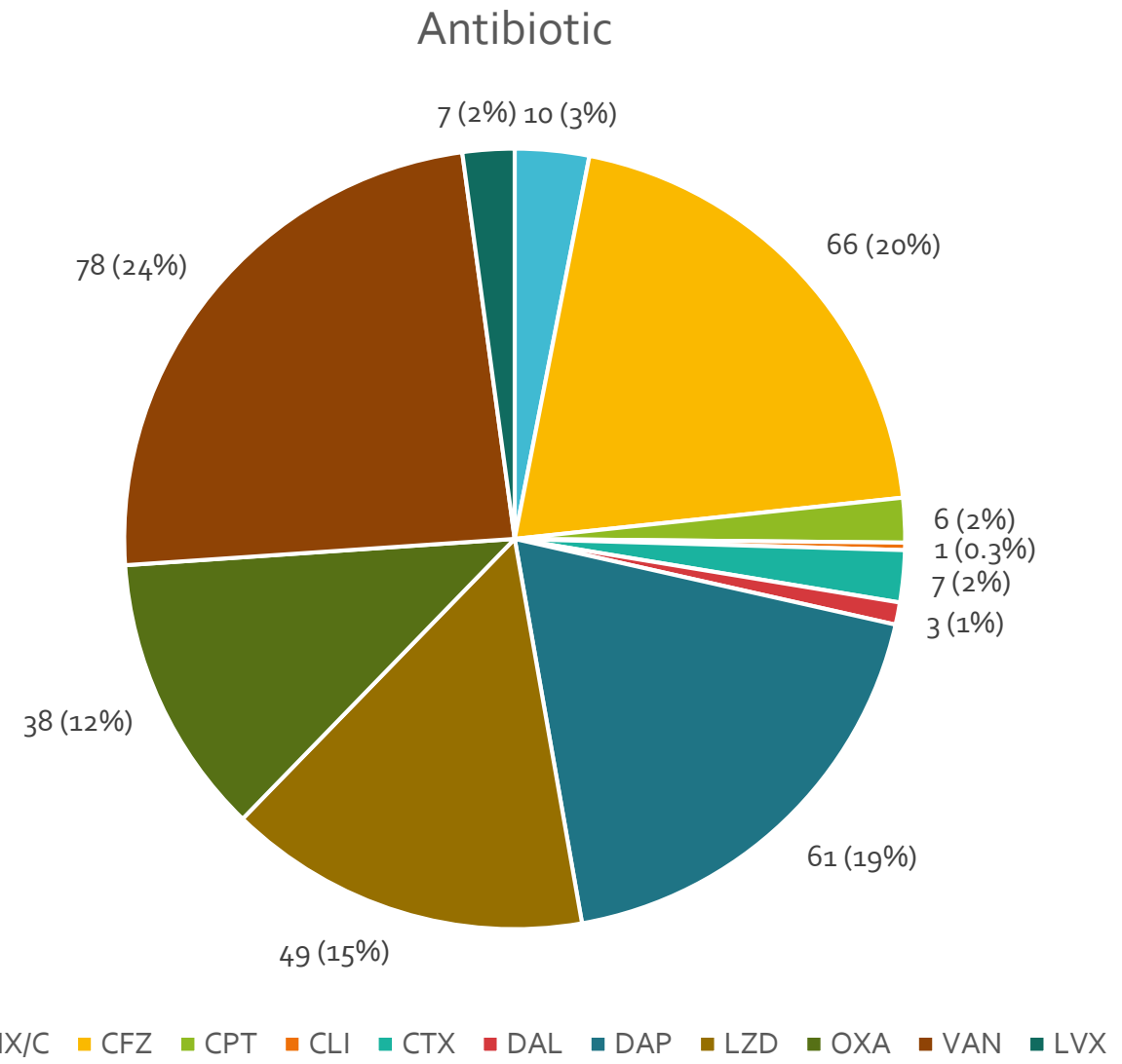
p=0.580

Persistent

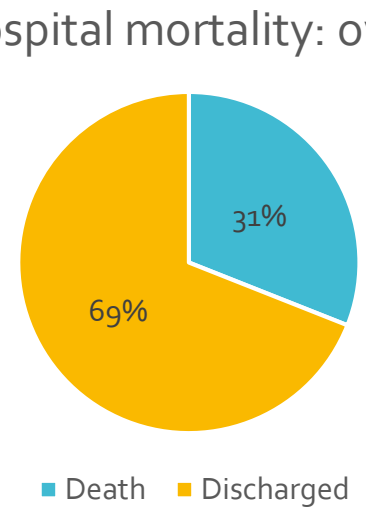


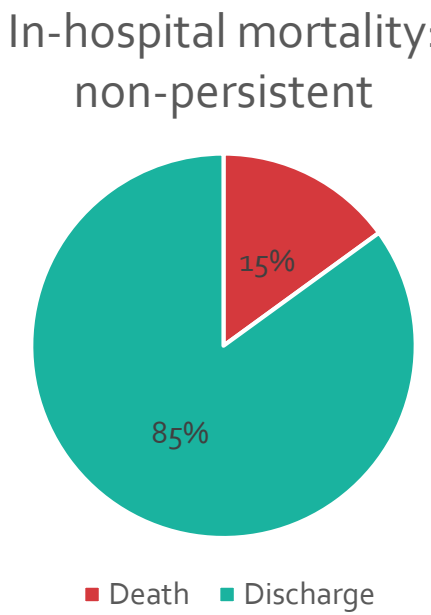
Targeted Therapy

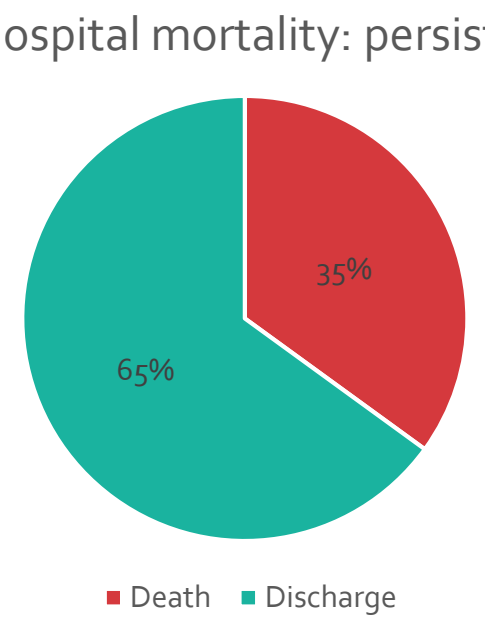
Anti-Staphylococcus therapy



In-hospital mortality







O.R. 3.18 (persistent vs non persistent SAB) (C.I. 95%: 1.51-6.72), p=0.002

Factors associated with persistent SAB	OR	95%C.I.	p
Endovascular device	1.80	0.85 – 3.83	0.124
Dyalisis	1.94	0.77 – 4.90	0.159
Orthopedic device	0.65	0.16 – 2.71	0.559
Origin of BSI: - Primary - Pulmonary - Venous - ABSSSI - Bone	 0.95 0.37 1.55 1.02 1.09	 0.51 – 1.78 0.08 – 1.83 0.82 – 2.92 0.34 – 3.07 0.28 – 4.20	 0.877 0.222 0.174 0.978 0.904
Presence of CVC	2.16	1.12 – 4.17	0.022
Removal of CVC in 72h	0.50	0.15 – 1.58	0.236
MRSA BSI	0.90	0.47 – 1.73	0.749
Polimicrobic BSI	0.89	0.37 – 2.11	0.783

Factors associated with persistent SAB	O.R.	95% I.C.	p
Positive ecoTT	2.81	1.12 – 7.05	0.027
Positive ecoTE	1.11	0.27 - 4.51	0.886
Diagnostic: - Positive enc CT - Positive pul CT - Positive abd CT - Positive MNR - Positive PET - Positive chest X-ray	 3.81 4.69 0.58 8.94 5.25 2.05	 0.40 – 35.90 1.63 – 13.46 0.18 – 1.92 1.80 – 44.34 0.40 – 68.95 0.55 – 7.59	 0.243 0.004 0.376 0.007 0.207 0.282
Embolization (at least one septic emobolization): - Pulmonary	5.98 9.55	2.50 – 14.30 1.02 – 89.22	<0.005 0.05
Abscess	1.57	0.65 – 3.80	0.316
Source control	2.4	0.44 – 12.98	0.309
Adequate empiric therapy	1.33	0.58 – 3.05	0.508

Multivariate for mortality	aOR	95% C.I.	p
Persistent SAB	1.65	0.69 – 3.97	0.263
Presence of CVC	1.18	0.48 – 2.90	0.710
I.E.	1.81	0.63 – 5.17	0.268
Embolization	1.49	0.53 – 4.15	0.448

Multivariate for persistent SAB	aOR	95% C.I.	p
MRSA	1.78	0.66 – 4.84	0.255
Age	1	0.97 – 1.02	0.918
Community acquired	0.89	0.42 – 1.89	0.760
Adequate empiric therapy	1.91	0.64 – 5.70	0.245
Charlson score	0.95	0.80 – 1.13	0.595
Dyalisis	1.59	0.55 – 4.59	0.394
Presence of endovascular device	2.20	0.94 – 5.10	0.068

Conclusions

- Prevalence of persistent SAB at San Paolo Hospital: 43%
- At univariate analysis persistent SAB associated risk factors: presence of a CVC, embolization, presence of I.E.; not confirmed at multivariate
- Persistent SAB is associated with a higher mortality risk

Limitations

- Small sample size (only 71 persistent SAB for the moment)
- Retrospective study

Bibliography

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