



# Gram-negative Bacteremia in Neutropenic Patients: Risk Factors for Mortality in the Era of Multiresistance

Herrera F.<sup>1</sup>, Laborde A.<sup>2</sup>, Jordán R.<sup>3</sup>, Roccia Rossi I.<sup>4</sup>, Guerrini G <sup>5</sup>, Valledor A.<sup>6</sup>, Costantini P.<sup>7</sup>, Dictar M.<sup>8</sup>, Nenna A.<sup>9</sup>, Caeiro J.P.<sup>10</sup>, Torres D.<sup>1</sup>, González Ibañez M.L.<sup>2</sup>, Pinoni MV.<sup>3</sup>, Argüello F.<sup>4</sup>, Luck M.<sup>7</sup>, Racioppi A.<sup>8</sup>, Poletta F.<sup>1</sup>, ABC and SCT Study Group<sup>11</sup>, Carena A.<sup>1</sup>.

1.CEMIC / 2. FUNDALEU / 3. Hospital Británico de Buenos Aires /4. Hospital HIGA San Martín, La Plata / 5. Hospital HIGA Dr. Rodolfo Rossi, La Plata / 6. Hospital Italiano de Buenos Aires / 7. Instituto de Oncología Angel H. Roffo /8. Instituto Alexander Fleming/ 9 Hospital Municipal de Oncología Marie Curie / 10. Hospital Privado Centro Médico de Córdoba. / 11. Argentinean Bacteremia in Cancer and Stem Cell Transplant Study Group (ROCAS Study)

## BACKGROUND

Gram-negative bacteremia (GNB) in neutropenic patients is a major cause of infection-related mortality.

## OBJECTIVES

To identify factors associated with 7-day and 30-day mortality during GNB episodes in neutropenic patients.

## METHODS

Prospective multicenter study. Episodes of GNB in adult neutropenic cancer and Hematopoietic Stem Cell Transplant patients were included in 10 centers of Argentina specialized in oncological and transplant patient care, from May 2014 to January 2018. To identify factors associated with 7-day and 30-day mortality, variables with  $p < 0.05$  in univariate analysis were included in a logistic regression model for multivariate analysis.

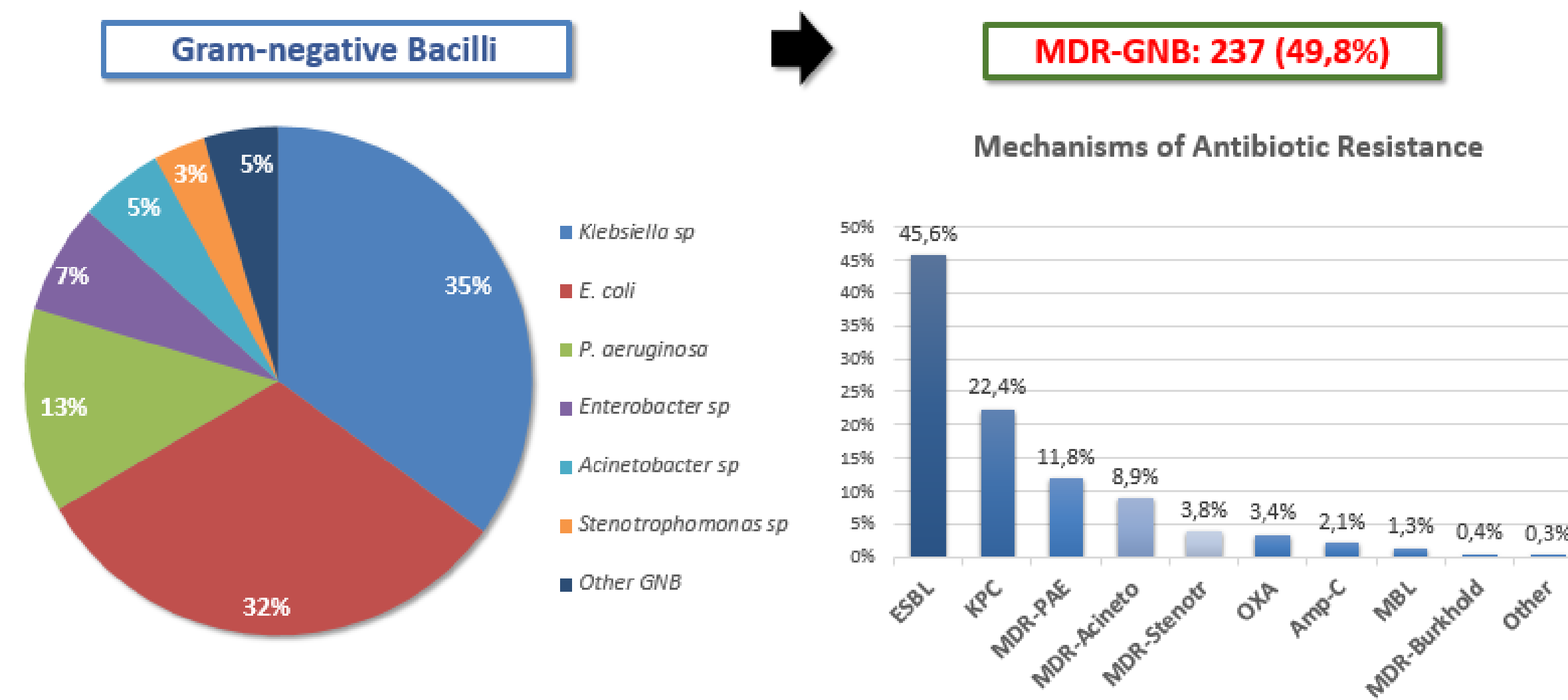
## RESULTS

- 476 episodes of Gram-negative bacteremia were included
- 7-day mortality: 19.53 %
- 30-day mortality: 26.47 %

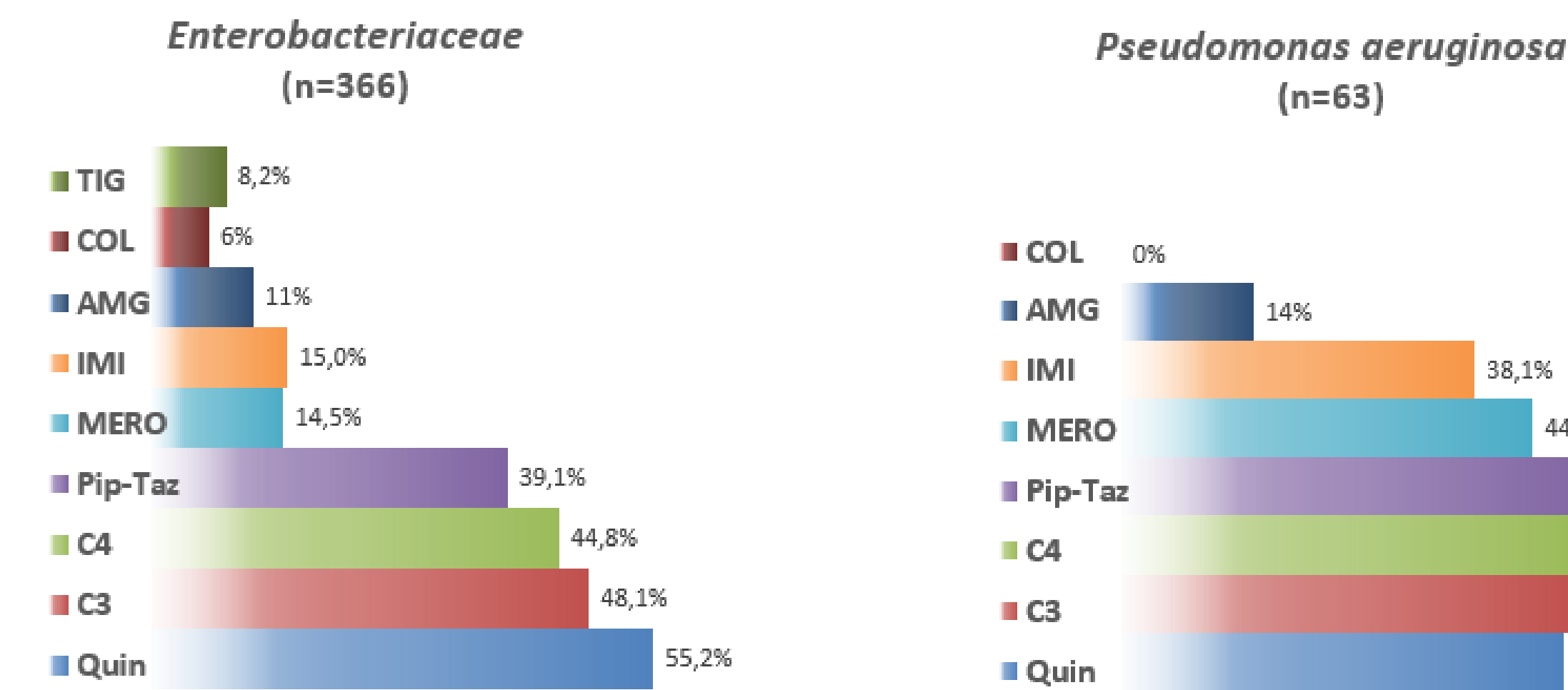
## Baseline Characteristics

Variables	
Age (years) - Median (p25-p75)	50 (32-62)
Male Gender - n (%)	271 (56,9%)
Hematologic Neoplasm - n (%)	324 (68,1%)
Hematopoietic Stem-Cell Transplant - n (%)	109 (22,9%)
Solid Organ Neoplasm -n (%)	49 (9%)
High Risk Neutropenia (MASCC Score) - n (%)	420 (89%)
Identified Source of infection - n (%)	325 (68,3%)
Respiratory infection	32 (6,7%)
Catheter-related infection	60 (12,6%)
Abdominal infection	154 (32,4%)
Skin and soft tissue infection	24 (5%)

## Microbiological Characteristics



## Antibiotic Resistance Profile



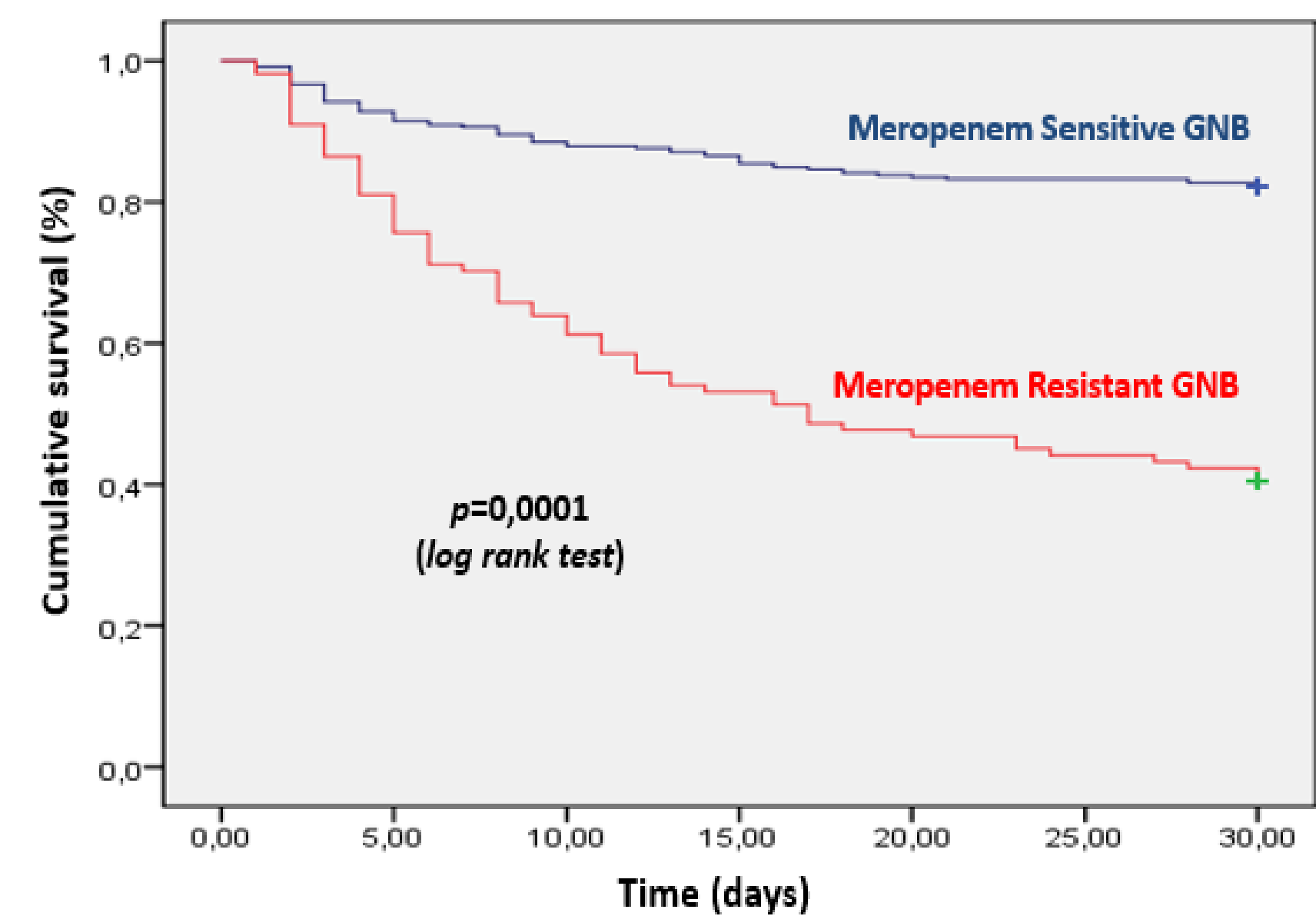
## Risk Factors for 7-day Mortality

Variable	OR (95% CI) Univariate	OR (95% CI) Multivariate	p <sup>¶</sup>
Hypotension	6.51 (3.87-11.00)	1.61 (0.71-3.64)	0.25
ICU admission	18.82 (10.42-34.55)	2.46 (0.95-6.40)	0.06
Shock	25.56 (13.64-49.19)	7.13 (2.50-20.33)	< 0.0001
Charlson score > 4	2.21 (1.19-4.02)	2,76 (1.06-7.19)	0.037
Pitt score > 4	8.62 (4.57-16.26)	1.93 (0.81-4.62)	0.13
APACHE II score > 16	3.52 (2.14-5.80)	0.90 (0,42-1.92)	0.79
Respiratory source	4.14 (1.83-9.19)	3.67 (1.21-11.10)	0.021
Skin and soft tissue source	3.17 (1.21-7.96)	3.89 (1.01-14.94)	0.048
Cefepime- Resistant GNB	2.36 (1.44-3.90)	0.62 (0.21-1.82)	0.39
Piperacillin/tazobactam-Resistant GNB	2.78 (1.70-4.79)	1.03 (0.31-3.37)	0,95
Meropenem-Resistant GNB	6.53 (3.87-11.01)	8.60 (3.06-24.14)	< 0.0001
Combination antibiotic empirical therapy	2.62 (1.61-4.30)	0.96 (0.48-1.93)	0.93
Corticosteroid therapy	1.99 (1.22-3.23)	1.24 (0.62-2.49)	0.53
MASCC risk score index < 21	6.72 (1.70-57.97)	5.59 (0.80-38.93)	0.08
Breakthrough bacteremia	2.67 (1.46-4.79)	0.94 (0.39-2.26)	0.90

## Risk Factors for 30-day Mortality

Variable	OR (95% CI) Univariate	OR (95% CI) Multivariate	p <sup>¶</sup>
Hypotension	4.72 (2.99-7.46)	0.81 (0.36-1.81)	0.61
ICU admission	14.57 (8.69-24.48)	2.46 (1.00-6.04)	0.049
Shock	20.39 (11.87-35.14)	10.90 (4.12-28.85)	< 0.0001
Charlson score > 4	2.31 (1.30-4.05)	3.81 (1.62-8.91)	0.02
Pitt score > 4	7.80 (4.14-14.98)	1.68 (0.68-4.15)	0.25
APACHE II score > 16	2.68 (1.72-4.17)	0.55 (0.27-1.13)	0.10
Respiratory source	4.60 (2.06-10.46)	4.41 (1.53-12.73)	0.006
Skin and soft tissue source	2.96 (1.78-7.41)	3.66 (1.00-13.42)	0.049
Cefepime- Resistant GNB	2.57 (1.65-4.02)	0.66 (0.35-2.12)	0.75
Piperacillin-tazobactam-Resistant GNB	2.95 (1.89-2.60)	0.96 (0.35-2.59)	0,94
Meropenem-resistant GNB	7.04 (4.29-11.54)	7.06 (2.83-17.64)	< 0.0001
Combination antibiotic empirical therapy	2.70 (1.74-4.20)	1.10 (0.58-2.07)	0.75
Corticosteroid therapy	1.90 (1.22-2.94)	1.08 (0.57-2.04)	0.80
MASCC risk score index < 21	4.80 (1.69-18.68)	4.33 (0.94-19.79)	0.059
Breakthrough bacteremia	3.57 (2.04-6.22)	1.60 (0.72-3.55)	0.24
Refractory cancer	3.14 (1.63-6.06)	4.30 (1.57-11.78)	0.005
Nosocomial acquisition	1.93 (1.07-3.63)	2.09 (0.81-5.41)	0.12

## Outcomes - 30-day mortality



## CONCLUSION

The identification of certain prognostic factors would allow the stratification of neutropenic patients at high risk for mortality during GNB episodes. The appropriate medical intervention of a multidisciplinary team on these factors could improve the outcome of these patients. Since Meropenem-resistant GNB is one of strongest prognostic factors, it is essential to identify the patients at risk and treat them appropriately.