

## ASSESSMENT OF RISK FACTORS ASSOCIATED WITH WIDE RESISTANCE GRAM-NEGATIVE BACTERIA INFECTIONS

Henry Pablo Lopes Campos e Reis<sup>1</sup>, Ana Beatriz Ferreira Rodrigues<sup>2</sup>, Júlio Cesar Castro Silva<sup>2</sup>, Lia Pinheiro de Lima<sup>2</sup>, Talita Lima Quinher<sup>2</sup>, Thaynara Carvalho de Freitas<sup>2</sup>, Cala Mônica Porto Pereira<sup>2</sup>, Breno Queiroz de Araujo<sup>1</sup>, Abel Brasil Ramos Da Silva<sup>1</sup>, Arnaldo Aires Peixoto Junior<sup>1</sup>, Vitor Nogueira Araujo<sup>1</sup>, Fernando Barroso Duarte<sup>1</sup>, Karine Sampaio Nunes Barroso<sup>1</sup>, Germana Perdigão Amaral<sup>1</sup>, Geovânia Maciel de Souza<sup>1</sup>, Luciana Vladia Carvalhedo Fragoso<sup>1</sup>, Evelyne Santana Girão<sup>1</sup>, Lícia Borges Pontes<sup>1</sup>, Jorge Luiz Nobre Rodrigues<sup>1</sup>

<sup>1</sup>HOSPITAL UNIVERSITÁRIO WALTER CANTÍDIO, FORTALEZA, BRAZIL, <sup>2</sup>UNIVERSIDADE FEDERAL DO CEARÁ, FORTALEZA, BRAZIL

### BACKGROUND

Enterobacteria and multidrug-resistant non-fermenting Gram-negative bacilli present a challenge in the management of invasive infections, leading to mortality rates due to their limited therapeutic arsenal. The objective of this work was to analyze risk factors that may be associated with these infections, for a better situational mapping and assertive decision-making in a university hospital in Brazil

### METHODS

The study was conducted between January and September 2019, with 167 patients in contact isolation at a university hospital in Brazil. Potential outcome-related variables for wide-resistance Gram-negative bacteria (BGN) infections were evaluated. Risk factors were identified from univariate statistical analysis using Fisher's test.

- This study was approved by the hospital's research ethics committee (Nº 2.945868)

### RESULTS

51 (30.5%) out of 167 patients in contact isolation evolved with wide-resistance BGN infection. Risk factors in univariate analysis were age, hospital unit and previous use of invasive devices. Patients aged up to 59 years were more likely to progress to infection than those aged over 60 years ( $p$  0.0274, OR 2.2, 95% CI 1.1-4.5). Those admitted to the oncohematology ( $p$  <0.001, OR 32.5, CI 9.1-116.3) and intensive care unit ( $p$  <0.001, OR 28.0, CI 3.5-225.9) units were more likely to develop this type of infection. The least likely were those admitted to a kidney transplant unit ( $p$  0.0034, OR 15.33, CI 1.8-131.0). Prior use of mechanical ventilation ( $p$  0.0058, OR 12.2, CI 2.0-76.1) and catheter-delay bladder ( $p$  0.0266, OR 5.0, CI 1.2-20.1) in patients with respiratory and urinary tract infection, respectively, were also reported as risk factors related to these infections. The gender of the patients was not significant for the study.

Table 1: Comparison of the patient profile in relation to the prevalence of the disease.

	Infection		Total	P-value	OR (95% CI)
	YES	NO			
<b>Age</b>				<b>0.0274</b>	<b>2.24 (1.1 – 4.52)</b>
Up to 59 years	26 (30.2%)	60 (69.8%)	86		
>60 years (ref)	15 (21.1%)	56 (78.9%)	71		
Total	51 (30.5%)	116 (69.5%)	167		

Table 2: Comparison of the patients' admission unit in relation to the prevalence of the disease.

	Infection		Total	P-value	OR (95% CI)
	YES	NO			
<b>ICU</b>				<b>&lt;0.001</b>	<b>28.0 (3.48 – 225.9)</b>
ICU	10	1	11		
Others (ref)	41	115	156		
<b>Oncohematology</b>				<b>&lt;0.001</b>	<b>32.5 (9.13 – 116.27)</b>
O. H.	24	3	27		
Others (ref)	27	110	137		
<b>Kidney Transplant</b>				<b>0.0034</b>	<b>15.33 (1.79 – 130.96)</b>
K. T.	6	1	7		
Others (ref)	45	115	160		

Table 3: Comparison of the use of "devices" by patients in relation to the prevalence of the disease.

	Infection by associated		Total	P-value	OR (95% CI)
	infection site				
	YES	NO			
<b>Mechanical Ventilation</b>				<b>0.0058</b>	<b>12.2 (2.05 – 76.15)</b>
MV	5	8	13		
No MV (ref)	2	39	41		
<b>Catheter-delay Bladder</b>				<b>0.0266</b>	<b>5.0 (1.24 – 20.12)</b>
CDB	6	7	13		
No CDB (ref)	6	35	41		

### CONCLUSION

This study determined that variables such as age, hospitalization unit, use of mechanical ventilation and delayed bladder catheter could be considered important risk factors in triggering the infectious process by wide-resistant gram-negative bacteria. Thus, the analysis of these factors becomes a great foundation to prevent the development of multiresistant pathogens through prevention strategies, prophylaxis management and more targeted empirical therapies.