

ORAL PRESENTATION

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# Microbiological profile and multidrug resistant bacteria in pneumonia

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## Background

Currently accepted classifications of pneumonia include community acquired pneumonia (CAP), healthcare-associated pneumonia (HCAP), hospital-acquired pneumonia (HAP), and ventilator-associated pneumonia (VAP). Previous studies have shown a high rate of patients with HCAP or HAP caused by multidrug-resistant bacteria (MDR). Our aim was to determine the differences in etiology and antibiotic-resistant bacteria between CAP, HCAP and HAP groups.

## Methods

We performed a retrospective study in which we included patients over 18 years old, with culture-positive pneumonia, between 2008 and 2011, from 3 clinical hospitals. The patients were classified as having CAP, HCAP or HAP. We recorded the bacteriologic results for the following samples: blood culture, sputum, bronchial aspirate, bronchoalveolar lavage. The statistical analysis was carried out using Graph Pad Prism 5.

## Results

A total of 340 patients were recorded (160 with CAP, 39 with HCAP and 141 with HAP). *Streptococcus pneumoniae* and *Haemophilus influenzae* were seen more frequently in CAP (33%, 14.4%) than in HCAP or HAP (1.4%, 0%;  $p < 0.0001$ ). The most common pathogens in HAP were MRSA (27.7%), *Acinetobacter* spp. (26.2%), *Klebsiella pneumoniae* (19%). Compared to the HCAP, *Acinetobacter* spp. and MRSA were significantly associated with HAP (OR 54.8,  $p < 0.0001$ , LR 3.9). Compared to the HAP *P aeruginosa* and *E coli* were more common in HCAP (36%,  $p = 0.04$ , OR 2; respectively 23%,  $p = 0.001$ ,

OR 7). Among Gram-negative bacilli, resistance to ceftazidime was higher (86%) and significantly associated with HAP (OR 14.3,  $p < 0.0001$ , LR 2.7). The extended-spectrum  $\beta$ -lactamase-producing *Enterobacteriaceae*, were more frequent in HAP (67.7%). However, no differences were found regarding ESBL producing *Enterobacteriaceae* between HAP and HCAP ( $p = 0.06$ ). MDR bacteria, including MRSA and gram-negative bacilli, were identified more frequently in HAP versus HCAP (78.7% vs. 12.8%;  $p < 0.0001$ , OR 25, LR 6).

## Conclusion

*S pneumoniae* was the main causative pathogen in CAP. Despite the higher frequency of *P aeruginosa* in the HCAP group, the MDR bacteria were associated with the HAP group. Our results reveal important differences between HAP and HCAP concerning the etiology and antibiotic resistance patterns.

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