

## Background

Ventilator associated pneumonia (VAP) is defined as pneumonia that occurs 48 hours to 72 hours after tracheal intubation. This study aimed to analyze microbial causes, susceptibility patterns and factors affecting mortality rates.

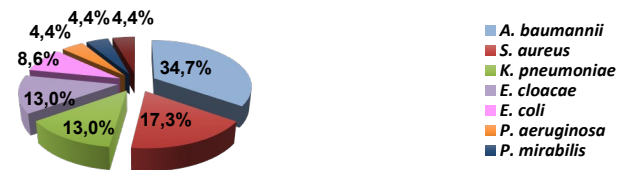
## Material/methods

Patients hospitalized in the intensive care unit (ICU) and clinically suspected of having VAP had been included in a prospective study conducted from 1<sup>st</sup> march to 30<sup>th</sup> September. Sampling the lower airways to get quantitative cultures were done using tracheobronchial aspiration (TBAS) and Protected Specimen Brush (PSB).

## Results

Of 72 hospitalized patients we reported 14 (19, 4%) with VAP as defined by bronchoscopic specimen culture results. Polymicrobial origin was identified in 6 cases (42, 8%). Among 23 bacterial isolates, the most frequent causative microorganism was *A. baumannii* (34, 7%) followed by *S. aureus* (17, 3%), *K. pneumoniae*, *E. cloacae* with prevalence of 13% each and *E. coli* (8, 6%). *A. baumannii* showed high resistance to Imipenem (75%). Among *Enterobacteriaceae*, three were carbapenemase producers and one was ESBL producer. Resistance to Methicillin in *Staphylococci* wasn't observed. Mortality rate was 34, 7% and its associated factors were an IGS II score > 40, multidrug-resistant pathogens, bacteremia and a length of stay (LOS) > 10 days.

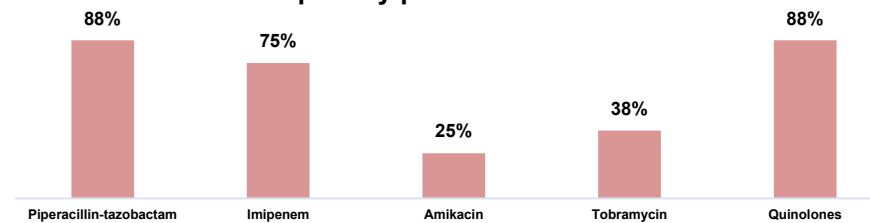
### Pathogens isolated



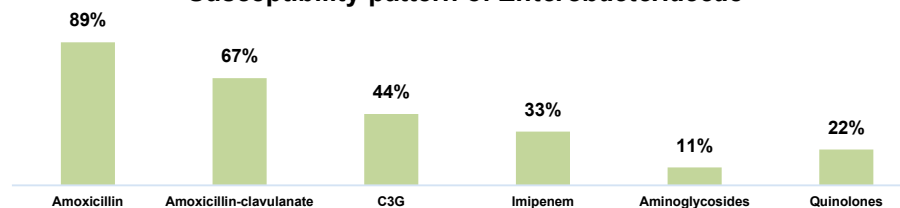
### Prevalence of Multidrug-resistant bacteria causing VAP



### Susceptibility pattern of *A. baumannii*



### Susceptibility pattern of *Enterobacteriaceae*



## Discussion

Most of the currently available studies on VAP have shown that a majority of these infections are caused by GNB often highly resistant to antibiotics, rendering difficult the selection of the initial antimicrobial treatment. When the etiology of VAP was analyzed, *Streptococcus pneumoniae*, *Haemophilus influenzae*, *Klebsiella pneumoniae*, and *MSSA* were found to be more common in early-onset VAP, whereas *Pseudomonas aeruginosa*, *Acinetobacter baumannii*, and *MRSA* were more frequent in late-onset VAP. In the present study, *Acinetobacter baumannii*, *MSSA*, and *Enterobacteriaceae* were the most common microorganisms to be seen while resistant bacteria are responsible of 43% of VAP. Studies demonstrated that LOS and prior antibiotic treatment were the major risk factors for resistant bacteria in VAP. Another study reported that patients staying in the hospital for more than 48 h are more likely to be colonized with *Pseudomonas spp* and *MRSA*.

On the other hand, inappropriateness of empirical antibiotic therapy, presence of secondary bacteremia and prolonged hospital stay were found to be associated with increased mortality. Studies have affirmed the presence of 8–20% bacteremia in every episode of nosocomial pneumonia.

## Conclusion

The main problem in this hospital is multidrug resistant *A. baumannii* rather than methicillin resistant *Staphylococcus aureus*. Knowing the pattern of antimicrobial resistance can prevent prescribing inappropriate antibiotics. Moreover, effective steps should be taken towards reducing the emergence of microbial resistance.