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BACKGROUND

•The frequency, causes, and impact of superinfection among hospitalised patients with community-acquired pneumonia (CAP) have not been specifically explored.

•We aimed to determine the incidence, aetiology, antimicrobial resistance, and prognosis of superinfection in a large cohort of patients with CAP.

METHODS

•**Design:** observational analysis of a prospective cohorts of hospitalised adults with CAP.

• **Setting:** Hospital Universitari de Bellvitge, Barcelona, Spain. Years: 2002-2015.

• **Superinfection** was defined as any new infection occurring during hospitalisation.

• **Analysis:** Patients with superinfection were compared with the remaining patients. For the purpose of this study, patients hospitalized in Intensive Care Unit (ICU) were analysed separately from patients hospitalised in conventional wards. We described different types of infections, microbiology, adequateness of empiric antibiotic treatment, and influence of superinfections on outcomes (ICU-mortality, infection-related mortality and 30-day mortality).

RESULTS

3550 patients with CAP were included :

- 403 (11.4%) hospitalised in the ICU**
- 3147 (88.6%) in conventional wards**

SUPERINFECTIONS:

- ICU: 73 (18.1%) patients. 121 episodes (1-8 x patient)**
- Ward: 16 (0.5%) patients. 17 episodes in wards (1-2 x patient)**

Types of superinfections in patients hospitalised for CAP

	ICU 121 episodes	In-ward 17 episodes
Ventilator-associated pneumonia (VAP)	64 (52.9)	-----
Nosocomial pneumonia (no VAP)	5 (4.1)	10 (58.8)
Bloodstream infections	33 (27.3)	1 (6.9)
Urinary tract infections	13 (10.7)	4 (23.5)
Skin infections	6 (5.0)	2 (11.7)
Colangitis	2 (1.6)	-----
Surgical wound infections	2 (1.6)	-----
Gastro-intestinal infections	2 (1.6))	-----
Otitis	1 (0.8)	-----

Microorganisms isolates in superinfections episodes in CAP pts

	ICU 121 isolates	In-ward 13 isolates
<i>Pseudomonas aeruginosa</i>	35 (28.9)	6 (46.2)
<i>Acinetobacter baumannii</i>	15 (12.4)	1 (7.7)
Others Gram Negative Bacteria	25 (20.7)	3 (23.1)
<i>Staphylococcus aureus</i>	13 (10.7)	-----
Coagulase-negative staphylococci	10 (8.3)	-----
Enterococci	8 (6.6)	1 (7.7)
<i>Candida</i> spp.	7 (5.7)	1 (7.7)
<i>Aspergillus fumigatus</i>	6 (5.0)	1 (7.7)
CMV	1 (0.8)	-----
<i>Clostridium difficile</i>	1 (0.8)	-----
MDR strains	76 (62.8)	7 (53.8)

- **ICU Empirical treatment was inadequate in 34/116 (29%) cases.**
- **ICU mortality was higher in patients with superinfection (38% vs. 22%, p=.005).**

- **In 17 (24%) ICU patients the death was attributed to superinfection.**
- **In-ward empirical antibiotic treatment was inadequate in 3/13 (23%).**
- **None of these non-ICU patients died.**

CONCLUSIONS

- Superinfection is a significant problem among ICU-admitted patients for CAP, mainly VAP and catheter-related BSI.
- *P. aeruginosa* and other GNB are the most frequently isolated organisms, and MDR strains are particularly frequent.
- Patients with superinfection receive often an inadequate empirical antibiotic therapy and have high mortality.