

**INTRODUCTION**

Health care-associated pneumonia (HCAP) is pneumonia acquired in health care environments outside of the traditional hospital setting. Increased numbers of patients are living outside hospital environment, in long-term-health care facilities (LTHC), rehabilitation facilities, and dialysis centers which brings them at risk of infections. The patient population at risk is diverse and prone to Multidrug resistant Organisms. HCAP are category of pneumonias which are distinct from Hospital-acquired pneumonia (HAP), Ventilator-associated pneumonia (VAP) and Community acquired Pneumonia (CAP).<sup>1</sup> Though both HCAP & CAP are acquired outside hospital surrounding, HCAP varies in pathogens involved, pathogenesis and prognosis. HCAP resembles HAP and VAP more closely as far as etiology, pathogenesis and treatment are concerned. These patients have major risk factors such malignancy, renal disease, COPD, immune suppression, dementia and impaired mobility.

**DEFINITION**

Patient, coming to an acute-care health facility from a non hospital environment, (Health care association but Non Hospital environment) consisting of already-ill population of nursing-home residents, patients in long-term care, patients undergoing same day procedures, patients receiving home- or hospital based intravenous therapy, and patients undergoing dialysis when develop pneumonia its called Health Care Associated Pneumonia.

**EPIDEMOLOGY**

Multidrug-resistant (MDR) bacteria are the commonest pathogens involved.<sup>2</sup> This has clinical as well as microbiological similarity to HAP & VAP. HCAP has been associated with Methicillin-resistant *S.aureus* (MRSA), *Pseudomonas aeruginosa*, *Streptococcus pneumoniae*, and *Haemophilus* species. Dialysis-associated pneumonia have higher incidence of above organisms along with *Klebsiella*. Higher colonization with MRSA was seen in dialysis, home infusion therapy, wound care and nursing care patients. Chemotherapy patients had higher incidence of Fungi and GNB especially MDR pathogens (*Pseudomonas* and *Klebsiella*). Frequent fungal pneumonias distinguish it from other HCAP's.<sup>3</sup> Colonization of rectum and nasal cavity is seen with other MDR organisms especially *Providencia stuartii*, *Proteus mirabilis*, *Escherichia coli* and *Morganella morganii* was high.<sup>4</sup>

**Risk factors for infection with multidrug-resistant (MDR) pathogens**

- Residing in a extended health care facility
- Home infusion therapy (including antibiotics)
- Dialysis
- Home wound care
- Antimicrobial therapy within 90 days
- Immunosuppressive disease and therapy

**PATHOGENESIS**

HCAP are more likely to occur once large number of microorganisms reach lower respiratory tract. This especially occurs when the host defenses are overwhelmed (aspiration or contaminated respiratory therapy equipments), defenses are impaired (immunodeficiency or steroids) or highly virulent organisms are present. Patients are repeatedly exposed to the microorganisms in health care facilities, especially Gram-negative bacteria (GNB). Since patients under health care are repeatedly exposed to these organisms, they are more prone to infection with them. Vulnerability increases as other factors directly related to hospitalization increase exposure and patient resistance. Contaminated oropharyngeal secretions getting microaspirated is the most important factor. These organisms vary rarely cause CAP. Up to 70 % patients under sedation or with altered consciousness and 50 % of normal people micro aspirate during sleep. In presence of new pathogenic virulent organisms the previously benign microaspiration becomes a mechanism of pneumonia by virulent organisms.<sup>5</sup>

**TREATMENT**

The management of HCAP is complex where empirical therapy plays a major role, especially so when convincing data regarding same is not available. Clinical assessment plays an important role in therapy to avoid over treatment with an unnecessarily broad spectrum of antibiotics.

With major focus on MDR organisms many prefer to treat with empirical therapy of hybrid approach. Patients have multiple risk factors, the ones with at least 2 of the 3 risk factors i.e. severe illness, prior antibiotic therapy, and poor functional factors are more likely to be infected with MDR pathogens.<sup>6</sup> While another set of patients with minimal risk factors may not require MDR empirical treatment. Thus broadly, antibiotic administration could be categorized into limited-spectrum therapy and broad-spectrum therapy, where broad spectrum is reserved for

206 patients with 2 of the 3 identified risk factors for MDR pathogens.

Limited spectrum should include a respiratory Quinolone alone or, alternatively, combined with a selected Beta-lactam (active against drug-resistant *S. pneumoniae*), plus adding a Macrolide (especially if *Legionella*, *Chlamydia*, or *Mycoplasma*) are suspected. Broad-spectrum therapy is reserved for suspected MDR cases, especially if *S. pneumoniae*, *P. aeruginosa*, MRSA & *Legionella*. So combination of Beta-lactams / Carbapenem, with antipseudomonal Quinolone is initiated as empirical therapy, while Linezolid or Vancomycin should be added if MRSA is strongly suspected. All antibiotics need to be given parentally in clinically severe cases after clinical assessment. Aminoglycosides should be used alternatively to Quinolones if there is history of allergy, intolerance or recent therapy with Quinolones in the past 3 months.

Though there are no randomized trials that provide evidence for dual therapy, but clinical data suggests that combination regimen therapy of an empirical antibiotic is more likely to succeed. Consideration of synergistic effects, development of resistance, and toxicity should be viewed with optimism.

MRSA infections, a common problem encountered by clinicians, results into significant morbidity and mortality. There is increasing incidence of MRSA in hospitals and community but microbiological evidence of MRSA as a major pathogen in HCAP is less. Treatment of MRSA in HCAP is opinion based and should be treated with Vancomycin or Linezolid.<sup>7</sup>

To minimize exposure to broad-spectrum antibiotics the concept of "De-escalation" has been formulated. It broadly engulfs the idea of discontinuation of some antibiotics, switching over from a broad to narrow spectrum antibiotic or discontinuation of antibiotics in absence of microbiological culture positive evidence.

Lower respiratory tract cultures are infrequently taken initially, while treatment is initiated on basis of most probable susceptible microbacteria. Thus De-escalation (modified or discontinued) is done three to seven days after initiation, on basis of clinical response to therapy i.e. usually when chest skiagram improves and respiratory rate returns to baseline.

With optimal selection of antibiotics, dose and duration of treatment an early response should be expected in three to seven days. Currently there is no data on duration of therapy in HCAP. The obvious benefits of a shorter therapy are lower cost, fewer adverse drug events and lesser chances of drug resistance.

## SUMMARY

- HCAP need therapy for multidrug resistant (MDR) pathogens.

- Appropriate Broad-spectrum antimicrobial therapy, in adequate doses should be given to high risk patients on basis of clinical criteria, pending microbiological culture reports.
- Delay in obtaining lower respiratory tract culture should not delay initiation of empirical therapy.
- Empirical therapy regimen should not include recently used antibiotic.
- De-escalation of antibiotics should be considered early.

## CONCLUSION

HCAP is a distinct pneumonia with an increased risk of MDR pathogens. Early identification of at risk patients, adequate and appropriate empirical therapy, reduces mortality and avoids overuse of antibiotics. Due to paucity of data much is still unknown about HCAP. Though severe CAP and HCAP are distinct entities in reference to MDR, but principles to treat are similar. Empirical therapy, de-escalation of antibiotic therapy and duration of treatment may have distinct views, but in absence of data prognosis remains good in their discretionary use. Large-scale, multicenter, observational, cohort studies with rigorous microbiological data are needed to standardize the guidelines for HCAP.

## REFERENCES

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