ORIGINAL RESEARCH PAPER
Volume - 10 | Issue - 11 | November - 2021 | PRINT ISSN No. 2277 - 8179 | DOI : 10.36106/ijsr
INTERNATIONAL JOURNAL OF SCIENTIFIC RESEARCH

A STUDY ON INCIDENCE AND CAUSATIVE FACTORS OF VENTILATOR ASSOCIATED PNEUMONIA

General Medicine

Dr. B. Anil Kumar Naik Postgraduate, Department of General Medicine, Alluri Sitarama Raju Academy of Medical Sciences, Eluru 534005, West Godavari district, Andhra Pradesh, India.

Dr. I S V Prakash Professor, Department of General Medicine, Alluri Sitarama Raju Academy of Medical Sciences Eluru-534005, West Godavari district, Andhra Pradesh, India.

Dr. P Bhaskar* Professor, Department of General Medicine, Alluri Sitararaju Academy of Medical Sciences Eluru - 534005, West Godavari district, Andhra Pradesh, India. *Corresponding Author

ABSTRACT

Introduction: Pneumonia is the second most common nosocomial infection in critically, affecting 27% of all critically ill patients. Pneumonia is defined as Nosocomial when it occurs more than 48 hours after the patient's admission to the hospital and when it was not in incubation at the time of hospitalisation. Ventilator Associated Pneumonia (VAP) is a subset of pneumonia and the term refers to nosocomial pneumonia in a patient on mechanical ventilator support (by endotracheal tube or tracheostomy) for greater than or equal to 48 hours.

Materials And Methods: A total of 50 patients satisfying all inclusion & exclusion criteria were included for the study from the population of patients who underwent mechanical ventilation in our medical intensive care unit & toxicology .The patients were visited on day 3 of mechanical ventilation for diagnosis of VAP according to the clinical criteria and also on day 7 for classifying into EOP & LOP, study is done at Alluri Sitarama Raju Academy of Medical Sciences, Eluru, From August 2019 to July 2020.

Aims And Objectives: To study the incidence and aetiology of VAP , To analyse the underlying risk factors for VAP, To study the percentage of early and late onset pneumonia in these patients, To study the morbidity and mortality attributed by VAP

Results: out of 50 ICU cases selected 22 cases had identified with VAP and 28 were without VAP, and majority are of age group between 31 to 60 years (59.09%), and mortality is also more in the same age group (71.42%)

Conclusion: Method of intubation emergency or elective did not change the incidence of VAP,The incidence of VAP increases with the duration of mechanical ventilation, Diabetes is one of the major risk factor to develop VAP, Duration of stay in ICU patients with VAP very much pronged unlike in N- VAP.

KEYWORDS

INTRODUCTION:

Pneumonia is the second most common nosocomial infection in critically, affecting 27% of all critically ill patients. Pneumonia is defined as Nosocomial when it occurs more than 48 hours after the patient's admission to the hospital and when it was not in incubation at the time of hospitalisation. Ventilator Associated Pneumonia (VAP) is a subset of pneumonia and the term refers to nosocomial pneumonia in a patient on mechanical ventilatory support (by endotracheal tube or tracheostomy) for greater than or equal to 48 hours.

Ventilator-associated pneumonia (VAP) continues to be a major threat to patients admitted in intensive care units (ICU) and receiving mechanical ventilation (MV). Eighty-six percent of nosocomial pneumonias are associated with mechanical ventilation and are termed ventilator-associated pneumonia (VAP). A VAP arising 48 to 96 hours after tracheal intubation usually is called “early-onset VAP”, and the one that occurs after this period as the “late-onset VAP” .Generally, early-onset VAP has a better prognosis and is more likely to be caused by aspiration of antibiotic-sensitive bacteria colonizing the oropharynx.

Late-onset VAP may becaused by more unusual or multidrug-resistant (MDR) pathogens and is associated with greater morbidity and mortality. Endotracheal intubation has been identified as a risk factor for developing VAP.

Critically ill patients who are intubated for more than 24 hours were found to be at 6 to 21 times higher risk of developing ventilator-associated pneumonia and those patients intubated for less than 24 hours are at 3 times the risk of VAP , compared to non-intubated patients.

Other risk factors for VAP include decreased level of consciousness, gastric distention, and presence of gastric or small intestine tubes, trauma, or COPD.

VAP is reported to occur at rates of 10 to 35 cases / 1000 ventilator days, depending on the clinical situation. Aspiration of oral and /or gastric fluids is recognized to be an essential step in the development of VAP. Pulmonary aspiration is increased by supine positioning and pooling of secretions above the ET tube cuff.

Estimates of attributable mortality are variable, but increased duration of ventilation is a consistent finding, along with the corresponding increase in hospital days and cost. A major component of the problem is the ineffectiveness of therapy once VAP is diagnosed. Brun-Buisson et al have demonstrated failure rates of 49 to 62% despite the use of standard antibiotic combinations. Given the burden of VAP, both physical and financial, and the difficulties in treatment, prevention strategies would appear to be of paramount importance.

MATERIALS AND METHODS:

A total of 50 patients satisfying all inclusion & exclusion criteria were included for the study from the population of patients who underwent mechanical ventilation in our medical intensive care unit & toxicology .The patients were visited on day 3 of mechanical ventilation for diagnosis of VAP according to the clinical criteria and also on day 7 for classifying into EOP & LOP, study is DONE AMONG THE PTS IN ICU at Alluri Sitarama Raju Academy of Medical Sciences, Eluru, from August 2019 to July 2020.

AIMS AND OBJECTIVES:

To study the incidence and aetiology of VAP
To analyse the underlying risk factors for VAP
To study the percentage of early and late onset pneumonia in these patients
To study the morbidity and mortality attributed by VAP

Inclusion Criteria:

Patients who were admitted and underwent mechanical ventilation for 48 hrs in medical intensive care and toxicology unit age > 12 yrs.

Exclusion Criteria:

Age < 12 yrs
Patients who have got lower respiratory tract infection on admission
Pulmonary tuberculosis
COPD
ARDS

Bronchial asthmatics

RESULTS:

out of 50 icu cases selected 22 cases had identified with VAP and 28 were without VAP, and majority are of age group between 31 to 60 years(59.09%) , and mortality is also more in the same age group(71.42%)

Table 1: Incidence Of VAP

	NO OF PATIENTS	PERCENTAGE
VAP	22	44
N- VAP	28	56
TOTAL	50	100

Table 2: Age Distribution Of Cases

S NO	AGE	NUMBER	PERCENTAGE
1	0-30YEARS	7	31.81%
2	31 TO 60YEARS	13	59.09%
3	>60YEARS	2	9.10%

Majority of patients were in the group of 31 – 60 years. The number of people between 31 – 60 years accounts for 59%.

Table 3: Method Of Intubation

	FREQUENCY	PERCENTAGE
ELECTIVE	50	50%
EMERGENCY	50	50%

In our study 50% of patients underwent elective and 50% patients underwent emergency distribution.

Table 4: X-ray Finding In The Cases

S NO	LOBAR DISTRIBUTION	FREQUENCY	PERCENTAGE
1	RIGHT SIDE	15	68.18%
2	LEFT SIDE	3	13.63%
3	BILATERAL	4	18.18%

In majority of over cases, the CXR infiltrate was in the Right lung which comes around 68.2%.

Table 5: Profile Of Organism

	FREQUENCY	PERCENTAGE
GRAM NEGATIVE	13	59.0%
GRAM POSITIVE	5	22.7%
POLYMICROBIAL	4	18.3%

The percentage of gram negative organisms (59.9%), gram positive (22.7%) & polymicrobes (18.3%).

The organisms found in cultures in the descending frequency were pseudomonas, MRSA, Polymicrobial followed by acinetobacter.

Table 6: EOP Vs LOP

	FREQUENCY	PERCENTAGE
EARLY VAP	8	36.4%
LATE VAP	14	63.4%

The percentage of EOP & LOP is 36.4% and 63.4% respectively.

DISCUSSION:

1. Incidence of VAP in our hospital is 44% ,where as in united states VAP occurs in up to 25% of all people who require mechanical ventilation.
2. Age distribution : The percentage of patients with VAP in different age groups is as follows 60years-9.1% The higher incidence in the age group (31-60) can be attributed to more number of patients getting admitted &undergoing ventilation in this age group.It may also be due to their associated co morbid conditions.
3. Sex distribution: In our .hospital two third of the cases were males (63.6%) remaining cases one third were (36.4%) females.
4. Method of intubation : There is equal incidence of VAP in both elective& emergency intubation
5. Chest X-ray infiltrates : In our study 68.2%of patients had infiltrates in right lung.13.6%of patients in the left lung 18.2% bilaterally . The higher percentage of infiltrates in the right lung lower lobe is because of aspiration being the most common precipitating factor for VAP. Autopsy studies by Marquette, C. H., M. C. Copin, F. Wallet, R. Neviere, F. Saulnier, D. Mathieu, A. Durocher, P. Ramon, and A. B. Tonnel. 1995 have indicated that VAP frequently involves posterior right lower lobe.
6. Types of VAP: The percentage of patients with early onset VAP is 36%, late onset VAP is 63.4%.This is because probability of getting VAP increases with the duration of mechanical ventilation. Langer, Mosconi, Cigada, & Mandelli (1989) analyzed the relationship between artificial ventilatory support and pulmonary infection in 724 critically ill patients who had received prolonged (greater than 24 h) ventilatory assistance since admission to ICU. They found that the risk for VAP increased from 5% in patients receiving one day of respiratory assistance to 68.8% in patients receiving more than 30 days.

CONCLUSION:

1. Method of intubation emergency or elective did not change the incidence of VAP.
2. The incidence of VAP increases with the duration of mechanical ventilation.
3. Aspiration is major precipitating factor for developing VAP.
4. High incidence of MDR organisms in patients with VAP unlike in community acquired pneumonia.
5. Diabetes is one of the major risk factor to develop VAP
6. Duration of stay in ICU patients with VAP very much pronged unlike in N- VAP .

REFERENCES:

1. Gallego, M., and J.Rello. 1999. Diagnostic testing for ventilator-associated pneumonia. Clin. Chest Med. 20:671 Kollef, MH. (2005).
2. "What is ventilator-associated pneumonia and why is it important?". RespirCare 50: 714–21; discussion 721-679.
3. Richards, M. J., J. R. Edwards, D. H. Culver, R. P. Gaynes, et al. 1999. Nosocomial infections in medical intensive care units in the United States. Crit. Care Med. 27:887-892.
4. Marquette, C. H., F. Herengt, D. Mathieu, F. Saulnier, R. Courcol, and P. Ramon. 1993. Diagnosis of pneumonia in mechanically ventilated patients. Repeatability of the protected specimen brush. Am. Rev. Respir. Dis. 147:211-214.
5. McEachern, R., and G. D. Campbell, Jr. 1998. Hospital-acquired pneumonia: epidemiology, etiology, and treatment. Infect. Dis. Clin. N. Am. 12:761-779.
6. Craven, D. E., L. M. Kunches, V. Kilinsky, D. A. Lichtenberg, B. J. Make, and W. R. McCabe. 1986. Risk factors for pneumonia and fatality in patients receiving continuous mechanical ventilation. Am. Rev. Respir. Dis. 133:792-796.
7. Cunnion, K. M., D. J. Weber, W. E. B.//.roadhead, L. C. Hanson, C. F. Pieper, and W. A. Rutala. 1996. Risk factors for nosocomial pneumonia: comparing adult critical-care populations. Am. J. Respir. Crit. Care Med. 153:158162.
8. Papazian, L., F. Bregeon, X. Thirion, R. Gregoire, P. Saux, J. P. Denis, G. Perin, J. Charrel, J. F. Dumon, J. P. Affray, and F. Gouin. 1996. Effect of ventilator-associated pneumonia on mortality and morbidity. Am. J. Respir. Crit. Care Med. 154:91-97.
9. Kappstein, I., G. Schulgen, U. Beyer, K. Geiger, M. Schumacher, and F. D.Daschner. 1992. Prolongation of hospital stay and extra costs due to ventilatorassociated pneumonia in an intensive care unit. Eur. J. Clin. Microbiol. Infect. Dis. 11:504-508.
10. American Thoracic Society. 1996. Hospital-acquired pneumonia in adults: diagnosis, assessment of severity, initial antimicrobial therapy, and preventive strategies. A consensus statement, American Thoracic Society, November 1995. Am. J. Respir. Crit. Care Med. 153:1711-1725
11. Fartoukh, M., B. Maitre, S. Honore, C. Cerf, J. R. Zahar, and C. BrunBuisson. 2003. Diagnosing pneumonia during mechanical ventilation: the clinical pulmonary infection score revisited. Am. J. Respir. Crit. Care Med. 168:173-179.
12. Bryan, C. S. 1999. Nosocomial pneumonia: blood cultures remain useful. Chest 116:859-860.
13. American Thoracic Society. 1996. Hospital-acquired pneumonia in adults: diagnosis, assessment of severity, initial antimicrobial therapy, and preventive strategies. A consensus statement, American Thoracic Society, November 1995. Am. J. Respir. Crit. Care Med. 153:1711-1725
14. 65.Fartoukh, M., B. Maitre, S. Honore, C. Cerf, J. R. Zahar, and C. BrunBuisson. 2003. Diagnosing pneumonia during mechanical ventilation: the clinical pulmonary infection score revisited. Am. J. Respir. Crit. Care Med. 168:173-179.
15. Bergmans, D. C., M. J. Bonten, P. W. De Leeuw, and E. E. Stobberingh. 1997. Reproducibility of quantitative cultures of endotracheal aspirates from mechanically ventilated patients. J. Clin. Microbiol. 35:796-798.
16. Cook, D., and L. Mandell. 2000. Endotracheal aspiration in the diagnosis of ventilator-associated pneumonia. Chest 117:195S-197S.
17. Jorda, R., F. Parras, J. Ibanez, J. Reina, J. Bergada, and J. M. Raurich. 1993. Diagnosis of nosocomial pneumonia in mechanically ventilated patients by the blind protected telescoping catheter. Intensive Care Med. 19:377-382.
18. Chastre, J., J. Y. Fagon, M. Bornet-Lecso, S. Calvat, M. C. Dombret, R. al Khani, F. Basset, and C. Gibert. 1995. Evaluation of bronchoscopic techniques for the diagnosis of nosocomial pneumonia. Am. J. Respir. Crit. Care Med. 152:231240.
19. Gerbeaux, P., V. Ledoray, A. Boussuges, F. Molenat, P. Jean, and J. M. Sainty. 1998. Diagnosis of nosocomial pneumonia in mechanically ventilated patients: repeatability of the bronchoalveolar lavage. Am. J. Respir. Crit. Care Med. 157:76-80.