A CLINICAL STUDY OF VENTILATOR ASSOCIATED PNEUMONIA

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ABSTRACT

Background : Ventilator Associated Pneumonia is a significant cause of mortality and morbidity in the critical care setting. Ventilator Associated Pneumonias are highly preventable owing to identification of risk factors, causes and best practices in the ICU.

Aims and Objectives : The present study is aimed at determining the incidence of Ventilator Associated Pneumonia and their associated risk factors.

Materials & Methods : The present hospital based observational study included 50 cases on ventilator support from the ICU of Apna Hospital, Hyderabad. All the cases were included after consent and underwent detailed history taking, relevant clinical examinations and necessary laboratory investigations. The incidence of VAP's was determined and the data was analysed to find the related factors. Data was collected in MS Excel, presented in as numbers and percentages in the form of tables and charts.

Results : The incidence of Ventilator Associated Pneumonia was found to be 38%. Early Onset VAP was estimated to be 47.3%, Late Onset VAP to be 52.7%. There was male predominance(64%) in our study group. Age groups 40-60 years contributed the most of the study population. Diabetes, Hypertension, CVD, alcoholism and tobacco use were associated in VAP cases.

Conclusion : There is a high incidence of Ventilator Associated Pneumonia in the critical care setting. Further research should be conducted to evaluate the causes and detailed risk factors as Ventilator Associated Pneumonia are a major cause of mortality, morbidity and increase the financial burden of the patient and the hospital.

Key Words : Ventilator Associated Pneumonia, Critical Care, ICU, Incidence

INTRODUCTION

Ventilator Associated Pneumonias are a major challenge for the critical care physicians as they are a significant cause of mortality. The prevalence of Ventilator Associated Pneumonias is estimated to be around 30% among intubated patients[1]. Ventilator Associated Pneumonias are highly preventable owing to identification of risk factors, causes and best practices in the ICU.

Ventilator Associated Pneumonia is defined as an ICU acquired pneumonia occurring within 72 hours of mechanical ventilation. According to the Centre for Diseases Control (CDC), USA, the criteria for diagnosis of Ventilator Associated Pneumonia include mechanical ventilation within 24 hours, lung infiltrates on radiographs, fever, leukopenia or leukocytosis and culture positive endotracheal aspirates. Ventilator Associated Pneumonia can be classified as Early onset VAP and Late onset VAP. Early onset VAP is defined as the one occurring in the first four days of ICU intubation. Late onset VAP is defined as VAP occurring at fifth day or thereafter of mechanical ventilation. Early onset VAP has been identified to be caused by antibiotic sensitive micro-organisms and to have a better prognosis. Late onset VAP has been linked with drug resistant variants and increased mortality.[2] There is no identified gold standard for diagnosis of Ventilator Associated Pneumonia which is a cause of poor outcomes and increased mortality.

The present study was thus undertaken to determine the incidence of Ventilator Associated Pneumonia and their associated risk factors in our setting.

MATERIALS AND METHODS

Study Design : The present study was a hospital based observational study.

Study Setting : The present study was conducted at the ICU, Critical Care Unit of Apna Hospital, Hyderabad, Telangana.

Sample Size : 50 ICU patients who underwent endotracheal intubation and mechanical ventilation were included in the study.

Inclusion Criteria : All intubated patients in ICU on mechanical ventilation for more than 48 hours.

Exclusion Criteria : Cases with lung diseases and pneumonia prior to mechanical ventilation/ICU admission.
All the cases were included after consent and underwent detailed history taking, relevant clinical examinations and necessary laboratory investigations. The incidence of VAP's was determined and the data was analysed to find the related factors.

Statistical Analysis : Data was collected in MS Excel, presented in as numbers and percentages in the form of tables and charts.

RESULTS

Table No. 1 Gender Distribution

Gender	No. Of Patients
Male	**32(64%)**
Female	**18(36%)**

Male cases were higher and accounted for 64% of the total study group.

Table No. 2 Age Distribution

Age Group	No. Of Cases
20-40 Years	16(32%)
41-60 Years	28(56%)
>60 Years	6(12%)

Most of the cases belonged to the age group 41-60 years. The elder population, above 40 years comprised of most of the cases.

Table No. 3 Incidence Of VAP

Group	No. Of Cases
VAP	19(38%)
No VAP	31(62%)

The incidence of VAP in our study group was around 38% which accounted for 19 patients.

Table No. 4 Early Onset VAP vs Late Onset VAP

Group	No. Of Cases
Early Onset VAP	9(47.3%)
Late Onset VAP	10(52.7%)

There was an almost even distribution of early onset VAP and late onset VAP among the total VAP cases.

Table No. 5 Associated Factors

Factor	VAP Group
Diabetes	11(57.8%)
Hypertension	7(36.8%)
CVD	5(26.3%)
Lung Disease	5(26.3%)
Renal Disease	4(21.0%)
Alcoholism	10(52.6%)
Tobacco Use	8(42.1%)

The associated factors in the Ventilator Associated Pneumonia have been depicted in the above table.

DISCUSSION

The present study was a hospital based observational study which aimed at determining the incidence of Ventilator Associated Pneumonia in the critical care units ICU. The incidence of Ventilator Associated Pneumonia in our study was found to be 38%. Similar results were obtained in a study conducted by D. Mohanty and colleagues[3]. In a study by S. Golia[4] the incidence of Ventilator Associated Pneumonia was found to be 35%. An incidence of 38% was also reported in a study by Mathai and colleagues[5]. Hina Gadani and co[6] also studied Ventilator Associated Pneumonia in Indian setting and their results depict an incidence of 37% among the 100 patients they studied. In our study 64% of the total subjects were males. Similar results have been obtained by a few other studies[7]. The elder age groups, above 40 years were the ones to be affected the most. Ventilator Associated Pneumonia can be classified as Early onset VAP and Late onset VAP. Early onset VAP is defined as the one occurring in the first four days of ICU intubation. Late onset VAP is defined as VAP occurring at fifth day or thereafter of mechanical ventilation. Early onset VAP has been identified to be caused by antibiotic sensitive micro-organisms and to have a better prognosis. Late onset VAP has been linked with drug resistant variants and increased mortality. In our study Early Onset VAP and Late Onset VAP were evenly distributed, their frequency being 47.3% and 52.7% respectively. In our study, the VAP group, 58% were diabetics, 37% were hypertensives, 26% had lung diseases(chronic). Alcoholism and tobacco use were also common habits in those who acquired Ventilator Associated Pneumonia.

CONCLUSION

There is a considerable incidence of Ventilator Associated Pneumonia in the critical care setting. Further research should be conducted to evaluate the causes and detailed risk factors as Ventilator Associated Pneumonia are a major cause of mortality, morbidity and increase the financial burden of the patient and the hospital.

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