

An audit of Knowledge and care of ventilator associated Pneumonia in Intensive care setup

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IK HMM conceived idea, IK MMSI drafted the study, HMM MMS collected data, HMM IK did statistical analysis & interpretation of data, IK MMS critical reviewed manuscript, All approved final version to be published.

Declaration of conflicting interests

The Authors declares that there is no conflict of interest.

Abstract

Background: Ventilator associated pneumonia is an important intensive and long term care related issue. It is equally important that the staff working with ventilated patients be aware of the recommended practices to prevent and treat ventilator associated pneumonia.

Methodology: This Cross-sectional descriptive study was conducted at Al Mana General hospital, Kingdom of Saudi Arabia from 1st October 2018 to 31st December 2018. All the doctors, respiratory therapists and nurses working in the intensive care setups and long term care setup were included in the study. A preformed questionnaire was given before and after and educational activity and the knowledge level of the all participants recorded. Data was analyzed using IBM SPSS Statistics for Windows, Version 23.0. Armonk, NY: IBM Corp.

Results: A total of 50 participants were included in the study. There were 10 (20%) respiratory therapists, 15 (30%) doctors and 25 (50%) nurses. The mean percent score of all the participants before the activity was $36.7 \pm 12.84\%$ and after the activity $73.6 \pm 10.6\%$ ($p=0.005$). The mean score on the knowledge part of the questionnaire was $25.5 \pm 13.5\%$ before the educational activity and $74.8 \pm 9.3\%$ after the activity ($p=0.002$). Mean score of knowledge of VAP was ($26.7 \pm 13.07\%$ and $76.5 \pm 10\%$ ($p=0.003$)) before and after the educational activity.

Conclusion: Frequent educational activities and teaching is important to keep the staff updated about the knowledge and practice of ventilator associated pneumonia.

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Introduction

Mechanical ventilation has revolutionized the care of critically ill patients. The evolution of mechanical ventilator itself is a success story of the advancements in medicine. Mechanical ventilators are being used routinely in various types of intensive care setups. But they are not without complications. Long term use of mechanical ventilators leads to many complications including ventilator associated infections, notably ventilator associated pneumonia (VAP).¹⁻³ VAP is associated with increased length of stay in the hospital, increased mortality and

has high cost implications. Patients on mechanical ventilators die of many reasons but the attributable mortality because of VAP is estimated to be around 10%.⁴ Various international bodies have recommended different definitions and care bundles for better understanding, preventing and treatment of VAP. Measuring process and outcome measures enhances awareness, establishes expectations, creates urgency, and rewards changes in behavior.

This audit was conducted to find out the knowledge and practices of prevention regarding VAP in our hospital.

Methodology

This cross-sectional descriptive study was conducted at Al Mana General hospital, Kingdom of Saudi Arabia from 1st October 2018 to 31st December 2018. The study population included all the health care staff involved in the care of ventilated patients in cardiothoracic intensive care unit, general surgical intensive care unit and long-term care unit where patients with long term mechanical ventilator are frequently admitted. The staff included nurses, respiratory therapists and doctors.

A preformed questionnaire that encompassed various aspects of the knowledge, prevention and care of VAP was devised. The questionnaire was divided into a 'Knowledge' part and a 'Practice' part. The responses of all the participants were separately recorded on both the parts.

After the first response, an educational programme about VAP was devised that included on floor lectures, hand-outs and presentations. All the participants took part in the educational programme. Participants were educated about the various aspects

Table 1: A comparison of the mean scores of study cases

Participants	Mean Percent score before the educational activity	Mean percent score after the educational activity	P value
Doctors 15 (30)	37.6 ± 11.15%	77.0 ± 9.0%	0.003
Nurses 25 (50%)	36.2 ± 14.08%	75.2 ± 9.8%	0.005
Respiratory therapists 10 (20%)	36.5 ± 13.1 %	64.5 ±10.39%	0.002
Mean score of all the participants	36.7 ± 12.84%	73.6 ± 10.6%	0.005
Percent mean score or practice	26.7 ± 13.07%	76.5 ± 10 %	0.003
Percent mean score of knowledge	25.5 ± 13.5%	74.8 ± 9.3 %	0.002

of VAP. At completion of the programme, a repeat questionnaire was given to all the participants and the response recorded.

The pre and post programme data was analyzed using IBM SPSS Statistics for Windows, Version 23.0. Armonk, NY: IBM Corp. The scores of the groups before and after the educational activity were presented as mean of the present score. A Wilcoxon sign rank sum test was used to compare the means of the variables pre and post educational activity. A two tailed p valve less than 0.05 was considered as

significant.

Results

A total of 50 participants took part in the activity. This included 10 (20%) respiratory therapists, 15 (30%) doctors and 25 (50%) nurses. All the participants (100%) returned the questionnaire. The mean percent score of all the participants before the activity was 36.7±12.84% and after the activity 73.6±10.6% (p=0.005) (table.1). all the three categories of participants made significant improvement after the

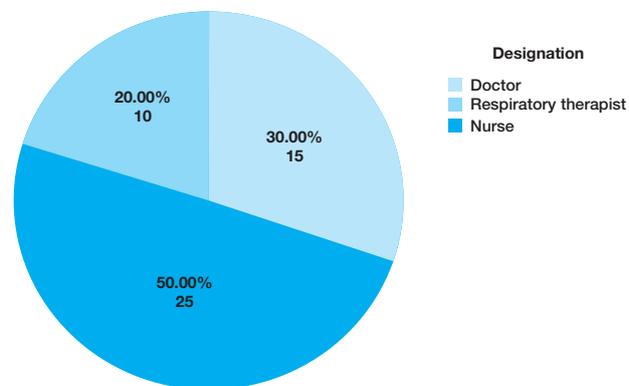


Fig. 1 Pie chart showing the number of participants involved.

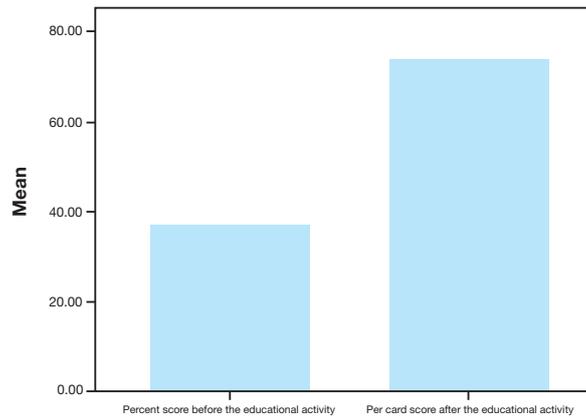


Fig. 2. Bar graph showing the mean score of all the participants with respect to the timing of the educational activity.

educational activity. Doctors scored a mean of $37.6 \pm 11.15\%$ and $77.0 \pm 9.0\%$ ($p=0.003$) before and after the programme respectively. Similarly nurses improved their score from $36.2 \pm 14.08\%$ to $75.2 \pm 9.8\%$ ($p=0.005$) and respiratory therapists from $36.5 \pm 13.1\%$ to $64.5 \pm 10.39\%$ ($p=0.002$) (table.1).

The mean score on the knowledge part of the questionnaire was $25.5 \pm 13.5\%$ before the educational activity and $74.8 \pm 9.3\%$ after the activity ($p=0.002$). Similarly, there was a significant difference between the mean score for the practice part before and after the educational activity for all the participants ($26.7 \pm$

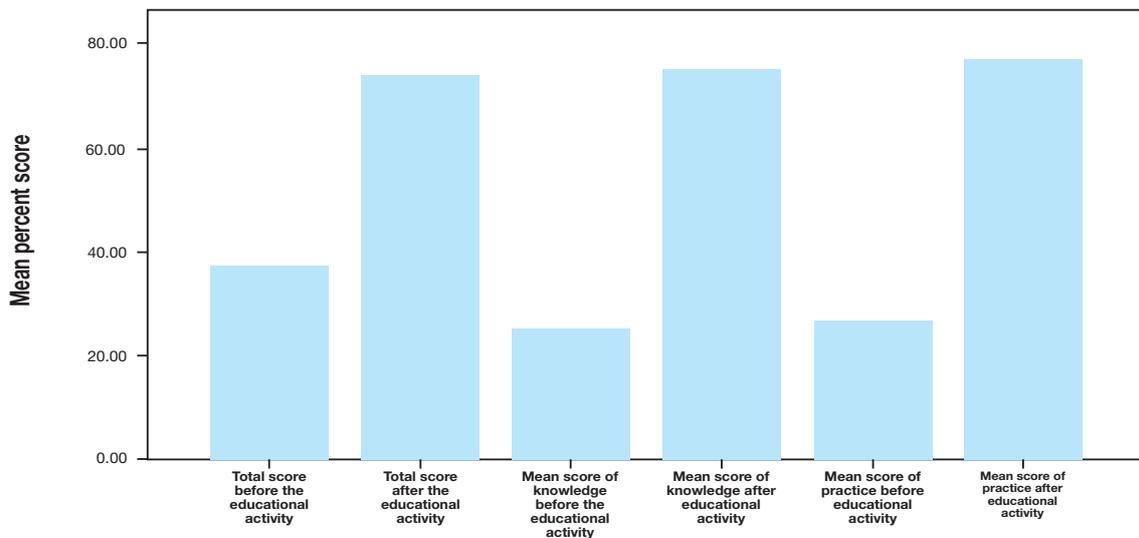


Fig. 3: Bar graph showing the mean scores before and after the educational activity.

13.07% and $76.5 \pm 10\%$ respectively, ($p=0.003$) (Fig. 1, 2 and 3).

Discussion

Ventilator associated pneumonia remains a challenge in terms of morbidity and mortality and increasing the cost of health care.¹ The prevention and treatment of VAP has been widely discussed in literature. VAP prevention bundles are in use in intensive care units throughout the world.³ The four important components of the VAP bundles for prevention are elevation of head end of the bed to 30° - 45° , daily sedation vacation, deep venous thrombosis prophylaxis and

stress ulcer prophylaxis, subglottic secretion drainage and daily mouthcare with chlorhexidine.³

Wip and colleagues showed that VAP bundles are effective in reducing ventilator associated pneumonia in intensive care settings.³ Conditions that may mimic VAP are acute respiratory distress syndrome, tracheobronchitis, pulmonary edema and pulmonary contusion.^{6,7} It is therefore important that a health care personnel is aware of the signs and symptoms of VAP for prevention and effective management.

Our study showed that inspite of an institutional protocol in place, a proper educational activity was

necessary to update the knowledge of the staff. Continuous educational programmes targeting specific health issues for the staff play an important role in their capacity building to better look after their patients. Our results showed that the targeted programme improved the knowledge of the staff regarding this condition. Klompas and colleagues showed that ongoing focus on the issue and staff education helps in achieving a better compliance with recommended practices.⁵ The significant improvement in the knowledge and understanding of the study cohort in our study showed the importance of ongoing awareness and educational campaigns especially for intensive care staff. Examples of educational materials include pocket cards, brochures, posters, fact sheets, daily guides, guideline summaries, flow sheets and 1-page bulletins.⁶

Conclusion

Ventilator associated pneumonia had important health care and cost burden implications. In spite of standard protocols being in place, the knowledge of the related staff needs to be refreshed and updated on regular basis.

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