

Preventing Ventilator Associated Pneumonia

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BACKGROUND/SIGNIFICANCE

- Ventilator associated pneumonia (VAP) is a significant nosocomial infection threat to ICU patients (Huang et al., 2018).
- VAP is associated with increased mortality rates, length of stay, and overall cost of care (Al-Abdely et al., 2018).
- Implementation of a prevention protocol could be proved effective to reducing instances of VAP.

CLINICAL QUESTION

In ventilated adult ICU patients, is implementing a ventilator protocol more effective at preventing or reducing ventilator associated pneumonia?

SEARCH STRATEGY

- **KEYWORDS:** ventilator associated pneumonia, ventilator acquired pneumonia, ICU, prevention, guidelines
- **DATABASES:** CINAHL Complete, PubMed, and Cochrane Library
- **EXCLUSIONS:** children, patients already diagnosed with VAP, and articles older than 5 years.



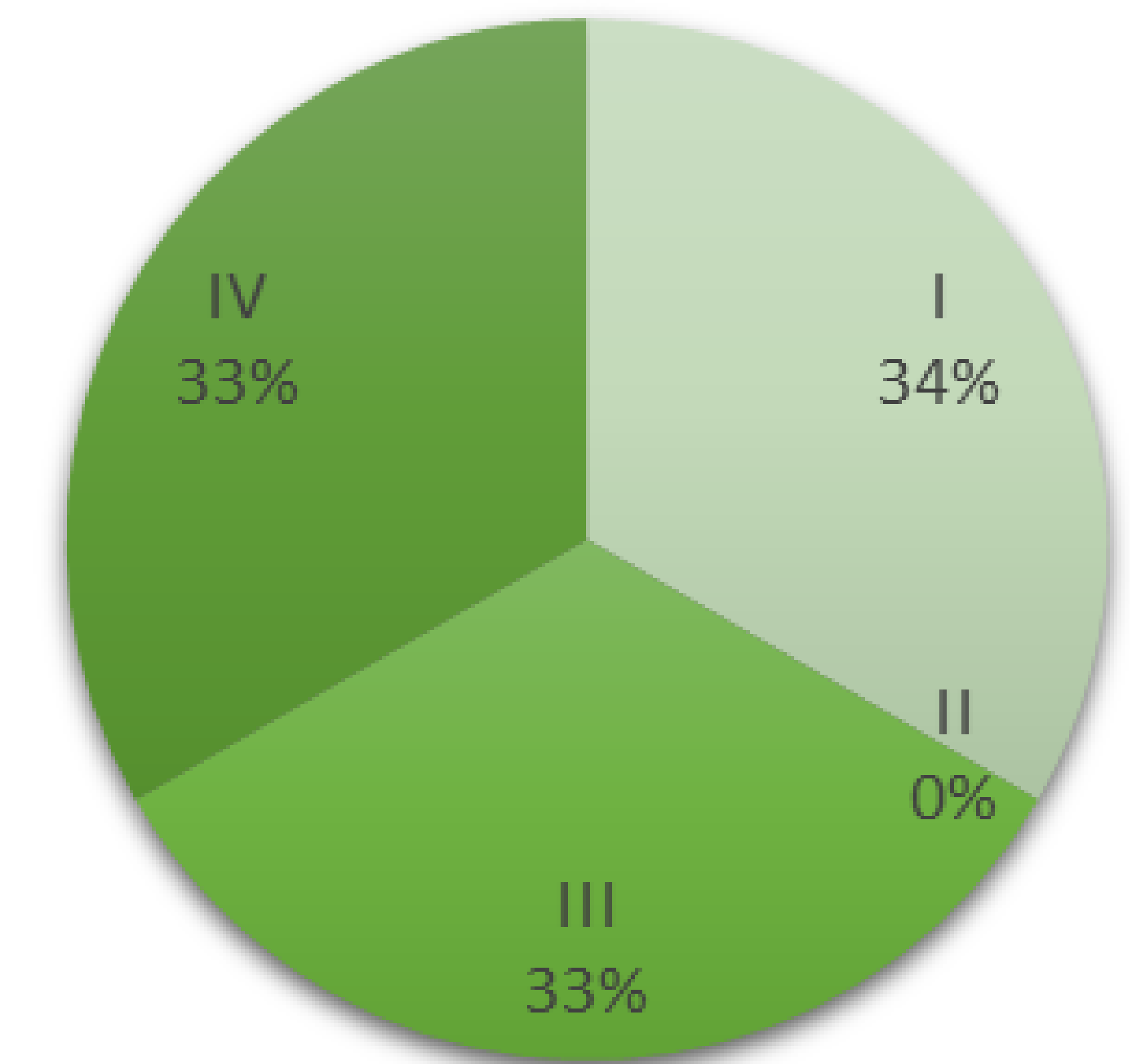
SYNTHESIS OF THE EVIDENCE

Article #	Author & Date	Evidence Type	Sample Size	Study Findings that help answer the question	Limitations	Level/Quality
1	Al-Abdely et al, 2018	Prospective cohort	14,961 patients in 37 ICUs	VAP reduced from 7.84 to 4.74 per 1000 MV-days with INICC VAP bundle	Small portion of all hospitals in country. Possible short baseline period. Level of quality control. Lack of control group. Baseline includes preventions.	IV/A
2	Alvarez Lerma et al, 2014	Prospective cohort	“huge, multicenter”	7 basic mandatory measures and 3 highly recommended measures identified as beneficial to reducing VAP	Related to “study” design and absence of site monitoring.	IV/A
3	Huang et al, 2018	Quasi-experimental, uncontrolled, before-and-after study	1262 ventilator sessions >48h in one ICU	Multifaceted prevention program reduces VAP rates	Not randomized. Not blinded. Compliance not measured with each patient each day.	III/B
4	Landelle et al, 2018	Meta-analysis	Nine RTCs	Decrease in VAP caused by Gram-positive cocci and <i>H influenzae</i>	Not randomized. Not blinded. Compliance not measured. Study performed in single center. Possible regression of mean.	I/B
5	Li et al, 2013	Meta-analysis and systematic review	16 RTCs	Significant reduction in VAP with oral decontamination	Sample sizes of RTCs small. High heterogeneity. Potential publication bias.	I/A
6	Wolfensberger et al, 2018	Mixed method study with focus group interviews	64 ICU beds	Technical solutions should be promoted to improve VAP	Convience sampling of HCPs, possible behavior modification due to observation.	III/B

FINDINGS

- Single preventative measures have not been found to be statistically significant.
- VAP prevention protocol bundles significantly reduce the instance of VAP in ventilated ICU patients. Li et al. (2013) determined that their bundled prevention program resulted in an 85% decrease in VAP rates.
- The elements of successful bundles include effective hand hygiene prior to initiating care for the endotracheal tube, comprehensive oral care, elevation of the head of the bed, daily sedation interruption (to evaluate the patient’s readiness to be weaned from mechanical ventilation), control of endotracheal cuff pressure, and subglottic suctioning.

Level of Evidence



IMPLICATIONS FOR PRACTICE

- Facilities should evaluate the effectiveness of their current protocol and consider the need for additional preventative measures. Or simply consider instituting a VAP protocol if none exists.
- Facilities should monitor education and adherence to implemented protocols.
- Further research needs to be completed on the potential harmful effects of different types of oral decontaminates for total oral care.

Summary

- The use of bundled VAP protocols can significantly reduce the instances of VAP in ICU patients.
- Education for all clinical staff will improve adherence to VAP protocols and therefore improve VAP rates.