Ventilator Associated Pneumonia in Geriatric Intensive Care Unit

Thesis
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الألتهاب الرئوى المصاحب لجهازالتنفس الصناعى فى وحدة الرعاية المركزة للمسنين

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List of Errata

Page	Line	Written	Correct
31	**21**	pneumonia	pneumoniae
	22	Methicilin	Methicillin
32	**7**	Methicilin	Methicillin
33	**2**	aruginosa	aeruginosa
	14	Staphlococcus	Staphylococcus
	17	Pseudomoas	Pseudomonas
89	**Table (17)**	Cephalosporines	Cephalosporins
91	**2**	Tetracyclins	Tetracyclines
	3	Klebsilla	Klebsiella
	4	Carbapenam	Carbapenem
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	19	Carbapenams	Carbapenems
	22	Tetracyclins	Tetracyclines
96	**3, 22**	Carbapenams	Carbapenems
	4, 20	Tetracyclins	Tetracyclines
	11, 18	Pipercillin	Piperacillin
	12	Ceftrioxone	Ceftriaxone
	12, 17	Cefeperazone	Cefoperazone
	13, 18	Ceftizidime	Ceftazidime
	21	Klebsilla	Klebsiella
97	**7**	Klebsilla	Klebsiella
98	**16**	stoke	Stroke
	19	Acintobacter	Acinetobacter
	19	Klebsilla	Klebsiella
99	**5**	speciemen	Specimens
102	**12**	assosciated	associated
103	**11, 13**	Acintobacter	Acinetobacter
104	**2**	Acintobacter	Acinetobacter

Contents

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List of Abbreviations

AACN	: American Association of Critical Care Nurses
ABG	: Arterial Blood Gases
ARDS	: Acute Respiratory Distress Syndrome
B	: Bronchoscopic
BAL	: Bronchoalveolar lavage
C.pneumoniae	: Chlamydophila pneumoniae
CAP	: Community Acquired Pneumonia
CDC	: Centers for Disease Control
CFU	: Colony Forming Unit
CLSI	: Clinical and Laboratory Standards Institute
CNS	: Central nervous system
COPD	: Chronic obstructive pulmonary disease
COV	: Corona virus
CPIS	: Clinical Pulmonary Infection Score
CRF	: Chronic renal failure
CXR	: Chest X-ray
DKA	: Diabetic ketoacidosis
DNA	: Deoxyribonucleic acid
E.coli	: Escherichia coli
ECG	: Electrocardiogram
Enterococcus spp	: Enterococcus species
ESBL	: Extended-spectrum β-lactamase
EIA	: Enzyme Immunoassay
ET	: Endotracheal
ETA	: Endotracheal aspirate
ETT	: Endotracheal tube
FAMA	: Fluorescent antibody staining of membrane antigen
Fio2	: Fraction of inspired oxygen
H.influenzae	: Haemophilus Influenzae
HA	: Haemagglutinin
HAP	: Hospital Acquired Pneumonia
Hb	: Hemoglobin
HBOV	: Human Bocavirus

HCOV	: Human Coronavirus
HIV	: Human Immunodeficiency virus
HMPV	: Human Metapneumovirus
HOB	: Head of bed
HRV	: Human Rhinovirus
HSV	: Herpes Simplex virus
ICAM	: Intracellular adhesion molecules
ICU	: Intensive Care Unit
IFA	: Immunofluorescence assay
IgG	: Immunoglobulin G
IHD	: Ischemic heart disease
L.bozemanae	: Legionella bozemanae
L.dumoffi	: Legionella dumoffi
L.longbeachae	: Legionella longbeachae
L.micdadei	: Legionella micdadei
LIA	: Lysine iron agar
LOS	: Lipopolysaccharide
LRT	: Lower respiratory tract
LRTI	: Lower respiratory tract infection
M.catarrhalis	: Moraxella catarrhalis
M.pneumoniae	: Mycoplasma pneumoniae
M2	: Matrix 2
MDR	: Multiple Drug Resistance
Mini-PBAL	: Mini Protected Bronchoalveolar lavage
MIO	: Motility Indole Ornithine
MRSA	: Methicillin Resistant Staphylococcus Aureus
MSSA	: Methicillin Sensitive Staphylococcus Aureus
NA	: Neuraminidase
NB	: Non Bronchoscopically
NP	: Nosocomial pneumonia
P.aeruginosa	: Pseudomonas aeruginosa
PaO_2	: Partial pressure of arterial oxygen
P-BAL	: Protected Bronchoalveolar lavage
PCR	: Polymerase Chain Reaction
PMN	: Polymorphonuclear cells
PNU	: Pneumonia

Psa	: Peptide permeases
PSB	: Protected specimen brushing
PTC	: Plugged Telescoping Catheter
PUO	: Pyrexia of Unknown Origin
QEA	: Quantitative endotracheal aspirate
RHD	: Rheumatic heart disease
RIA	: Radioimmunoassay
RNA	: Ribonucleic acid
RSV	: Respiratory Syncytial virus
RTA	: Road traffic accident
SARS	: Severe Acute Respiratory Syndrome
SDD	: Selective Decontamination of Digestive tract
Staph.aureus	: Staphylococcus Aureus
Strept.pneumoniae	: Streptococcus Pneumoniae
TLC	: Total Leucocytic Count
TSI	: Triple sugar iron
Vs	: Versus
VAP	: Ventilator Associated Pneumonia
WBCs	: White blood cells
WHO	: World Health Organization

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Introduction

Hospital-acquired pneumonia is the most common life-threatening hospital-acquired infection, and the majority of cases are associated with mechanical ventilation ***(Peleg and David, 2010).***

Ventilator associated pneumonia **(VAP)** occurs 48 hours after intubation and mechanical ventilation. It is a common infectious disease that is found in intensive care unit **(ICU)**, which occurs in 8-38% of patients who underwent mechanical ventilation. The incidence of pneumonia has been known to be higher in ICU patients than in general ward patients and even 3 ~ 10-fold higher in patients who underwent mechanical ventilation ***(Chi et al., 2012)***.

The time of onset of pneumonia is an important risk factor for specific pathogens and outcome in patients with VAP. Early onset VAP is defined as occurring within first 4 days of hospitalization, usually caused by antibiotic-sensitive bacteria, that is, community acquired, whereas the late onset, that is, more than 5 days is associated with increased mortality in patients. The emergence of multiple drug resistant pathogens is becoming a therapeutic challenge as the treatment alternatives

are unavailable, toxic, and with poor outcome ***(Jakribettu and Boloor, 2012).***

Mortality rates in patients with VAP range from 20 to 50% and may reach more than 70% when the infection is caused by multi-resistant and invasive pathogens. The incidence of VAP-attributable mortality is difficult to quantify due to the possible confounding effect of associated conditions, but VAP is thought to increase the mortality of the underlying disease by about 30%. VAP is also associated with considerable morbidity, including prolonged ICU length of stay, prolonged mechanical ventilation, and increased costs of hospitalization ***(Rea-Neto et al., 2012).***

Risk factors associated with VAP development were grouped into intrinsic factors (individual variable of age, co-morbidity, disease severity, etc.) and extrinsic factors (potential hospital environment risks, prior use of antibiotics, tracheal intubations, etc**.)** ***(Gatell et al., 2012).***

The detection of the causative organism in VAP is imperative for guiding an appropriate therapy as there is strong evidence of the adverse effect of inadequate empirical treatment on outcome ***(Badr et al., 2011).***

Consistent six organisms (*Staphylococcus aureus* [28.0%], *Pseudomonas aeruginosa* [21.8%], *Klebsiella* species [9.8%], *Escherichia coli* [6.9%], *Acinetobacter* species [6.8%], and *Enterobacter* species [6.3%]) caused ~ 80% of episodes, with lower prevalences of *Serratia* species, S*tenotrophomonas maltophilia*, and community-acquired pathogens, such as pneumococci and *Haemophilus influenzae* ***(Jones, 2010).***

A number of strategies have been proposed for VAP prevention; however, only a few have been demonstrated to be effective, and many others still need evaluation in large randomized clinical trials before definitive recommendations can be made. Among others, modifications to the endotracheal tube (ETT) (e.g., subglottic secretion drainage systems, antimicrobial coating, alternative cuff shapes and materials), continuous maintenance of proper cuff inflating pressures, ETT secretion removal, patient positioning in the lateral horizontal position, kinetic therapy, and administration of probiotics are measures worthy of consideration in the ongoing battle to reduce the rates of VAP ***(Coppadoro et al., 2012).***

Because VAP is a potentially severe illness, this infection must be treated as soon as possible if there is a strong suspicion