Approaches For Prevention And Management of Iatrogenic Complications in Intensive Care Units

Essay

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بسم الله الرحمن الرحيم

وقُلِ اعْمَلُوا فَسَيَرَى اللَّهُ عَمَلَكُمْ ورَسُولُهُ والْمُؤْمِنُونَ

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Diana Fouad Ali

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List of Abbreviations

Abb.	Full term
ACEI	: Angiotensin converting enzyme inhibitor
ADRs	: Adverse drug reactions
AEDs	: Anti epilepticus drugs
AEs	: Adverse events
AKI	: Acute kidney injury
ALF	: Acute liver failure
ARBs	: Angiotensin receptor blockers
ARDS	: Acute respiratory distress syndrome
ARF	: Acute renal failure
ATN	: Acute tubular necrosis
CAM-ICU	: Confusion Assessment Method for the ICU
cEEG	: Continuous Electroencephalogram
CIM	: Critical illness myopathy
CINM	: Critical illness neuromyopathy
CIP	: Critical illness polyneuropathy
COPD	: Chronic obstructive pulmonary disease
CT	: Computerized tomography
CVC	: Central venous catheter
DIT	: Drug induced thrombocytopenia
DDS	: Dialysis disequilibrium syndrome
ED	: Emergency department

EEG	: Electroencephalogram
EET	: Endotracheal tube
ETI	: Endotracheal intubation
FV	: Femoral vein
GABA	: Gamma aminobutyric acid
GTCS	: generalized tonic-clonic convulsions
HE	: Hepatic encephalopathy
HIT	: Heparin induced thrombocytopenia
ICDSC	: Intensive Care Delirium Screening Checklist
ICP	: Intra cranial pressure
ICU	: Intensive care unit.
ICU-AW	: ICU-Acquired Weakness
IJV	: Internal jugular vein
IVIG	: Intra venous immunoglobulin
MDR	: Multi drug resistant
MRC sum score	: Medical Research Council sum score
NCSE	: Non convulsive status epilepticus
NCSz	: Non convulsive seizures
ODS	: Osmotic demyelination syndrome
PA	: Pulmonary artery
PAC	: Pulmonary artery catheter
PEEP	: Positive end expiratory pressure
PN	: Parenteral nutrition
PrU	: Pressure ulcer

REM	: Rapid Eye movement
RRT	: Renal replacement therapy
RV	: Right ventricle
SCV	: Subclavian vein
TCY	: Thrombocytopenia
TPN	: Total parenteral nutrition
TI	: Tracheal intubation
TME	: Toxic metabolic encephalopathy
VALI	: Ventilator-associated lung injury
VAP	: Ventilator associated pneumonia
VILI	: Ventilator-induced lung injury
WE	: Wernicke's encephalopathy

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Introduction

The imagination of a nearly error-free modern medicine was challenged in many aspects during the last decades. Assessment and analysis of care errors is now considered as a basic element of clinical practice in all medical disciplines, not least in intensive care medicine. The very complex process of intensive care for the most severely ill patients is accompanied by an unexpected accumulation of risk for error and adverse events ***(Valentin, 2013)***.

Critically ill patients are highly vulnerable to medical errors, because they usually have both underlying co morbidities and acute organ dysfunctions. In addition, the life-sustaining treatments and highly technical routine care used in ICUs provide many opportunities for medical errors. Two types of medical errors and adverse events are reported: those related to medications, and those related to procedures or the ICU environment. Administering the right drug to the right patient at the right frequency in the right dose and via the right route represents a challenge for the nursing staff ***(Garrouste –Orgeas et al., 2012)***.

Several medical procedures are performed daily in the intensive care unit, and it is evident that complications resulting from these procedures still occur frequently and are potentially life-threatening, despite the attendance of relatively senior and experienced physicians and medical staff in the critical care setting. These complications may result from inadequate knowledge of anatomy, in adequate training or experience, urgent performance, exhausted personnel, or the severity of the patient's condition ***(Shen and Tu, 2013).***

It has been strongly advocated to design systems in such away as to protect ICU patients from preventable harm. This approach requires not this quintal implementation of single interventions but rather, a balanced interdisciplinary effort directed to process characteristics and execution of several measures in parallel. Care bundle sand multi faceted programs combine different components and measures, not least including an educational domain ***(Marsteller et al., 2012).***

The ultimate goal is not only to prevent harm to patients but even more to assure that every patient will receive timely and appropriate, evidence-based medical

care. Tools and measures to decrease care errors include new health care technologies, multifaceted programs and adaptation of working conditions to human limits. To develop a culture of safety based on open communication, anticipation of risks and effective teamwork constitutes the key element in this challenging but no longer ignorable evolution ***(Valentin, 2013)***

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Aim of the Work

The aim of this study is to discuss types, severity, prevention and management of the iatrogenic complications in the intensive care unit.

Overview

Neurologic complications in intensive care happen as the aftereffect of critical sickness, intensive care therapies and procedures, medical or surgical strategies; preoperatively; or in view of hidden essential neurologic disorder. These complications happen at greater frequency and are usually unrecognized because critically ill patients are mostly intubated, sedated, and/or receiving neuromuscular blocking agents ***(Barlas et al., 2001).***

Neurologic complications are associated with incremented disability, longer hospital stay, and incremented mortality. Patients developing neurological complications while in the medical ICU demonstrated an increased risk of hospital mortality when compared with patients who did not suffer such problems ***(Bleck, 2006).***

1-Altered mental status and coma

Altered mental status and coma are the most widely recognized neurologic complications in Intensive Care Units ***(Bleck et al., 1993).*** Iatrogenic causes of encephalopathy usually occur in ICUs and should be effectively prohibited.

Coma in the medical/surgical ICU is generally toxic/metabolic in nature and is frequently multi-factorial. Sepsis, hypotension, hypoxia, acid based disturbance, hypothermia, glucose and electrolyte abnormalities, and medications are the most widely recognized causes. Uremic failure and hepatic failure mostly contribute to coma. Primary central nervous system infections for example meningitis or encephalitis are less common, yet should be considered in the appropriate setting. If a severe coagulopathy is present, intracranial hemorrhage and subdural hematomas should be excluded. Focal signs on exam propose structural lesion such as a CNS infarction, abscess, or tumor, and should be assessed with a CT or MR1 scan. If no obvious cause for coma is evident, an electroencephalogram (EEG) to exclude non convulsive status is demonstrated ***(Bleck, 2006).***

Toxic-metabolic encephalopathy:

Toxic-metabolic encephalopathy (TME) is a condition of acute global cerebral dysfunction not because of primary structural brain disease. All forms of TME interrupt the function of the ascending reticular activating system and/or its projections to the cerebral cortex, consequently leading to disturbance of consciousness ***(Chen and Young, 1996).***