Common psychological problems in ICU

Essay
Of *Submitted in Partial Fulfillment of*
Master Degree in General Intesive Care

BY

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2014

Acknowledgement

*Many thanks to **Allah**, who granted me the ability to perform this Review.*

*I have the greatest pleasure to express my deepest gratitude to **Prof. Dr., Alla EL-Din Abd EL Wahab Koraa,** Professor of Anesthesia &Intensive care, Faculty of Medicine, Ain Shams University, for suggesting, planning the point of research and providing research facilities. His generous encouragement, supervision, reading and critical discussions during the writing and preparation of the manuscript of this thesis.*

*I wish also to express my sincere thanks to **Prof. Dr., Nohaa Mohamed El Sharnouby,** Professor Anesthesia &Intensive care, Faculty of Medicine, Ain shams University, for her supervision, continuous assistance, valuable support, unfailing interest in the progress of the work, her advice and critical review of the thesis.*

*Finally I wish also to express my sincere thanks to **Prof. Dr., Mohamed Ab ell Slam El-Gendi,** Assistant Professor Anesthesia &Intensive care, Faculty of Medicine, Ain shams University, for his supervision, continuous assistance, valuable support, unfailing interest in the progress of the work, his advice and critical review of the thesis.*

قَالُوا سُبْحَانَكَ لاَ
عِلْمَ لَنَا
إِلاَّ مَا عَلَّمْتَنَا إِنَّكَ
أَنتَ الْعَلِيمُ الْحَكِيمُ

Introduction

Intensive care unit (ICU) clinicians have historically focused on short term outcomes such as successful cardiopulmonary resuscitation, homodynamic stability, and patient survival. During this decade, long –term neurocognitive outcome in ICU survivors have been the subject of extensive investigation. The cognitive dysfunction following critical illness is common, associated with impairment in ability to perform normal everyday activities, decreased quality of life, and may be permanent (***Gunther et al.,*2007).**

The common functional disorders of cognitive and psychological morbidity (delirium, agitation, depression, anxiety, post traumatic stress disorder, and staff stress) have been studied**.** The ICU delirium, the so called ICU-psychosis was considered as a primarily organic brain dysfunction and is not manifestation of psychological distress alone ***(Stuart and John 2008).***

Although the exact mechanisms of ICU delirium are not fully understood, yet the derangements of multiple neurotransmitter systems &inflammatory abnormalities are thought to contribute the development of ICU delirium ***(Girard et al., 2008).***

Agitation is a common event in mixed medical-surgical ICU which is a psychomotor disturbance

characterized by a marked increase in both motor and psychological activities ***(Chevrolet and Jollit, 2006)***.

Depression is a syndrome of distinct and persistent dysphoria associated with neurovegetative perturbation and social and occupational impairment (***Irwin and Rippe's., 2008).***

Anxiety is commonly experienced in critical ill patients who can further contribute to the activation of stress system in an already challenged patient and perhaps cause delay wound healing in surgical patients ***(Rincon et al., 2001).***

The Posttraumatic Stress Disorder (PTSD) is an anxiety disorder where untreated PTSD can result in significant psychosocial deficits for patients, loss of employment, and an economic burden on both patients and their families ***(Wallen et al., 2008).***

Finally, the staff stress is one of emotional toll on physicians and other medical staff in ICU, ranging from anxiety to depression, substance abuse and even suicide ***(Stuart and Jewel, 2006).***

AIM OF THE WORK

The aim of the work is to highlight the most important psychiatric problems in critically ill patients with the most important causes, risk factors, diagnosis, assessment and monitoring in ICU with the most recent methods of management and investigation depending on pathophysiology and pharmacological aspects.

Chapter 1

I-RISK FACTORS and PATHOGENESIS

A-Risk factors and pathogenesis of neuropsychological disorders included:

Patient factors, pathological factors, Environmental factors and iatrogenic factors.

1-Patient Factors

Cognitive dysfunction in later life is a life-span issue and is affected by genetic, developmental, and lifestyle factors, accumulated neural insults, innate and acquired cerebral reserve and compensatory mechanisms, and age-related decline ***(George et al., 2009)***.

A-Age Related Neuropsychological Dysfunctions:

-Delirium:

Delirium is the most common complication of hospital admission for older people. It develops in up to a half of older patients postoperatively; especially after hip fracture and vascular surgery ***(John & Sharon., 2007).***

Pandharipande et al ***(2005)*** reported in medical ICU patients that increasing age and severity of illness scores were significant independent predictors of transitioning to delirium.

- Depression:

Associations between depressive symptoms and brain volumes in geriatric samples may also be confounded by physical symptoms and comorbid medical conditions such as cerebrovascular disease in older adults ***(Dotson et al., 2009).***

In some individuals, vascular disease may contribute to the development of a late life depression syndrome by interrupting the connections between frontal white matter pathways and subcortical structures (such as basal ganglia) involved in mood ***(O'Brien et al., 2006)***.

- Posttrumatic Stress Disorders (PTSDs):

Posttrumatic Stress Disorders *(PTSDs)* may be affecting people at the peak of their productive work years, a situation that may have significant consequences for the persons affected ***(Wallen et al., 2008)***. Other investigators also found that younger age was associated with Posttrumatic Stress Disorders (PTSDs) ***(Cuthbertson et al., 2004)***.

- Dementia and Mood Disorders:

Dementia refers to a disease that causes the deterioration of general memory, speech, executive function, visuospatial function, and other cognitive functions ***(Dugu et al., 2003)***.

Rockwood et al ***(1999)*** studied cognitively intact geriatric medical patients over 3 years and found that patients with delirium had significantly higher dementia incidence than those without delirium.

Depressive disorders in dementia are often somewhat different from those occurring in the absence of dementia. Therefore, overly relying on The Diagnostic and Statistical Manual of Mental Disorders-IV DSM-IV diagnostic criteria may result in an underdiagnosis and undertreatment of depression among dementia patients in ICU. For example, patients with depression and dementia may not endorse hoplesslenss, suicidal thoughts or worthlessness ***(Olin et al., 2002)***.

Anxiety is often the most noticeable symptom, and delusions, typically of a paranoid nature, also accompany depression among dementic patients ***(B. Lee et al., 2008).***

Agitated behaviors such as irritablity, yelling, restlessness, and physical aggression are common in dementia with an estimated prevealence of 20 to 25%of cases ***(Lyketsos et al., 2000).***

Among dementic patients, visual hallucinations are also more common than auditory hallucinations, particularly in dementia of Lewy bodies ***(Weintraub and Hurtig, 2007).***

(B)-Gender and Neuro psychiatric disorders:

1- Delirium:

Many studies suggest that most patients who develop delirium are male (63% male versus 37% female) ***(Aldemir et al., 2001).***

It has also been suggested that males are more likely to abuse alcohol, which in itself has been linked to delirium ***(Lindesay et al., 2002)***.

2- Depression:

The tendency of females to report more depressive symptoms than males might be responsible for their greater likelihood of meeting criteria for a depressive disorder, even though males and females with depressed mood report similar levels of subjective, social and occupational impairment ***(Angst & Dobler-Mikola, 2000).***

3- Posttraumatic Stress Disorder (PTSD):

Generally, experience of traumatic events in women is more strongly associated with the development of psychological problems such as posttraumatic stress than in men ***(Breslau et al., 1999).***

4- Suicide:

In most regions of the world, suicide is more common for males than females in all age Groups. Females, on the other hand, have traditionally favored more passive and less reliable methods such as drug overdoses and drowning ***(Wasserman et al., 2005)***.

(C)-Smoking and Neuropsychiatric disorders

Smokers may have had more signs and symptoms of anxiety if they were experiencing the onset of nicotine withdrawal during the admission to the emergency department and throughout hospitalization. ***(Sharon et al., 2006).***

Hypertension and smoking (presumably due to relative hypoperfusion and nicotine withdrawal, respectively) were significantly associated with the development of ICU delirium ***(Pun& Ely., 2007)***.

Patients smoking more than 10 cigarettes are more vulnerable to chronic pulmonary diseases. Lower oxygen saturation in the brain might influence the onset of delirium in these patients ***(Rompaey et al., 2009).***

Nicotine increases brain serotonin release, and nicotine withdrawal has the opposite effect, leading to the hypothesis that appetite and mood disturbances associated

with nicotine withdrawal may be mediated by diminished serotoninergic transmission ***(Chu et al., 2009)***.

Tobacco smokers are 2 to 5 times more likely to have depressive symptoms than non-smokers ***(Busto et al., 2009).***

In mechanically ventilated patients, sudden nicotine abstinence was associated with severe agitation and its consequences, such as self-removal of tubes and catheters ***(Lucidarme et al., 2010)***.

(D)-Alcohol and Neuropsychological Disorders:

- ***Neuropsychological Effects of Alcohol:***

Alcohol inhibits *N*-methyl-D-aspartate *(NMDA)* neuroreceptor, and chronic alcohol exposure results in up-regulation of these receptors. Abrupt cessation of alcohol exposure results in brain hyperexcitability, because receptors previously inhibited by alcohol are no longer inhibited. Brain hyperexcitability manifests clinically as anxiety, irritability, agitation, and tremors. Severe manifestations include alcohol withdrawal seizures and delirium tremens ***(Bayard et al., 2004).*** .

Chronic alcohol consumption results in upregulation of the GABA-binding sites, implicating a potential role of these changes in alcohol tolerance and withdrawal ***(Cancas et al., 2001)***.

Chronic alcohol use causes atrophy of the frontal lobes and hypometabolism in the frontal cortex. It leads to a pattern of impaired executive functioning related to frontal lobe dysfunction and impaired memory that is detectable by neuropsychological testing ***(Demir et al .,2002)***.

- Delirium Tremens (DTs):

Alcohol withdrawal delirium (AWD), commonly known as delirium tremens or "DTs," is the most serious manifestation of alcohol withdrawal syndrome ***(Mayo-Smith et al., 2004).***

Withdrawal symptoms result from a compensatory increase in the activity of excitatory mechanisms (upregulation) involving the neurotransmitters norepinephrine, dopamine, and the *N*-methyl- D-aspartate (NMDA) receptor, and diminished activity (downregulation) of the inhibitory receptors G-aminobutyric acid (GABA)-A and a2-adrenoceptors, after prolonged depression of the CNS by ethanol ***(Collingridge & Lester., 2003).***

Kainate and quisqualate channels appear to be blocked only by higher alcohol concentrations that clinically produce sedation, stupor and coma in humans, suggesting that inhibition of these receptors is associated with the anesthetic properties of ethanol ***(David .,2000)***.

2-Pathological Factors

Certain pathphysiological factors can affect various neurological and cogenative disorders as cardiovascular, respiratory, traumatic, metabolic, nutritional and oncological factors.

A-Cardiovascular Disorders

Several prospective studies have examined the connection between preservative cognition and cardiovascular health, generally finding evidence of a positive link between them.

1-Coronary Artery Diseases (CAD) And Neurocognitive disorders:

-Depression:

The exact mechanisms interplaying between depression and CAD are still under investigation, however, clinical and interventional studies have shown that the bidirectional relation of the two are connected via adversely affected autonomic and hormonal homeostasis, which result in inflammation, metabolic abnormalities, hypercoagulability, and endothelial dysfunction ***(Lippi et al .,2009)***.

-Anxiety:

The association between phobic anxiety and increased risk from coronary heart disease is not completely explained by established CAD risk factors , and pathways involving behavioral factors, increased sympathetic tone , endothelial dysfunction , dyslipidemia , and increased inflammatory biomarkers have been proposed ***(Brennan et al .,2009).***

2- Heart Failure (HF) and Neurocognitive Disorders:

Persons with cardiac failure often have multiple vascular risk factors and may have multiple medical co-morbidities, including ischemic heart disease, hypertension, diabetes, renal disease, hepatic dysfunction, atrial fibrillation and sleep apnea. Many of these are established risk factors for cognitive impairment ***(Knopman et al., 2001)***.

Its suggesting that cognitive impairment associated with cerebral hypoperfusion is reversible and is therefore unlikely to be associated with any significant permanent structural cerebral injury ***(Pullicino et al .,2008).***

3-Rumination Associated Cardiovascular Disorders:

Rumination is the tendency to think repetitively and passively, often about situations that caused negative