INTERNATIONAL JOURNAL OF RESEARCH SCIENCE & MANAGEMENT

PROFILE OF DECREASED CONSCIOUSNESS IN GERIATRIC PATIENTS AT H. ADAM MALIK HOSPITAL MEDAN IN 2018

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DOI: https://doi.org/10.29121/ijrsm.v7.i9.2020.3
Keywords: Consciousness, Geriatrics, Hyponatremia, Hypokalemia.

Abstract
Introduction: The decline in consciousness, disruption of either the level or content of consciousness, is a significant problem in the ER (Emergency Room). The incidence varies from 4% to 10%. It is an emergency medical condition that requires proper evaluation and initial management in the ER. Fluid and electrolyte imbalance disorders leading to loss of consciousness among hospitalized geriatric patients and the infection and effects of the drug. Delirium is closely related to dehydration, a multifactorial problem associated with some physiological changes in old age.
Aim: This research aims to know about the decline profile of consciousness in geriatric patients in RSUP H. Adam Malik Medan in the year 2018.
Methods: This descriptive-analytic study used retrospective design by collecting the medical record data of the patients who had been consul to the geriatric division in 2018. There are 1391 research subjects taken in total sampling. Data analysis is presented in the form of the frequency distribution of respondents characteristics including age, gender, primary diagnosis of loss of consciousness, electrolyte examination, and head of CT-scans and analysis by using the Kruskall-Wallis test to determine the relationship age with the incidence of loss of consciousness due to electrolyte imbalance. Data analysis using SPSS 20th.
Result: Obtained by the most five diseases that cause a loss of consciousness in geriatric patients, i.e., electrolyte imbalance (imbalance) 876 people (63.0%), ischemic stroke 155 people (11.1%), sepsis as many as 141 (10.1%), hemorrhagic stroke 89 people (6.4%), and hypoglycemia 69 (5.0%). Geriatric patients with electrolytes imbalance due to hyponatremia (89.3%) and hypokalemia(28.53%). There is no association between the age and the electrolyte levels of geriatric patients, $p>0.05$.
Conclusion: Decreased consciousness in geriatric patients is most due to electrolyte imbalance.

Introduction
Consciousness describes as a state of self-consciousness and environmentally and consists of two components; level and content of consciousness. The level of consciousness refers to the level of mental alertness, while the content of consciousness refers to the orientation of self-perception and environment, including cognition. The decline in consciousness, disruption of either the level or content of consciousness, is a significant problem in the ER. The incidence varies from 4% to 10%. It is an emergency medical condition that requires proper evaluation and initial management in the ER. Intracranial or extracranial disorders can cause decreased consciousness. Choosing the most appropriate and direct investigation for the etiological diagnosis is a major clinical challenge due to limited clinical information and no more time spent in the ER practice.[1]

Fluid and electrolyte imbalance leading cause of loss of consciousness among hospitalized geriatric patients and the infection and effects of the drug. Delirium is closely related to dehydration, a multifactorial problem associated with some physiological changes in old age. Such changes can also cause hyponatremic dehydration, which is not uncommon in older people.[2]

Method
This descriptive research uses a retrospective design by collecting the medical records of the patients that are consular to the Geriatric Division at RSUP Haji Adam Malik in 2018. There are 1391 research subjects taken in total sampling. Data analysis is presented with the frequency distribution table of respondents characteristics, including age, gender, primary diagnosis of loss of consciousness, electrolyte examination, and head CT-scans and analysis data by using the Kruskall-Wallis test to determine the relationship between age and incidence of loss of consciousness due to electrolyte imbalance. The data were processed using SPSS 20th.

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Result

The Characteristics of Research Subject

Table 1. The characteristics respondent

Variable	n=1391	%
Sex		
Male	657	47,2
Female	734	52,8
Age, Median(Min-Max)	66 (56 -95)	
Diagnosis		
Hyperglycemia	2	0,1
Cardiogenic Shock	5	0,4
Chronic Kidney Disease	25	1,8
Ischemic Stroke	155	11,1
Hemorrhagic Stroke	89	6,4
Encephalopathy	7	0,5
Electrolyte imbalance	876	63,0
Hypoglycemia	69	5,0
Brain Metastasis	19	1,4
Brain Tumor	3	0,2
Sepsis	141	10,1
Laboratory Result, Median(Min-Max)		
Hemoglobin	10,80 (3,10 -95,0)	
Leukocytes	11.730 (23 – 120.230)	
Thrombocytes	251.000 (4.000-929.000)	
Neutrophils	81,0 (2,0-98,7)	
Lymphocytes	9,55 (0,00-89,90)	
Blood glucose	119 (13-1134)	
Sodium	129 (13,1-171)	
Potassium	3,6 (1,09-8,6)	
Chloride	98 (9,6-977)	
Albumin	2,3 (1,00-12,8)	
Head CT-scan		
Infarction	236	17,0
Atrophy	44	3,2
SOL	175	12,6
Normal scan	66	4,7
Another	870	62,5

Note : SOL: Space Occupying Lesion

The characteristics of respondents display in Table 1. Most of the research subjects were male (52.8%), and females (47.2%) with a median age were 66 years. Based on the disease diagnosis, five diseases cause decreased consciousness in geriatric patients, i.e., electrolyte imbalance (63%), ischemic stroke (11.1%), sepsis (10.1%)), hemorrhagic stroke (6.4%), and hypoglycemia(5.0%). Based on the results of routine blood laboratory test and supporting Head of Ct-Scan obtained median hemoglobin 10.0 g/dl, leukocytes 11,730 cells/mm3, platelets 251,000 cells/mm3, neutrophil (81.0%), lymphocytes (9.55%), blood glucose 119 g/dl, a median electrolyte test of sodium 129 mEq/ml, potassium 3, 6 mEq/ml, and chloride 98 mEq/ml, albumin 2.3 g/dl. The results of the Head Ct scan was infarction (17.0%), SOL (Space Occupying Lesion) (12.6%), the normal scan (4.7%), and atrophy (3.2%), and 870 people (62.5%) did not undergo the examination.

Profile of Electrolyte Levels in Electrolyte Imbalance Patients

The most common cause for decrease of consciousness in geriatric patients is an electrolyte imbalance, from 876 geriatric patients with an imbalance was hyponatremia (89.3%) (Table 2. Fig. 1) and hypokalemia (28.53%) (Table 3, Fig. 2).

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Table 2. The characteristics respondent

	Natrium Level	n
Electrolyte Imbalance	Hyponatremia	783 (89,3%)
	Normal	92 (10,5%)
	Hypernatremia	1 (0,11%)
	Total	876

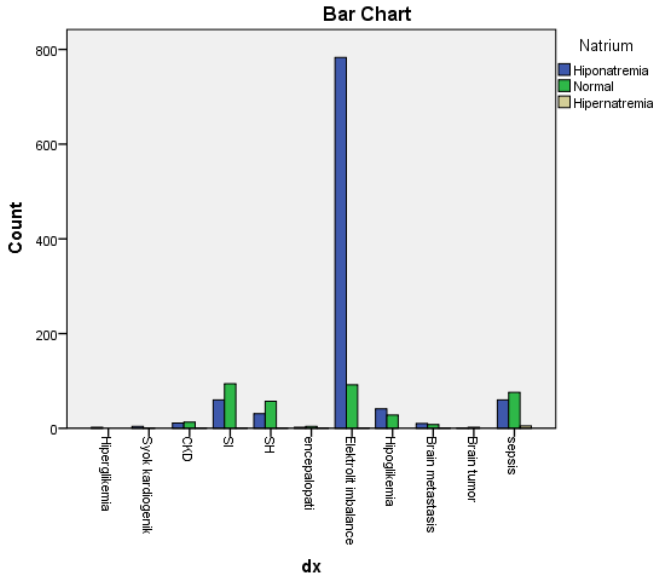

Figure 1. Distribution of diseases underlying decreased consciousness in geriatric patients based on sodium levels.

Table 3. The characteristics respondent

	Potassium Level	n
Electrolyte Imbalance	Hypokalemia	250 (28,53%)
	Normal	552 (63,01%)
	Hyperkalemi	74 (8,44%)
	Total	876

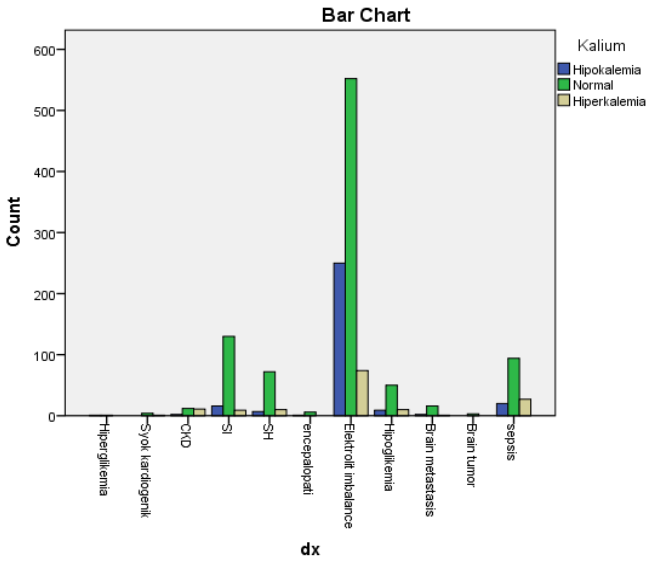

Figure 2. Distribution of diseases underlying decreased consciousness in geriatric patients based on potassium levels.

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The Association Between Age and Electrolyte Levels in Geriatric Patients

This study also wanted to determine the relationship between age and electrolyte levels in geriatric patients. Based on the analysis of the age Kruskall-Wallis test on natrium and kalium levels, there was no significant age difference in electrolyte levels (p> 0.05) with p-values for sodium $p = 0.199$ (Table 4, Fig. 3) and potassium respectively $p = 0.147$ (Table 5, fig. 4).

Table 4. The association between age and sodium levels

	Natrium Level	Median (Min-Max)	*p**
Age	Hyponatremi	66 (56-95)	0,199
	Normal	67 (60-93)	
	Total	1391	

Note : **p* >0,05

Table 5. The association between age and potassium levels

	Kalium Level	Median (Min-Max)	*p**
Age	Hypokalemi	66 (60-90)	0,147
	Normal	67 (56-93)	
	Total	1391	

Note : **p* >0,05

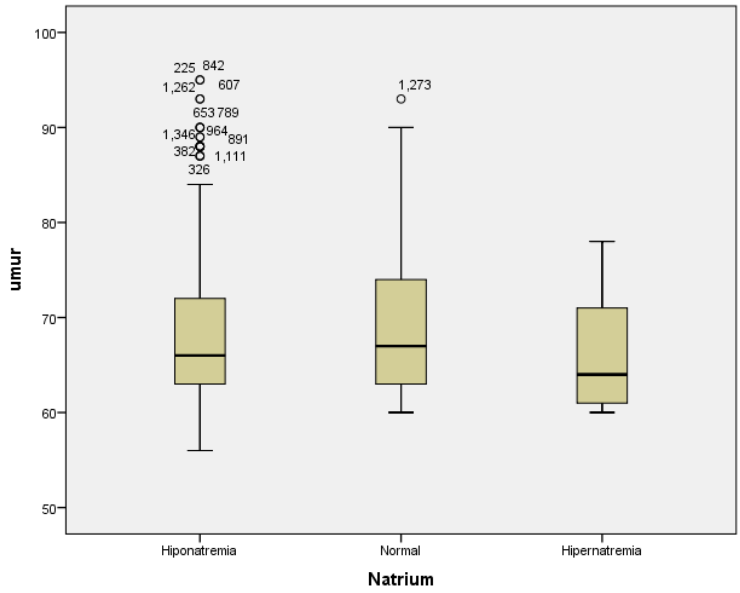

Table 3. Age distribution related to natrium levels

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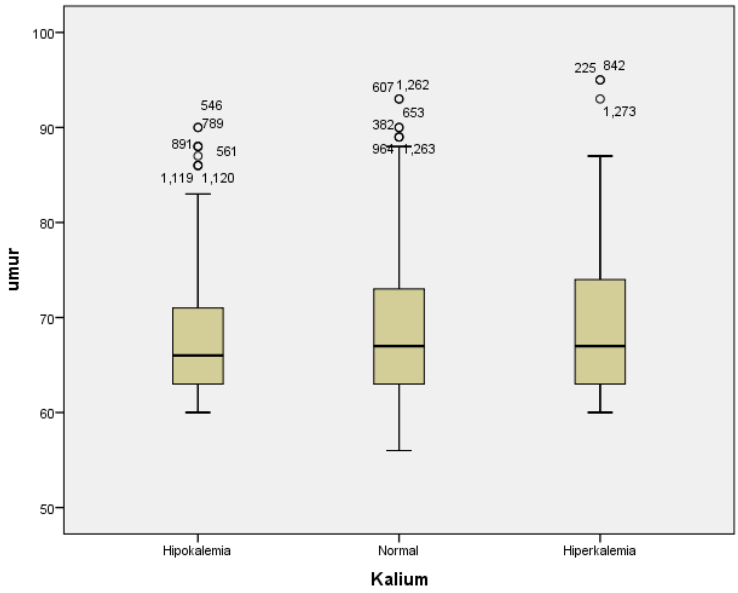

Figure 4. Age distribution related to kalium levels

Discussion

Hyponatremia is the most common cause of electrolyte disorder in patients hospitalized and in public subjects. Elderly patients represent a high-risk group for hyponatremia because age is a strong independent risk factor for hyponatremia. Besides, symptoms of acute hyponatremia (develops in the < 48 hours) such as nausea, vomiting, headache, fainting, coma, and convulsions, as well as manifestations (even mild) associated with chronic hyponatremia, such as fatigue, cognitive impairment, deficit-style running, falling, adverse effects on bone quality (e.g., osteoporosis) and fractures, more frequent and severe in elderly patients. The relevant study also showed that hyponatremia relates to a poor prognosis in the elderly subject, as it is independently associated with an increased risk of death.[3]

Hyponatremia is associated with poor clinical outcomes, including increased mortality and a prolonged increase in hospitalized. Hyponatremia occurs due to the disruption of sodium and water homeostasis, usually maintained by complex multi-system physiological mechanisms. Those represent excess water relative to sodium, although the total sodium and body water can increase, normal, or decreased. Consequently, there are many potential causes of the underlying hyponatremia, covering a wide range of diseases, pharmacotherapy, and pathophysiological variants, each with different treatment requirements.[4]

In this study, most geriatric patients who were consular because of decreased consciousness were the result of electrolyte disorders (63%). This condition occurs because the elderly electrolyte disorders encounter, either physiological or pathological. In general, there is a decline in homeostatic. In particular, decreased thirst response to hypovolemic conditions and hyperosmolarity was reduced. Besides, there is also a decrease in the ability of glomerulus filtration rate, renal concentration function, renin, aldosterone, and decreased renal function response to vasopressin, elevated levels of atrial natriuretic peptide (ANP) will cause suppress the secretion of renal renin, plasma renin activity, and plasma angiotensin.[5]

Most of the electrolyte disturbances related to hyponatremia (89.3%) with contributing factors leading to hyponatremia in the elderly include age-related decreased GFR and free water clearance and sodium loss from reduced activity of the renin-angiotensin-aldosterone system and increased activity of natriuretic hormones. However, the latter may reflect the early development of fluid retention, such as that may occur with excessive sodium intake from processed foods or subclinical heart disease and increased vasopressin activity in some elderly patients.[6] Another study by Kirstenet et al[7], also reported hyponatremia in elderly patients with fractures. Miller M[8] reported hyponatremia at (11%) of the outpatient geriatric population. In contrast, Snyder et al.[9] was found hypernatremia (1%) of the elderly hospitalized population.

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The geriatric patients suffered hypokalemia (28.53%). Total body potassium in the elderly is reduced compared to young people (about 2500 vs. 3000 mmol). Skeletal muscles contain as much as 75% of body potassium; Therefore, the loss of muscle mass with age may decrease the total amount of body potassium. Besides, an increase in comorbidity and frequent use of drugs that can cause hypokalemia may also contribute to an increased risk of hypokalemia in the elderly. Hypokalemia develops in the hospital, prolongs the stay and leads to increased mortality.[10]

The severity of the clinical manifestation of hypokalemia tends to be comparable to the rate and duration of reduction in serum potassium. The general symptoms do not appear until serum potassium below 3.0 mEq/L, except when rapidly dropping or the patient has a potentiating factor, such as the ingestion of digitalis drug-related with tendency arrhythmia. According to the severity of hypokalemia, symptoms can vary from none to a deadly heart arrhythmia. Symptoms usually heal with the correction of hypokalemia.[11]

This research analysis assesses the relationship between the age and electrolyte levels in the form of sodium and potassium. There is no relationship between the age of either sodium and the level of potassium. This insignificant outcome may be due to the accompanying subject only derived from geriatric groups, with the median age between each group (Hyponatremi group or hypokalemia with a normal group), which only has a 1-year difference. The addition of subjects with a broader age group other than elderly age may be considered as a control in subsequent studies.

Conclusion

Loss of consciousness in geriatric patients is most due to electrolyte imbalance such as hyponatremia (89.3%) and hypokalemia(28.53%). There is no association between the age and the electrolyte levels of geriatric patients, $p>0.05$.

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