

Sleep Quality Relation with Hemodynamic Status on AMI Patients in ICVCU Room

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Keywords: Acute Myocardial Infarction (AMI), Sleep Quality, Hemodynamic, MAP, Pulse, Respiration.

Abstract: Acute Myocardial Infarction (AMI) causes clinical symptoms that are felt by the patient, some of them are shortness of breath, pale, headache, nausea, vomiting and the most common are chest pain. The presence of such sleep disorders may affect the patient's hemodynamics. This study was conducted with the aim of knowing whether there is a relationship between the quality of sleep with hemodynamics in AMI patients. The research used descriptive analytic research design with cross-sectional approach. The sample used as many as 30 respondents, sleep quality assessment using questionnaire and hemodynamic assessment done by observation. The correlation test that used is Spearman test. The results of this study found sleep quality with light sleep disorder 43.3%, medium 50%, weight 6.7%. The result of statistic analytic with Spearman test showed relationship of sleep quality with MAP with p-value 0,003, sleep quality relationship with pulse significance(p-value) 0.0001, and relation of sleep quality with respiration significance (p-value) 0.0001. From the value of significance between sleep quality variables and hemodynamic variables showed that there was a correlation between sleep quality and hemodynamic status (MAP, pulse and respiration) in AMI patients. The conclusion is that there is a correlation between the quality of sleep with hemodynamic status (MAP, pulse, respiration) in AMI patients in ICVCU RSUD Dr.Moewardi.

1 BACKGROUND

Acute Myocardial Infarction causes clinical symptoms that the patient feels, some of them are dyspnea (shortness of breath), orthopnea, pale, cold sweat, headache, nausea vomiting. Clinical symptoms in such AMI patients will leave nursing problem and disturbing basic human needs, such as chest pain at rest, and sleep disturbances that can affect the patient's hemodynamic (Smeltzer, 2002).

In addition to hemodynamic changes, AMI patients may have other symptoms; weakness, burnout, irregular exercise schedule, dyspnea at rest or work (Carpenito, 2000). AMI patients will generally experience a decrease in sleep quality and cardiovascular status. Poor sleep quality may result in improved patient condition, which will extend hospital stay (Nurarif 2013). The system of activity or sleeping habits of nowadays is largely ignored by society. Like people with heart disease if the sufferer lack of sleep time resulted in the heart will work harder. Sleep disorders characterized by increased incidence of chest pain, increased heart rate, electrocardiogram changes, high blood pressure and

risk of heart disease and stroke (Potter, 2010). The hemodynamic conditions of patients with myocardial infarction vary as cardiac output may be reduced slightly or maintained within normal limits, increased heart frequency is usually not continuous unless there is myocardial depression, blood pressure is a function of interaction between myocardial depression and autonomic reflex (Muttaqin, 2009).

AMI patients experience hemodynamic changes requiring intensive care in hospitals. RSUD Dr.Moewardi Surakarta has a special room to handle heart disease problem that is Intensive Cardio Vascular Unit (ICVCU) room. ICVCU is a special care unit for treating life-threatening cardiovascular system patients with trained personnel and supported with the completeness of specialized equipment Based on a preliminary study conducted by researchers at RSUD Dr.Moewardi Surakarta obtained prevalence data of AMI patients in ICVCU Room in 2010-2011 as many as 183 patients, in 2012 as many as 175 patients, while the year 2013-2014 increased to 825 patients. From 28 November 2015 to 9 December 2015 there are 20 cases of patients with AMI (Medical Record, 2015). From the results of

interviews with 20 patients data obtained patients complained of chest pain and there is sleep disturbance. 25% of patients awoken from sleep during the night due to cold, pain and not feel comfortable during sleep. And 25% of other patients say they can not sleep because they feel pain. Patients with AMI who experience sleep disturbances usually experience hemodynamic changes characterized by blood pressure may be normal or ups and down, pulse can be normal or up and down, increased respiratory frequency, shortness of breath, pale and even cyanosis (Doengoes, 2000).

The general objective of this study was to prove the relationship between sleep quality and hemodynamic status in AMI patients in the ICVCU RSUD Dr.Moewardi.

2 METHODS

The type of this research is non-experimental research with analytical descriptive and cross-sectional approach. Data collection in this study was conducted by providing questionnaires, observation and documentation study that aims to analyze the independent variables and dependent variables. Implementation of sampling technique in this study using nonprobability sampling method by total sampling of 30 respondents. By using Spearman correlation test.

3 RESULTS

3.1 Characteristics of Respondents by Age

Table 1: Age-Based Frequency Distribution.

Age	Amount	Percentage(%)
< 40 years	1	3.3
40-60 years	20	66.7
>60 years	9	30.0
Total	30	100

3.2 Characteristics of Respondents by Sex

Table 2: Frequency Distributions by Sex.

Gender	Amount	Percentage (%)
Male	20	66.7
Female	10	33.3
Total	30	100

3.3 Distribution of Frequency based on Sleep Quality

Table 3: Frequency Distribution Based on Sleep Quality.

Sleep Quality	Amount	Percentage(%)
no sleep disturbance	0	0
light sleep disorder	13	43.3
medium sleep disorder	15	50.0
severe sleep disorder	2	6.7
Total	30	100

3.4 Spearman Test between Sleep Quality and MAP

Table 4: Spearman test between sleep quality and MAP.

N	R	p-value	Evidence
30	0.517	0.003	There is a relation

3.5 Spearman Test between Sleep Quality and Pulse

Table 5: Spearman test between sleep quality and pulse.

n	r	p-value	Evidence
30	0.660	0.0001	There is a relation

3.6 Spearman Test between Sleep Quality with Respiration

Table 6: Spearman test between sleep quality and Respiration.

N	R	p-value	Evidence
30	0.760	0.0001	There is a relation

4 DISCUSSION

The most aged AMI respondents among 40-60 years was 66.7%. So from the results of the study concluded that AMI sufferers more attack at the age of 40-60 years. This is consistent with the theory of Corwin (2009) which states that 45% AMI occurs at age >40 years and above are likely influenced by several factors such as stress, obesity, hypertension which causes increased afterload which will directly increase the workload of the heart so that trigger

ventricular hypertrophy left which results in an imbalance between the need and supply of oxygen.

AMI patients who experience acute pain are caused by hypoxia in the heart muscle tissue that forces cells to perform anaerobic metabolism, resulting in lactic acid and also stimulate the release of other iritatif substances such as histamine, quinine or cellular proteolytic enzymes that stimulate the ends of muscle pain receptors heart and impulse pain are transmitted through afferent nerve fibers and are precipitated by pain due to excessive sympathetic nervous stimulation will lead to increased cardiac work by stimulating the SA node resulting in more than normal or fast heart beat frequency (Corwin, 2009).

The majority of AMI patients were male. Men are more likely to have bad habits or lifestyles that can affect the health such as smoking and drinking alcohol that can affect a person's health.

In a person who smokes, cigarette smoke will damage the walls of blood vessels. Cigarettes contain many thousands of chemicals that are harmful to the health of the body that can cause the heart will pump even stronger and cause increased blood pressure.

Factors that affect the heart rate are physical exercise, temperature, emotion medicine, posture changes and pulmonary disorders. In addition to these factors from the study also showed that the quality of sleep also affects the heart rate. This is because a person who is lack of sleep will increase RAS (Reticular Activating System), when RAS increases one's emotions also increases finally hormone stimulates heart and heart contractions eventually work faster and lead to increased pulse (Potter, 2010).

Respiration of respondents $>20x/min$ is caused by the increasing of body oxygen requirement, while body oxygen is not increased so that it will cause the increase of oxygen requirement to fulfill the requirement of body metabolism so that there will be increasing of breathing frequency along with the increase of pulse frequency (Potter, 2010).

In patients with heart disease such as AMI patients usually feel the pain especially the patient with the first attack, other than that usually patients feel shortness of breath because the circulation of oxygen in the blood is reduced. Lack of oxygen supply which can cause tissue hypoxia and cause shortness of breath. Shortness of breath in AMI patients will usually cause sleep disorders.

MAP is the mean arterial pressure during one heart cycle is affected by cardiac output (CO), tone, arterial elasticity and peripheral resistance, blood viscosity and blood pressure preservation mechanism (Smeltzer, 2002).

The adequate of blood pressure in each individual should always be assessed. Increased or decreased blood pressure is strongly influenced by the sensory nerve where the nerve can affect vasomotor activity, especially related to pain. Light pain can increase vasomotor activity resulting in an increase in blood pressure, while severe pain can decrease vasomotor activity and cause a decrease in blood pressure (Jevon, 2009).

5 CONCLUSIONS

Most of IMA patients with age between 40-60 years. Respondents of male sex more than women. Most have medium sleep disorder and light sleep disorder. There is a relationship between sleep quality and MAP. There is a relationship between sleep quality and pulse. There is a relationship between sleep quality and respiration

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