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Original Article : Community Research

SOCIAL-FAIRNESS PERCEPTION IN NATURAL DISASTER, LEARN FROM LOMBOK: A PHENOMENOLOGICAL REPORT

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ABSTRACT

Introduction: Disasters occur in all areas of the world and cause harm to populations, property, infrastructure, economies, and the environment.[1]Harm to populations includes death, injury, disease, malnutrition, and psychological stress.[1]Social-friction often isn't recognized during disaster response and recovery. **Objective:** This report explored the existence of social-friction in disaster situation which able to make recovery more complex. **Method:** This was qualitative study with phenomenology report approach. The data collection was done by indepth interviewing five inhabitants when doing emergency disaster response two weeks after massive earthquake in North Lombok. **Result and discussion:** Two out of five inhabitants were Lombok native-people, the rest were immigrant. An inhabitant reported their feeling treated unfair by aid agencies because they received less aid than others. In another chance, when distributing clean-water, we were intercepted, they argue that they got more lack of water than another group who live far distally. Both claimed treated unfair making a dispute friction.Ethnic or social origin, language, religion, gender, age, physical or mental disability, and sexual orientation are just some of the deep-rooted causes of social-friction that can have such a devastating impact on their lives.Social-friction in everyday life rarely endangers lives, but in an emergency situation, it can be life-threatening. It affects not only people's ability to survive the crisis, also their capacity to recover and regain their livelihoods. **Conclusion:** Risk reduction and preparedness are just as important a part of the process as any aspect of a disaster.Dialogue is fundamental in good programme design, monitoring and evaluation, and systematic efforts to listen to all groups affected by disaster can help pre-empt and remedy unfair-perception.Perhaps,most importantly, understanding and respecting the complex cultural context in which aid agencies are working and using the strategies and mechanismsto detectand minimize social-friction, will result great improvement in the effectiveness and equity of perceived support in humanitarian assistance.

Keywords: Disaster, Perceived Support, Psychological Trauma, Social-Friction.

ABSTRAK

Pendahuluan: Bencana dapat terjadi dimana saja dan menyebabkan kerusakan pada populasi, properti, infrastruktur, ekonomi, dan lingkungan.[1] Bahaya terhadap populasi meliputi kematian, cedera, penyakit, malnutrisi, dan stres psikologis.[1] Gesekan sosial seringkali tidak dikenali selama respons dan pemulihan bencana. **Tujuan:** Laporan ini mengeksplorasi adanya gesekan sosial dalam situasi bencana yang dapat mengakibatkan pemulihan menjadi lebih kompleks. **Metode:** Studi ini merupakan penelitian kualitatif dengan pendekatan laporan fenomenologi. Pengumpulan data dilakukan dengan melakukan indepth interview pada lima penduduk ketika melakukan tanggap darurat bencana dua minggu setelah gempa bumi dahsyat di Kabupaten Lombok Utara. **Hasil dan diskusi:** Dua dari lima penduduk adalah penduduk asli Lombok, sisanya adalah etnis pendatang. Salah seorang penduduk melaporkan perasaan mereka yang diperlakukan tidak adil oleh lembaga pemberi bantuan karena menerima bantuan lebih sedikit dari kelompok penduduk lainnya. Dalam kesempatan lain, ketika mendistribusikan air bersih, kami dihalangi oleh sekelompok orang, mereka berpendapat bahwa mereka mendapatkan lebih sedikit air daripada kelompok lain yang tinggal lebih jauh. Saling merasa diperlakukan tidak adil membuat terjadinya perselisihan. Asal-usul etnis atau sosial, bahasa, agama, jenis kelamin, usia, kecacatan fisik atau mental, dan orientasi seksual adalah beberapa penyebabgesekan sosial yang dapat memberikan dampak buruk pada kehidupan mereka. Gesekan sosial dalam kehidupan sehari-hari mungkin jarang membahayakan nyawa, tetapi dalam situasi darurat, itu bisa mengancam nyawa. Hal tersebut tidak hanya memengaruhi kemampuan orang untuk selamat dari krisis, juga

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kapasitas mereka untuk pulih dan mendapatkan kembali kehidupan mereka. **Kesimpulan:** Pengendalian risiko dan kesiapsiagaan adalah bagian penting dari setiap aspek bencana. Dialog merupakan hal mendasar dalam perancangan program, pemantauan dan evaluasi, dan upaya sistematis untuk mendengarkan semua kelompok korban bencana yang dapat membantu mencegah dan memperbaiki persepsi ketidakadilan. Terlebih yang lebih penting, memahami dan menghormati budaya yang kompleks di mana lembaga pemberi bantuan bekerja serta menggunakan strategi dan mekanisme untuk mendeteksi dan meminimalkan gesekan sosial, akan menghasilkan kemajuan besar dalam efektivitas dan kesetaraan perceived support dalam bantuan kemanusiaan.

Kata kunci: Bencana, Perceived Support¸ Trauma Psikologis, Gesekan Sosial.

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INTRODUCTION

Disaster is a sudden, calamitous event that seriously disrupts the function of a community or society and causes human, material, and economic or environmental losses that exceed the society's ability to cope using its own resources. Disaster occurs when a hazard impacts on vulnerable people. Though often caused by nature, disaster can have human origins. Natural hazards are naturally occurring physical phenomena caused either by rapid or slow onset events which can be geophysical (earthquakes, landslides, tsunamis and volcanic activity), hydrological (avalanches and floods), climatological (extreme temperatures, drought and wildfires), meteorological (cyclones and storms/wave surges) or biological (disease epidemics and insect/animal plagues).[3]

Indonesia is a high risk country for disaster. In the World Risk Index (WRI) 2016 Report, Indonesia is categorized as high risk (WRI 10.24%) with exposure to natural disasters of 19.36% (very high) and vulnerability of 52.87% (high).[4]

In 2018 there were various disasters in Indonesia, one of which was an earthquake on the Lombok Island, West Nusa Tenggara with 564 people dead, approximately 1600 people were injured, and 445 thousand people were evacuated.[5]

Disaster causes harm to populations, property, infrastructure, economies, and the environment. Harm to populations includes death, injury, disease, malnutrition, and psychological stress.[1]

Exposure to disaster is a trigger for [psychological] trauma and other pathological stress.[6] Studies on post-disaster traumatization processes are still limited. But many researchers have tried to assume the relationship between disaster exposure and the psychological impact of the victim.As early as the 1960s, the disaster sociologist Fritz (1961), suggested a much more positive framework approach to understand psychosocial disaster response patterns.[6]

According to this approach, negative psychological impact on disaster survivors is reduced by their social experience of "therapeutic adjustment". The widespread sharing of danger, loss, and deprivation produces an intimate, primary group solidarity among the survivors, which overcomes social isolation and provides a channel for intimate communication and expression and a major source of physical and emotional support and reassurance (therapeutic community). Other researchers in this tradition have found solidarity to be an universally shared response to crisis, characterized by a reduction in status differences and increased generosity and helpfulness, also the formation of new cross-cultural community. The existence of conflict

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in disaster conditions was still considered a "disaster myth" in early sociological studies.[6]

More recent studies provide a new concept, that developed a time-dependent relationship between solidarity and conflict. The temporary peace will tip over into a social conflict at the latest with the advent of external aid. Scarcity of basic resourcesof life, pre-disaster social vulnerability, and perceptions of unfairness increase the egostic attitude of individuals or groups that potentially cause post-disaster friction or conflict.[6,7]

This phenomenology study aimed to show that the social-unfairness perception is potentially able to cause social conflict or friction after natural disaster which was often seen as a disaster myth in some previous views. Through this report, government and aid-agencies involved in disasters are expected not only to pay attention to post-disaster recovery but also to prevent post-disaster conflicts which can further hamper the process of disaster management and recovery.

METHOD

This was a qualitative study with phenomenological report design. There were five participants in this study who were selected using convenience sampling method based on participant accessibility to the researcher. This study was conducted on August 19th – 23rd, 2018 in Bayan Village, Kayangan Sub-District, North Lombok Regency, and the author was a medical volunteer from Surabaya office of Indonesian Red Cross (IRC) disaster response team. The author conducted an interview with unsystematic interview technique to the participants while finding verbal friction among participants during aids distribution.

Phenomenology is a qualitative research method that is widely accepted for describing human beings experience a certain phenomenon. Phenomenology can be defined as the direct investigation and description of phenomena as consciously experienced by people living those experiences (lived spaced, lived body, lived time, and live human relation). It allows the researcher to delve into the perceptions, perspectives, understandings, and feelings of those people who have actually experienced or lived the phenomenon or situation of interest. A phenomenological study attempts to set aside biases and preconceived assumptions about human experiences, feelings, and responses to a particular situation. Phenomenological research is typically conducted through the use of in-depth interviews of small samples of participants (often 5 – 10 participants). By studying the perspectives of multiple participants, a researcher can begin to make generalizations regarding what it is like to experience a certain phenomenon from the perspective of those that have lived the experience.[8]

RESULT AND DISCUSSION

There are five participants in this study, including three women and two men with an average age of 59.4 years. Three out of five are immigrants who have inhabited in North Lombok, while the remaining two are Lombok native people. The native inhabitants of Lombok constitute 85% of the population of Lombok Island, while the rest are immigrant communities (10% Bali, 5% consist of Java, Sumbawa, Chinese and Arabic). Based on the author's observations, most of the immigrant population lives in more remote places from the center of community activities.

Those five inhabitants were massive earthquake victims in Lombok in July - August 2018 who settled in Bayan Village, Kayangan District, North Lombok Regency. There was no

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core family of the participants who died in that earthquake

There was verbal friction between groups within the same village when the aids distribution process, such as health services, clean water, tents, and bedding. Friction occured because of the feeling not being treated equally and mutual claim of unequal distribution processes.

Participant 4 came to IRC post and enter a complaint that his residential area had not received health services like other areas. When distributing health service and clean water to the area, there were several residents who blocked the distribution process, participant 4 wanted the aids to be distributed at the place where they stopped the aid trucks because they felt that the aids received was insufficient for the residents. Participant 2, participant 3, and participant 5 from another group asked for distributing distally (more remote) because their territory received feweraids.

In the interview, participant 1 (male, 54 years old) said,

"Many organizations came to give assistance, but our area isn't noticed. We have not received aid-distribution for a week. Even though the deeper (farther / more remote) ones get help."

Participant 2 (female, 50 years old) said,

"We often aren't noticed. Many goods are dropped at the tip of the road and not distributed to us by village officials"

Participants 3 (female, 65 years) and 5 (female, 68 years) said,

"Here water pipes are built, water come from [Mount] Rinjani, but we who live closer to Rinjani aren't drained of water."

Participant 4 (male, 60 years) said,

"The truck and water tank must stop here, because in farther community have already received water yesterday. We need more here."

Each group felt treated unfair for the treatment of disaster victims.

Disaster occurs when the risk exceeds the ability of the community to overcome them.Disasters occur when danger comes to vulnerable communities.

$$Risk = \frac{hazard \times vulnerability}{capacity}$$

Vulnerability depends on several factors, including physical, social, economic and environmental factors.Social factors depend on the level of education, security, community peace, access to basic human rights, good governance systems, social equality, and positive cultural values.

The occurrence of natural disasters causes not only physical and biological damage, but also disruption of social equilibrium.In the previous theory, it was stated that the occurrence of natural disasters formed a society's altruistic attitude so that it could reduce even eliminate the friction that previously existed. Solidarity is a sharing response that is common in post-disaster crisis, which is characterized by reduction in status differences, increased generosity, helpfulness, and the formation of new cross-cultural communities. The social dynamics proposed in that theory make post-disaster conflicts or friction considered a disaster myth.

However, Oliver-Smith in 1979 offered a more nuanced perspective, namely time-dependent relationships between solidarity and conflict.[9] In his initial study in the Peru Earthquake (1979), there is the shifting forms of social identification within post-disaster processes. In the rescue situation immediately

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after the earthquake, when flight wasa question of death or survival, the primary social focus was on rescuing oneselfand one's family. Only in the subsequent early post-impact period did community solidarity and cooperation prevail and status differences among survivors appearto be suspended.

However, this "brotherhood of pain" did not last long—it tipped over into conflict, at the latest with the advent of external aid.[9] Conflict is often coupled with external aid and the sudden availability of material resources that need to be distributed.[6] Scarcity of basic resources of life, pre-disaster social vulnerability, and unfairness perceptions increase the egostic attitude of individuals or some groups that tend to post-disaster friction or conflict.

In the Social Support Deterioration Deterrence Model (Figure 1), it is hypothesized that the perceived support, not the received support, affects the pattern of society facing stressors.[10] Society subjective perception on fairness is the major cause of post-disaster conflict. While the amount of aid received (received support) does not have a direct relationship to distress.[10]

This was reflected in the cases that occurred in this report. The perspective of fairness between the aid provider and the recipient were very likely to be different. Participant 4 proactively requested aids distribution because it did not meet the needs of his group. While participant 2, 3, and 5 saw subjectively that the aids much more distributed to other groups. This perception of unfairness which is the part of perceived support can potentially produce friction, especially if there has been social vulnerability before the disaster.

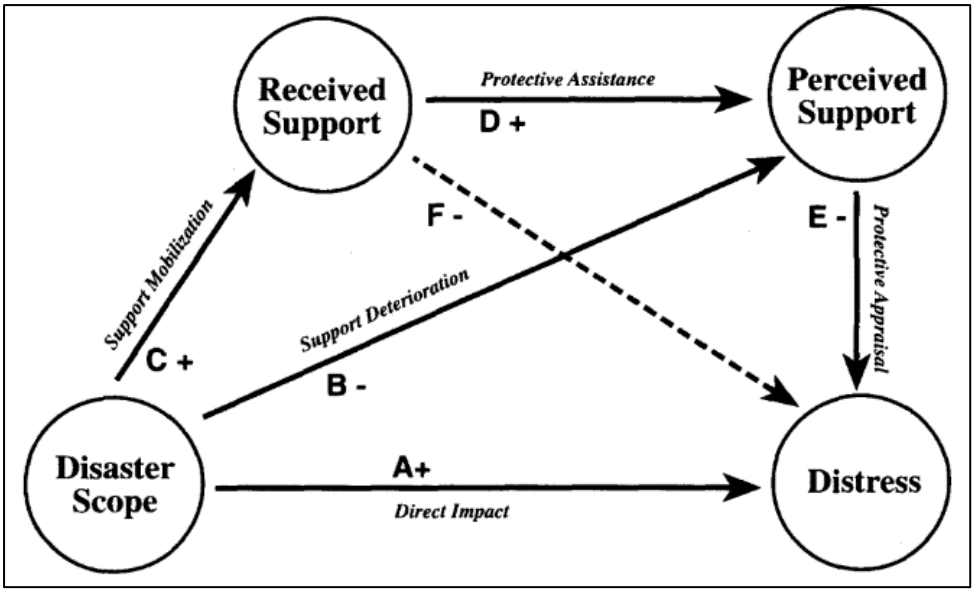

Figure 1. Social Support Deterioration Deterrence Model[10]

Post-disaster social bitterness, as a secondary psychological trauma, may emerge due to dissatisfaction with aid, social support, interpersonal constraints, and conflicts, leading to increased distress.[6] Besides, the existence of previous friction or conflictcan be strengthened or become a new conflict after a disaster. Ethnic or social origin, language, religion, gender, age, physical or mental disability, and sexual orientation are just some of the deep-rooted causes of social-friction that previously exist.[2] Post-disaster conflict if isn't handled properly,

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will have a huge impact. Social-friction in everyday life rarely endangers lives, but in crisis and emergency situation, such as post disaster, can be life-threatening.[2]

For example, Bangladesh independence after the 1970 cyclone victims had been angry at discrimination from the Pakistan government, initiated a civil war in East Pakistan to separate from Pakistan.[11]

The potency of post-disaster social conflict could not be considered further as a myth.The post-disaster social dynamics have varied social impacts, it could reduce pre-disaster conflicts (conflicts reduction in Sri Lanka and Aceh, Indonesia after the 2004 Indian Ocean tsunami[7]) or emergence of new conflict (the occurrence of pogrom after the 1923 Tokyo earthquake, Japan[12] and the independence of Bangladesh after the 1970 cyclone[11]).

What could be learned from the phenomenon shown in this study is that the perception of inequality has the potential to cause social friction. As in the Social Support Deterrence Deterrence theory, the existence of social distress could be reduced by perceived support, not directly dependent to received support. It must be understood by the government and aid agencies that subjective perception of "being helped" is very important to reduce distress caused by disasters. The steps that need to be taken are 1) Identification of pre-disaster social situations; 2) Mitigation and disaster preparation that include social factors which found in identification process as a part of risk (hazard and vulnerability); 3) Periodic assessment and regularly updating of the victim's need; 4) Utilizing the period of temporary peace to increase solidarity and form positive community; 5) Dialogue positively involving all group representatives, especially groups that are often marginalized, such as women, children, elderly, low socioeconomic status, ethnicity and beliefs, or physical and psychological disability groups.

Because post-disaster social risks are often unpredictable and unclear, governments and agencies involved in disasters are expected not only to pay attention to post-disaster recovery, but also to prevent post-disaster conflicts which able to make recovery more complex.

There is still room for further in-depth research by interdisciplinary experts which able to synthesize the concept and mechanism of social dynamics in natural disaster situation.

CONCLUSION

Natural disasters affect all aspects of human being. Natural disasters could cause social dynamics that are often unpredictable. Natural disasters could bring altruistic solidarity to society, but this condition could only last temporarily, and it is not impossible to turn into social friction and conflict after external aid arrived. Assessing pre-disaster social condition, planning the prevention programs, improving solidarity situation that is formed, and dialogue involving all social groups in order to understand the subjective perceptions of social fairness are the steps that could be taken to minimize post-disaster social distress.

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Conflict of Interests

There is no conflict of interest and funding in the writing of this article.The ethical clearance has not been done for this paper.

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Original Article

ALBUMIN, LEUKOSIT, AND PROTROMBIN AS PREDICTORS OF SEPSIS MORTALITY AMONG ADULT PATIENTS IN SOETOMO GENERAL HOSPITAL, SURABAYA, INDONESIA

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ABSTRACT

Introduction: Sepsis is presented as acomplex and multifactorial syndrome where the morbidity and mortality rates still high around the world. Strong evidencewith regard to early predictive factors for mortality and morbidity is rare to be provided. **Objective:** The aim of this study was to analyse the prominent predictors from the values of laboratory findings among patients with sepsis**. Method and Material:** The study was aan analytic observational study with a case-control approach. The data were extracted from patients's medical records between 2014 and 2015. This study involved 50 septic patients admitted to Dr. Soetomo General Hospital, Surabaya, Indonesia. Blood urea nitrogen (BUN), creatinine serum, albumin, leukocytes count, haemoglobin, hematocrite, platelets, sodium, potassium, chloride, prothrombin time (PT), and activated partial thromboplastin time (APTT) were collected from blood samples. Logistic regression was used to estimate sepsis related mortalities frequencies and the relationship between laboratory findings and under 28-days mortality. **Result and Discussion:** From 50 patients, 22 patients were died (44%).The regression model was intially conducted using all three biomarkers as covariates, then using backward elimination, the covariate with the highest p-value was eliminated. The process was repeated until covariates with statistically significant remained. Multivariate analysis showed that albumin, leukocytes count, and prothrombin time (PT) were the findings associated with high mortality. The independent predictors of mortality identified by further multivariate regression analysis were taken into account as a lower than 3.5 g/dL of albumin, above12.000/µL of leukocytes count, and prolonged more than 14 seconds of prothrombin time; with p value <0,05 respectively (0.029; 0.049; 0.027). **Conclusion:** Notably, low albumin level, elevated levels of leukocytes, and prolonged prothrombin time were clinically considered as independent predictors of mortality among adult patients with sepsis.

Keywords: Albumin, Leukocyte, Mortality, Prothrombin Time, Sepsis.

ABSTRAK

Pendahuluan: Sepsis digambarkan sebagai sindrom yang kompleks dan multifaktorial dimana angka morbiditas dan mortalitas tetap tinggi di seluruh dunia. Bukti yang kuat sehubungan dengan faktor prediktif awal untuk mortalitas dan morbiditas jarang tersedia. **Tujuan:** Tujuan dari penelitian ini adalah untuk menganalisis prediktor yang menonjol dari nilai-nilai temuan laboratorium di antara pasien dengan sepsis. **Metode dan Bahan:** Penelitian ini merupakan studi observasional analitik dengan pendekatan case-control. Data diambil dari rekam medis pasien antara tahun 2014 dan 2015. Penelitian ini melibatkan 50 pasien sepsis yang dirawat di Rumah Sakit Umum Daerah Dr Soetomo, Surabaya, Indonesia. Blood Urea Nitrogen (BUN), serum kreatinin, albumin, jumlah leukosit, hemoglobin, hematokrit, platelet, natrium, kalium, klorida, prothrombin time (PT), dan activated partial tromboplastin time (APTT) dikumpulkan dari sampel darah. Regresi logistik digunakan untuk memperkirakan tingkat kematian sepsis dan hubungan antara temuan laboratorium dan mortalitas 30 hari. **Hasil dan Pembahasan:** Dari 50 pasien, 22 didapatkan meninggal (44%). Model regresi pertama kali disusun menggunakan biomarker sebagai kovariat. Dengan menggunakan metode eliminasi mundur, kovariat dengan nilai-p tertinggi dihilangkan dan modelnya diarahkan ke tiga biomarker yang tersisa. Proses ini diulang sampai terdapat hanya biomarker yang secara statistik signifikan dipertahankan dalam model. Analisis multivariat menunjukkan bahwa albumin, jumlah leukosit, dan prothrombin time (PT) adalah temuan yang terkait dengan mortalitas yang tinggi. Prediktor independen mortalitas diidentifikasi oleh analisis regresi multivariat, lebih lanjut dinyatakan: albumin yang lebih rendah

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dari 3,5 g/dL, jumlah leukositdi atas 12.000/µL, dan prothrombin time memanjang lebih dari 14 detik; dengan nilai p <0,05;berturut-turut (0,029; 0,049; 0,027). **Kesimpulan:** Khususnya, kadar albumin yang rendah, peningkatan kadar leukosit, dan prothrombin timeyang memanjang secara klinis dianggap sebagai prediktor independen mortalitas di antara pasien dewasa dengan sepsis.

Kata kunci: Albumin, Leukosit, Kematian, Waktu Prothrombin, Sepsis

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INTRODUCTION

Sepsis is presented as acomplex and multifactorial disease where themorbidity and mortality rates remain high around the world.[1]Sepsis is still an extraordinary challenge in the intensive care unit because of the high mortality rate regardless of providing optimal care. The use of serum biomarkers has significantly increased the ability of doctors to diagnose and predict the prognosis of sepsis.[1]

In clinical practice, the number of leukocytes has been most widely used as a biomarker that is sufficient to guide the assessment of clinical progress among septic patients, even in addition to other laboratory parameters such as lactate acid, procalcitonin and c-reactive protein. Nevertheless, such parameters obviously remain unavailability particularly in the remote area and led to noteworthy impact on the hospital cost.In Indonesia, a previous study reported that the proportion of patients with sepsis was accounted for 27.08% severe sepsis,14.58% septic shock,while 58.33% remaining on the state of sepsis, which the mortality rate rangedof 40-60% in severe sepsis.[2]

Complex pathophysiology of sepsis, which need more than one biomarker to be able to describe host responses to this diseases. Combination ofseveral biomarkers into certain classification rule will improve the accuracy and applicability. The purpose of this study blood samples. A multivariate logistic regression was conducted to estimate correlation between covariates of laboratory findings and under 28-days sepsis related mortality.

was to obtain predictive value using combination of several biomarker, such as: leukocyte count, albumin, and coagulation factors, which associated with under 28-days mortality in septic patients. Strong evidence with regard to early predictive factors for mortality and morbidity is scarcely provided. The aim of this study is to analyse the prominent predictors from the values of laboratory findings among patients with sepsis.

MATERIAL AND METHOD

The study was a analytic observational study with a case-control approach. The data was extracted from patient's medical records between 2014 and 2015. This study involved 50 septic patients admitted to Soetomo General Hospital, Surabaya, Indonesia.

Adult patients who fulfilled the criteria for sepsis were collected. Adult patient who have received antibiotics for more than 24 hours before the blood sample takenwas excluded. Baseline and demographic data were collected, sucah as: sex, age, admission category, main site of infection, and comorbidity.

Blood urea nitrogen (BUN), creatinine serum, albumin, leukocytes count, haemoglobin, hematocrite, platelets, sodium, potassium, chloride,activated partial thromboplastin time (APTT), and prothrombin time (PT) were collected from

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RESULT AND DISCUSSION

The author used multivariate logistic regression to model biomarker capabilities to identify patients who had outcome of mortality under 28 days. The regression model was initially constructed using whole biomarkers provided as covariates. The covariate with the highest p-value was removed using backward elimination method, and the model was continued to the remaining three biomarkers. This process is repeated until the author got the biomarkers which are statistically significant remain in the model.

Table 1. Leukocyte Count, Prothrombin Time (PT), And Albumin Predictive Performance For Mortality In Sepsis Patient

Biomarker	All N=50	Survivor n=28	Non Survivor n=22	*P*	AUROC	Cut-off
Leukocytes	13370	12463.57	14523.63	0.049	0.606	12800
Albumin	2.92	3.21	2.55	0.029	0.750	2.217
PT	19.81	18.19	21.86	0.027	0.649	14.2

Note. Description of the two groups was done using the Compare Means test. AUROC = area under the receiver operating characteristic curve, PT = prothrombin time

According to result of regression equation, the author converted the probability of under 28-days sepsis related mortality, which represents final predictor of sepsis related mortality.

In Table 1, from 50 patients, 22 patients were died (44%). Multivariate analysis showed that albumin, leukocytes count, and prothrombin time (PT) were associated with high mortality. The independent predictors of mortality identified by further multivariate regression analysis were taken into account as a lower level of 3.5 g/dL albumin, *p value* 0.029; above 12.000/µL of leukocytes count, *p values* 0,049; and prolonged 14 seconds of prothrombin time, *p value* 0.027.

The AUROC (Area Under The Receiver Operating Characteristic Curve) model from sepsis related mortality and each of the constituent biomarkers for the prediction of under 28 days mortality is shown in Figure 1. The author found that the AUROC is from the

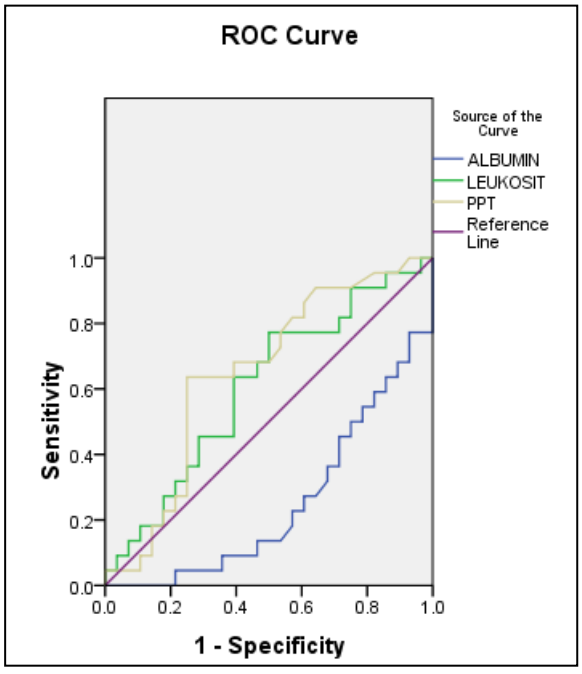

Figure 1. Reciever Operating Characteristic (ROC) Curve of leukocyte count, prothrombin time, and albumin level

model: leukocyte, prothrombin time (PT), and albumin was 0.606; 0.649; and 0.750 (95% CI), which suggested fairly good model discrimination. The sepsis mortality scores out

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perform biomarkers of individual constituents in predicting mortality under 28 days; These biomarkers show moderate performance to good performance when used.

In this observational analytic study, the author collect the historical data of 50 patients with sepsis and studied three biomarkers on their hospital admissions which used in the prediction of those patients who had the risk of under 28-days mortality. Sepsis related mortality predictors. using baseline leukocytes count, prothrombin time (PT) and albumin levelcould reflect the outcome ofunder 28-days mortality with a fairly good performance.

Biomarkers, especially a combination of the two components, can provide more reliable guidance for predicting the outcome; mortality in sepsis. Recent studies,[3,4] also stated that combination biomarkers performed better than other clinical scores used routinely in predicting sepsis related mortality.

Sepsis itself, often ensures disrupted coagulation function, ranging from mild changes to severe disseminated intravascular coagulation (DIC). Septic patients with severe DIC may experience the thromboembolic disease sign, as fulminant purpura or clinically obscure microvascular fibrin deposition, which strongly indicates multiple organ dysfunction. On the other hand, severe bleeding may be the main symptom, or even bleeding and thrombosis.[5] The disrupted coagulation mechanism, specifically DIC, is an important predictor and on of possible clinical outcome in patients with severe sepsis.[6]

Initiation of coagulation activated by proinflammatory cytokines such as IL-6, depends on tissue factors (TF). Increased thrombin formation is caused by tumor necrosis factor (TNF-α) which breaks down the damaged physiological anticoagulant mechanism while the spread of fibrin deposition in microvasculature is caused by inadequate fibrin degradation, as a result of the inhibited fibrinolytic system.[6]The complex TF-factor-VIIa catalyzes the activation of both factors IX and factors X, increasing the activation of factor X and prothrombin, respectively.[8]

Our results are related to the combined use of leukocyte counts, prothrombin time (PT) and albumin level activity for sepsis related mortality prediction. Even though the results are encouraging, this study still have limitations. The prediction of sepsis deaths that we produce is that single data is predicted, but whether it can be generalized to an external population was unknown. Clinical outcomes depend on the patient management, which can vary between each health center; thus, lack of standardization may have disrupted our results. However, the 44% mortality rate found in the population is almost representing to that condition observed in Indonesia.[2] Even though the author tried to control confounders by other clinical variables by modeling sepsis death scores in the logistic regression model. The author might find some impendiments to explain the other unmeasured confounders factors. Beside these findings, since this study using convenience sample, selection bias might lead to ledd representative population. Thus, further research is needed to improve and validate the clinical applicableness of this sepsis related mortality predictor in reflecting the clinical outcome in sepsis treatment.

CONCLUSION

Notably, low albumin level, elevated levels of leukocytes, and prolonged prothrombin time were clinically considered as independent predictors of mortality among adult patients with sepsis. Further research is needed to develop these findings and to assess whether these sepsis mortality predictor derived from

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biomarkers, into certain classification and score, then can be successfully integrated with physicians' clinical practice to improve reflection, prediction and clinical decision making at the patient's clinical setting.

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Conflict of Interest

There is no conflict of interest to be declared

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Original Article

PAIN TREATMENT ON TRAUMA PATIENT IN DR. SOETOMO GENERAL HOSPITAL EMERGENCY ROOM

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ABSTRACT

Introduction: Uncontrolled pain has many negative effects to the body. The Guideline of Pain Management has been specifically arranged, but assessment and pain treatment in the Emergency Room (ER) have not adequate yet. Integrated pain assessment before and after treatment is very important in monitoring pain management effectiveness. **Objective:** The aim of this study was to determine pain score of emergency patients before and after treatment. This study was also conducted to record the treatment timing that was given by the paramedics in the emergency room. **Method and Material:** This study was a description research with 40 trauma patients as samples in the ER at Dr. Soetomo Hospital. Patient's pain level was measured twice, before the treatment and an hour after that. The pain level was measured using Visual Analog Scale (VAS). Patients were given ketorolac 30mg intravenous as the treatment. **Result and Discussion:** There were2.5% of the patients VAS 1 and the other 12.5% VAS 10. An hour after treatment 20% of the ER patients were free of pain and the rest 7.5% VAS 6. The average of VAS before the treatment were 6.38 ± 2.1and an hour after later they decreased to 2.23 ± 1.7. There were only 67.5% of the ER patients that were treated in the 1st hour, 17.5% of them were treated in the 2nd hour, the other 10% were treated in the 3rd hour, and the last 5% of them were treated in the 4th hour. **Conclusion:**The average value of pain was decreased when one hour after administration of pain therapy by paramedics, but therapy at different times showed no difference in the level of pain reduction that can be inferred.

Keywords: Emergency Room, Pain, Time, Visual Analogue Score.

ABSTRAK

Pendahuluan: Rasa nyeri yang tidak terkendali memiliki banyak efek negatif pada tubuh. Pedoman manajemen rasa nyeri telah secara khusus diatur. Namun, penilaian dan pengobatan nyeri di Instalasi Rawat Darurat (IRD) belum memadai. Integrasi penilaian rasa nyeri sebelum dan setelah perawatan ini sangat penting dalam memantau efektivitas manajemen rasa nyeri. **Tujuan:** Studi ini dilakukan untuk menentukan tingkat nyeri pasien gawat darurat sebelum dan setelah pengobatan, dan mengetahui waktu terapi nyeri oleh paramedis. **Metode dan Bahan:** Penelitian ini adalah penelitian deskripsi. Studi ini prospective observasional dengan 40 pasien trauma sebagai sampel di IGD Rumah Sakit Dr. Soetomo. Tingkat nyeri pasien diukur dengan Visual Analog Skor (VAS) dan mencatat waktu terapi, dalam satu jam kemudian, VAS akan mengukur lagi. Pasien diberikan intravena ketorolac 30mg sebagai terapi. **Hasil dan Pembahasan:** Sebelum terapi, ada 2,5% dari 40 pasien memiliki VAS 1 dan 12.5% memiliki VAS 10, satu jam setelah terapi hanya 20% dari pasien yang bebas dari rasa nyeri dan ada 7,5% dari pasien yang memiliki VAS 6. Rata-rata VAS sebelum pengobatan adalah 6.38 ± 2.1, menurun menjadi 2.23 ± 1.7 ketika satu jam setelah pengobatan. Ada 67.5% (n = 27 dari 40) pasien yang diberi perlakuan pada jam pertama, sementara 17,5% (n = 7) pada jam kedua, 10% (n = 4) pada jam ketiga dan 5% dari pasien (n = 2) pada jam keempat. **Kesimpulan:** Nilai rata-rata rasa nyeri menurun ketika satu jam setelah pemberian terapi nyeri oleh paramedis. Tetapi, terapi pada waktu yang berbeda menunjukkan tidak ada perbedaan dalam tingkat pengurangan rasa sakit yang dapat disimpulkan.

Kata kunci: Instalasi Rawat Darurat, Nyeri, Waktu, Visual Analog Skor.

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INTRODUCTION

Pain is a problem that happened often to the patients in hospital daily, especially in Emergency Room (ER). The perception of pain, which is felt by individual, varied depending on genetic factors, gender, age, psychological aspects, pain history, culture, beliefs, mood and also the ability to cope with the pain.[1,3,15] Uncontrolled pain has many negative effects to the body.[9] While the pain control capabilities is varied for each individual, one of them depend on the experts who deal with the pain.[13] Measuring the pain enables doctors and researchers to show a statistically and clinically significant treatment effects. Visual Analog Score is usually used to measure the severity of pain.[17]

How to cope with pain in emergency case is continue to be developed. The subjective of Patient's level of pain must be measured with the correct method in order for the grant of a therapy can provide the desired results. This current era, pain management guidelines already arranged specific to the each type of preoperative pain. However, Pain's assessment and treatment in the ER have not been done. The integration of pain assessment before and after the treatment is very important to monitor its effectiveness.[4,5] This research was conducted to find out the patient's level of pain before and after therapy, and knowing the portrayal time of administering the pain therapy by health workers in dealing with patients who come to ER. So the results can be obtained a decrease, increase, or stay after the giving of the therapy by medical staff at ER.

MATERIAL AND METHOD

This was a descriptive study with 40 trauma patients in the Dr Soetomo General Hospital surgical emergency room as the research samples. There were40 traumatical patients in Emergency Room Dr. Soetomo Hospital Surabayafrom January to February 2014. The level of pain was measured twice, the first one was when the patient arrived in the ER, the second one was an hour after the pain treatment. The severity of pain was measured using VAS. After the measurement, ketorolac30 mg intravenous was given.

Inclusion criteria were trauma patient, aged 18-64 y.o, with GCS>9.Patient's data was collected through direct interview and patient's medical record.

Data collection sheet were composed of patient consent, day and date the data collected, basic patient information (name, age, gender, level of education), type of trauma, the time patient arrived in the ER, patient's level of pain when they were arrived, the length of time before ketorolac 30 mg intravenous was being administered, and patient's level of pain an hour after the administration of ketorolac. The data obtained were managed with Microsoft Excel and SPSS.

RESULT AND DISCUSSION

The Characteristics of Research Subjects

The scale of VAS had been provedto be sensitive and reliable, and it was considered to be the best option for elderly patients, including those with mild to moderate cognitive disorder. This type of scale used a description such as: 'no', 'mild', 'moderate', 'severe', 'torture'.[10] Therefore, the researchers split the pain level scale, VAS scales (0-10) divided into 4 groups by the researchers, they were 'no pain' (VAS 0), 'mild pain' (VAS 1 – 3), 'moderate pain' (VAS 4 – 7), and 'severe pain' (VAS 8 – 10).

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Table 1. Distribution of Pain Level Based on Patient's Age

Pain Level	Group of Age			
	18 - 29 n = 13	30 - 41 n = 9	42 - 53 n = 13	54- 64 n = 5
No pain	0%	0%	0%	0%
Mild pain	0%	0%	15%	0%
Moderate pain	77%	56%	69%	80%
Severe pain	23%	44%	15%	20%

Table 2. Distribution of Pain Level based on The Patient's Gender

Pain Level	Male n = 30	Female n = 10
No pain	0%	0%
Mild pain	3,3%	10%
Moderate pain	76,7%	50%
Severe pain	20%	40%

Table 3. Distribution of Pain Level based on Patients' Levels of Education

Pain Level	Bachelor n = 2	Senior High School n = 19	Junior High School n = 10	Primary School n = 7	Uneducated n = 2
No pain	0%	0%	0%	0%	0%
Mild pain	0%	5%	10%	0%	0%
Moderate pain	100%	63%	70%	86%	50%
Severe pain	0%	32%	20%	14%	50%

Patient's aged distribution (table 1) were 32.5% patients aged 18 to 29 years, 22.5% aged 30 to 41 years, 32.5% aged 42 to 53, and 12.5% aged 54 to 64 years. From the gender distribution data (table 2), there were 75% male patients, and 25% female patients. Level of patients' education being sampled varied from un-educated to bachelor (table 3), but the distribution of each level of education was not balanced.

The Results of Pain Level Measurements

Based on table 4, before the treatment, the pain levels were varied from level 1 (2,5%) to level 10(12,5%). An hour after ketorolac 30 mg intravenous were given, 20% of the patients were pain free whereas 7,5% of them had pain levels of 6. The calculation of pain level average before the therapy that was being decreased of 6.38 to 2.23 one hour after being given ketorolac 30 mg intravenous as an analgesic.

Tabel 4. Patients' Pain Level Before and After the Treatment.

Criteria	Pain Before the Treatment	Pain After the Treatment
VAS 0	0.0	20.0
VAS 1	2.5	17.5
VAS 2	2.5	22.5
VAS 3	0.0	17.5
VAS 4	10.0	12.5
VAS 5	15.0	2.5
VAS 6	30.0	7.5
VAS 7	15.0	0.0
VAS 8	7.5	0.0
VAS 9	5.0	0.0
VAS 10	12.5	0.0
Minimum	1	0
Maximum	10	6
Mean	6.38	2.23
Std. Deviation	2.108	1.761
N	40	40

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The Result of Pain Therapy Timing

The data showed in table 5 that the majority of the patient (67,5%) were treated within the first hour, the other 17,5% were treated within the second hour, 10% of them were treated within the third hour, and the last 5% were treated after the third hours in the Emergency Room.

Table 5. The Patient's Pain Level Distribution Based on The Pain Therapy Timing.

Variable	1st Hour		2nd Hour		3rd Hour		4th Hour	
	Before	After	Before	After	Before	After	Before	After
Min	1.00	0.00	5.00	1.00	5.00	0.00	4.00	0.00
Max	10.00	6.00	7.00	4.00	10.00	6.00	5.00	1.00
Mean	6.5185	2.2222	6.1429	2.4286	6.7500	2.7500	4.5000	0.5000
SD	2.3758	1.8045	0.69007	1.27242	2.21736	2.5000	0.70711	0.70711
N	27	27	7	7	4	4	2	2

*Description table: n = number of patients

In the ER, some trauma patients reported their pain level as high as 10, that usually happened in chronic cancer pain patients, due to their distrust against the paramedics. The high level of pain were reported by the patient, purposed to get treated immediately.[11]

The factors that can be interfere the pain levels are age, gender, education level, and psychologic.[15] Pain perception will decrease along with the aging process. Age differences indicate the differences in the modulation of pain. That is because of brain parenkim atrophy that happened due to the aging process. The depletion of the substantia grisea happened in some areas, involved in pain processing, such as insula, gyrus cingulatum, posterior parietalis lobe and Senatosensory cortex.[2] According to the gender, hormonal factors act as a pain modulator in ventrolateral periaquaductus grisea area.[6] Men had a connectivity increased in periaquaductus grisea, the amygdala and the putamen, while women did not increase.[8] Some of these factors could not be taken due to the limited number of conclusions by the sample and unequal characteristics of research subjects.

On some occasion, patients may still feel some pain even if they hadbeen taken the pain killer. This condition may happened depends on the type of traumatic experience and their ability to control the pain.[1,3,13,15] In case of pain, there must be a quick oral nonopioid giving advance according to WHO's Pain Relief Ladder. Guide of WHO claimed to be able to provide 80-90% effectiveness in lowering the patient's pain level.[16]Patient in ER gave ketorolac 30 mg intravenous for the systemic analgesic and there was no obtained of the opioids use although for patients with moderate and severe levels of pain. These conditions might be happened because the health workers were afraid of opioid and its side effect. The health worker may not be able to decide whether the patients really need the opioid or just faking it.[12] However, the therapy which were given by the paramedics in the ER of Dr. Soetomo General hospital, abled to lower the patient average pain level from 6,38 ± 2.1 to 2,23 ± 1.7 an hour after the treatment.

The factor that can interfere with pain handling in the ER was the intrinsic barrier

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from the medical personels. This condition may happen due to inadequate knowledge of pain, the absence of standard pain handling procedure, and their lack of accountability in terms of standard of care.[14] Despite of the fact that 50% patients treated within the first hour in the ER, there were still 5% of them who got treated after 4 hours. This might be happened because the patient had to follow through various physical and laboratory examination first before treated with pain mediation and iv fluid.

CONCLUSION

The average level of pain before therapy was 6,38 ± 2.1. That average value decreased and became 2,23 ± 1.7 at one hour after being givenketorolac 30 mg intravenous as pain therapy. However, the decrease of patient pain level who was given therapy in a different hour did not show a difference that can be inferred.

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Original Article

PAIN LEVEL OF POSTOPERATIVE ORTHOPEDIC PATIENTS AT DR. SOETOMO GENERAL HOSPITAL

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ABSTRACT

Introduction: Postoperative pain is the most undesirable consequence of the surgery. If it is not managed properly, it can lead to a long healing. However, assessment and treatment of postoperative pain in surgical wards still have not received attention. Differences in patient's pain level after surgery and after being transferred to the surgical ward is very important in monitoring the effectiveness postoperative pain management. **Objective:** This study was conducted to determine the overview of pain level experienced by patients following orthopedic surgery and to know the individual factors that can affect the patient's pain level. **Method and Material:** This research was observational analytic with 43 orthopedic postoperative patients as a sample. The Patients' pain level was measured by the Numeric Rating Scale (NRS) at one hour after surgery and 24 hours after surgery. **Result and Discussion:**The Pain level one hour after surgery varied between pain level 0 as much as 53% to pain level 8 as much as 4.7%. The results of measurements of pain 24 hours after surgery only 23.3% of the patients who did not complain of pain, and there was a patient who experienced pain level 10. The results of the statistical calculation, the difference between the level of pain one hour and 24 hours post-surgery obtained value of p=0.037 (p<0.05). **Conclusion:** There was a significant difference between the pain level at one hour and 24 hours post-surgery. It might be due to the process of peripheral and central sensitization in patients with delayed pain management. It also may be influenced by individual factors as well as medical personnel.

Keywords: NRS, Patients, Pain Level, Pain, Postoperative Pain.

ABSTRAK

Pendahuluan: Nyeri post operasi adalah konsekuensi paling tidak diinginkan dari pembedahan, dan jika tidak dikelola dengan baik dapat menyebabkan penyembuhan yang lama. Namun, penilaian dan penanganan nyeri post operasi di bangsal bedah masih belum mendapat perhatian. Perbedaan tingkat nyeri pasien setelah operasi dan setelah pasien dipindah ke bangsal bedah sangat penting dalam memantau efektivitas manajemen nyeri post operasi. **Tujuan:** Penelitian ini dilakukan untuk mengetahui gambaran tingkat nyeri yang dialami oleh pasien setelah operasi ortopedi dan mengetahui faktor individu yang dapat berpengaruh pada tingkat nyeri pasien. **Metode dan Bahan:** Penelitian ini merupakan penelitian analitik observasional dengan 43 pasien post operasi ortopedi sebagai sampel. Tingkat nyeri pasien diukur dengan Numeric Rating Scale (NRS) pada satu jam setelah operasi dan 24 jam setelah operasi. **Hasil dan Pembahasan:** Tingkat nyeri saat satu jam post operasi bervariasi antara tingkat nyeri 0 sebanyak 53% ke level nyeri 8 sebanyak 4,7%. Hasil pengukuran nyeri pada 24 jam setelah operasi hanya 23,3% dari pasien yang tidak mengeluh nyeri, dan ada pasien yang mengalami tingkat nyeri 10. Hasil pengukuran nyeri 24 jam setelah operasi hanya 23,3% dari pasien yang tidak mengeluh nyeri dan ada pasien yang mengalami tingkat nyeri 10. Hasil perhitungan statistik perbedaan antara tingkat nyeri satu jam post operasi dan 24 jam post operasi diperoleh nilai p=0,037 (p<0,05). **Kesimpulan:** Ada perbedaan signifikan antara tingkat nyeri pada satu jam post operasi dan 24 jam post operasi. Mungkin karena terjadi proses sensitisasi sentral dan perifer pada pasien dengan manajemen nyeri yang kurang adekuat atau tertunda. Hal ini juga mungkin dipengaruhi oleh faktor individu maupun tenaga medis.

Kata kunci: NRS, Pasien, Tingkat Nyeri, Nyeri, Nyeri Post-Operasi.

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INTRODUCTION

Pain is a part of the human impression of everyday living and a manifestation of a pathological process.[1] The International Association for the Study of Pain (IASP) defined pain as an unpleasant sensory and emotional experience related to actual or potential tissue damage.[2] Pain is very subjective depending on the perception of each individual.

Pain is very unique because it can cause suffering for those who feel it, but on the other hand pain can also show benefits.[1] Pain has some functions as a protection, defensive mechanism, and diagnostic support mechanism. As a protection, the sense of pain allows a person to react to a trauma or cause of pain, so a person can avoid damage of body tissue. As a defensive mechanism, it allows immobilization of organs that are inflamed or broken so that the sensible feeling will subside and can heal quickly. As a diagnostic guide, pain can show an abnormal location quickly[3]. Although the pain has benefits, the presence of pain must be immediately removed so that not to interfere.

Surgical procedures are associated with tissue injury and the majority of patients who are operated on have some degree of pain after surgery. Many patients can suffer moderate pain or even severe pain after surgery. Research had shown that pain treatment is lacking could cause acute and chronic negative effects.[4]

Pain after surgery (postoperative pain) is a specific type of acute pain. More than 75% of patients undergoing surgery suffered from acute pain.[5] Acute postoperative pain could continue to be chronic postoperative pain in 10-50% of individuals after general surgical procedures, with 2-10% of patients had severe chronic postoperative pain.[4] The effective prevention of postoperative acute pain is one of the important things to prevent chronic or persistent postoperative pain.

The methods often used to measure pain include: NRS or VAS, VDS, FLACC, and FRS.[6] By knowing the level of pain appropriately, it is expected that the therapy is also appropriate so the patient's condition is not getting worse because of the negative effects of the uncontrolled pain.

Postoperative pain is the most undesirable consequence of surgery, and if it is not managed adequately it can lead to prolonged healing and increased length of hospital stay[7]. The survey continues to reveal that postoperative pain is still less successfully handled throughout the world.[8] More than 20-years, the American survey showed that only one in four patients had adequate healing from postoperative pain. It made the Recovery Room (RR) protocol to include pain as the fifth vital sign that needs to be handled before the patient is taken to the ward.

In a study conducted by Schoenwald & Clark (2006), clinical practice in the assessment and treatment of pain was still lacking. Although not many patients complain of postoperative pain, the fact that the weakness of management of pain is an issue of concern. In addition, The England Surgeons, Royal College and the College of Anesthetists (1990) published documents that highlighted the failure to effectively assess and manage pain, which stated that the treatment of postoperative pain at British Hospital was inadequate and had not progressed significantly for many years[9]. Whereas the difference in the patient's pain

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level between the 1 hour postoperative period and the 24 hour postoperative period is not clearly known.

Because of this, further research is needed on postoperative pain to determine the general picture of pain in postoperative patients related to the management of postoperative pain performed at the Dr. Soetomo General Hospital Surabaya. The researchers was going to look for an overview of the level of pain in patients post elective surgery and also factors that can influence.

MATERIAL AND METHOD

This research is an observational analytic study and a cross sectional approach. The sample in this study was postoperative patients with extremist orthopedics in the Recovery Room of the Integrated Central Surgical Building and Surgical Ward at the Dr. Soetomo General Hospital. The sample data in this study was carried out by the total sampling method during the period between March 19 and April 30, 2015. The inclusion criteria were elective orthopedic patients who underwent surgery in the extremity section, had a fairly good awareness and were able to communicate, and entered into the criteria of adults (ages 18-64 years). The variables in this study were the results of measuring the pain level one hour postoperatively and the pain level 24 hours postoperatively. Data collection used data collection sheets (LPD) and Numeric Rating Scale (NRS) to measure pain levels. The data sources used in this study were primary data from the results of direct interviews with patients at one hour post surgery in the recovery room and 24 hours postoperatively in the surgical ward and secondary data from the patient's anesthesia status. Then the data was entered into the SPSS 17.0 program and analyzed using the Wilcoxon Signed Rank Test.

RESULT AND DISCUSSION

Table 1. Distribution of pain measurement results during preoperative, 1 hour postoperative, and 24 hours postoperative.

Pain Level	Preoperative		1 Hour Postoperative		24 Hour Postoperative	
	N	%	n	%	n	%
0	27	62.8%	23	53.%	10	23.3%
1	3	7.0%	3	7.0%	7	18.6%
2	5	11.6%	6	14.%	8	16.3%
3	4	9.3%	1	2.3%	5	11.6%
4	1	2.3%	3	7.0%	2	4.7%
5	1	2.3%	3	7.0%	3	7.0%
6	1	2.3%	1	2.3%	5	11.6%
7	1	2.3%	1	2.3%	1	2.3%
8	1	2.3%	2	4.7%	1	2.3%
9	0	0.0%	0	0.0%	0	0.0%
10	0	0.0%	0	0.0%	1	2.3%

Table 1 showed the results of measuring the level of pain in 43 patients before surgery, 1 hour after surgery, and 24 hours after surgery. The pain scale displayed that the NRS scale (Numeric Rating Scale) which was starting with a score of 0 which means no pain up to a score of 10 which means that pain was unbearable. The data in the table were presented in frequency and percentage. From the table, the pain level felt by patients during the preoperative visit and 1 hour postoperative were ranged in score of 0-8. There were no patients who had pain in the scores of 9 and 10. At 1 hour postoperative many patients did not complain of pain (53%). While the measurement of pain at 24 hours postoperative was found 1 person who had pain at score of 10 (2.3%).

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Table 2 showed patients who did not feel pain initially and still did not feel pain in the measurement of 24 hours postoperative were 9 patients. Then, patients who did not feel pain initially and turned into pain were 14 patients, distributed 9 patients with mild pain, 4 patients with moderate pain, and 1 patient with severe pain. Patients who initially complained mild pain were 10 people, there were 6 patients with mild pain, 3 patients with moderate pain and 1 patient with severe pain. From 7 patients who complained of moderate pain at the beginning, most of them turned into mild pain as many as 4 patients. It could be seen that there was a decreasing in mild pain from being moderate pain. In addition, there was also a decreasing in pain level in patients who initially complained severe pain as many as 3 patients became mild pain and moderate pain. In tables 2 and 3 the NRS pain scale was grouped into four, namely no pain (score 0), mild pain (1-3), moderate pain (4-6), severe pain (7-10).

Table 2. Changes in the distribution of the number of patients from pain level on 1 hour postoperative to the pain level on 24 hours postoperative

Pain level on 1 hour postoperative	Pain level on 24 hour postoperative				Total
	No pain	Mild pain	Moderate pain	Severe pain	n
No pain	9	9	4	1	23
Mild pain	0	6	3	1	10
Moderate pain	1	4	1	1	7
Severe pain	0	1	2	0	3
Total	10	20	10	3	43

Changing in distribution globally could be seen in table 3. At the initial pain level, patients who gave a non-painful response were in the first rank (53.5%), exceeding half of the respondents and the rest who complained of mild pain 23.3%, moderate pain 16 3%, and severe pain 7%. Pain level distribution in table 3 showed a decreasing in the percentage of patients who were not painful from 53.5% to 23.3%. The results of statistical calculations that can be seen from table 3 also showed that more patients complain of pain 24 hours postoperative compared on 1 hour postoperative. It was seen from mean of the data on 24 hours postoperative giving a score greater than 1 hour postoperative. In analytic calculations also obtained the results of p <0.05 is 0.037 which means that there is a significant difference between the pain level on 1 hour postoperative and the pain level on 24 hours postoperative.

Table 3. Results of statistical analysis of 1 hour postoperative pain level and 24 hour postoperative pain level

	No pain	Mild pain	Moderate pain	Severe pain
Pain level on 1 hour postoperative	23 (53.5%)	10 (23.3%)	7 (16.3%)	3 (7%)
Pain level on 24 hour postoperative	10 (23.3%)	20 (46.5%)	10 (23.3%)	3 (7%)
	Mean	**Std. Deviation**	**P**	
Pain level on 1 hour postoperative	1.77	0.972	0.037	
Pain level on 24 hour postoperative	2.14	0.861		

*p<0,05, there are significant differences

The most number of patients who complain of painlessness than complain of pain in the initial measurement of 1 hour postoperative can be caused by a factor in the patient's level of consciousness due to the effects of anesthetic drugs and the psychological factors of the patient. The effect of anesthetic drugs that still exist can affect patient awareness and pain perception felt during measurement. Anxiety can also be an influential factor. The measurement of the initial pain level was carried out in the recovery room where the

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patient was monitored and observed until the patient's condition was stable and qualified to be transferred to the surgical ward. Closed monitoring carried out by nurses and doctors there provides a sense of secure to patients, so that it affects patients in perceiving acute postoperative pain. In table 1 showed a decreasing in the percentage of patients who are not painful, which means more patients complain of pain than at 1 hour postoperative. In addition, there is also an increasing in the percentage of patients who has mild pain and moderate pain. This provides information that there are factors that influence the management of postoperative pain in the surgical ward.

The results of statistical calculations that can be seen from table 3 also showed that more patients complain of pain on 24 hours postoperative compared to 1 hour postoperative. From the mean data at 24 hours postoperative giving a score greater than 1 hour postoperative. In analytic calculations found a significant difference between the pain level on 1 hour postoperative and the pain level on 24 hours postoperative. These differences are influenced by factors from the patient, experience of previous pain, culture, beliefs, mood, and also the ability to withstand the pain.[10]

Postoperative pain is one category of acute pain. Surgery activates the stress response to postoperative pain. Prolonged postoperative pain produces the changing in the nervous system, which converts normal physiological responses to dangerous stimuli. Inflammation or nerve damage results in changes in sensory processing at the peripheral and central levels with the results of sensitization. After sensitization occurs, stimuli which under normal conditions do not cause pain, are perceived as pain (allodynia) and an excessive response to the stimulus that causes pain (hyperalgesia).[11]

Surgery causes trauma to the tissue, which results in dangerous stimuli and large nociceptive input. Then, after surgery there is an inflammatory process in the operating area, which is also responsible for dangerous inputs. Both of these processes sensitize the pain pathway. Both occur at the peripheral level where there is a decreasing in afferent nocioceptive threshold and at the central level by increasing excitation of spinal neurons involved in pain transmission. Peripheral sensitivity can occur with different stimuli such as temperature, tactile, mechanics, and chemistry. In clinical situations, this dangerous stimulation prolonged cause tissue damage and inflammation, and cause the releasing of substances from inflammatory mediators such as K, serotonin, bradykinin, substance P, histamine, etc. These substances act to sensitize nociceptors with high thresholds. As a low threshold stimulus, which usually does not cause pain, now, it is felt as pain. Central sensation occurs in surgical injuries through the dorsal mechanism where there is an increasing response to stimuli that are normally not painful and to the area surrounding the operation cause secondary hyperalgesia. This due to secondary C nerve fibers to primary afferents caused morphological and biochemical changes in the dorsal horn of the spinal cord which are difficult to return to normal. The changing that occur are an expansion in the size of the receptor diameter, as well as a big increase and duration of response to stimuli and finally there is a decreasing in the threshold. NMDA receptors (N-methyl-D-aspartic acid) can mediate responses in physiological process of sensory information, and are also involved in central sensitization.[11]

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CONCLUSION

In this study, there were more patients who complained of pain 24 hours postoperative compared to 1 hour postoperative. There was a significant difference between the level of pain at one hour postoperative and the 24-hour postoperative pain level. These differences can be influenced by individual patient factors such as gender, surgery history, and level of education as well as factors from medical personnel both in assessing and managing postoperative pain in patients. Patients on 24 hours postoperative, there may be peripheral or central sensitization due to delay or inadequate treatment of pain so that the pain was felt at 24 postoperative becomes higher. The lack of attention of medical personnel to postoperative pain had by patients can also be one of the main influential factors. There are also psycholpgic factors from patients who may feel afraid of medical personnel so they do not report their pain. After reading this research, it is expected that medical staff can be more attentive in carrying out assessment and management of postoperative pain. Future studies are expected to take samples over a longer period of time than this study. In addition, the variables studied for further research are expected to be more including variables related to paramedic performance.

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Conflict of Interest

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Original Article

DURATION OF VENTILATION SUPPORT USAGE AND DEVELOPMENT OF VENTILATOR-ASSOCIATED PNEUMONIA: WHEN IS THE MOST TIME AT RISK?

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ABSTRACT

Introduction: Ventilator Associated pneumonia (VAP) is pneumonia that occurs in patients who have been mechanically ventilated for a duration of more than 48 hours. The duration of ventilator use was identified as a risk factor which is trigger of VAP. **Objective:** This study aimed to determine the association between the duration of ventilator use and the incidence of VAP in patients in the Intensive Care Unit of Dr. Mohammad Hoesin General Hospital, Palembang. **Method and Material:** This study was an observational analytic study using cross sectional design. The samples were all patients who use a ventilator for more than 48 hours at the ICU room periode of July 1, 2014 to June 30, 2015. Data were obtained from patient's medical records of total 146 patients, but the number of patients who comply the criteria was 106 patients. **Result and Discussion:** Out of the 106 samples, 41 patients (38.7%) developed VAP and 65 patients (61.3%) did not develop VAP. The analysis using Chi Square test showed that patients who used ventilator for >5 days had an OR = 3.273 compared to patients using ventilator 2-5 days (p value = 0.016; 95% CI = 1.223 to 8.754). **Conclusion:** There is a significant association between the duration of ventilator use and the incidence of VAP in patients at the ICU of Dr. Mohammad Hoesin General Hospital, Palembang. Patients using ventilators for more than 5 days 3,386 times more at risk of developing VAP compared to patients using ventilators 2-5 days. The most risky time for patient using ventilator was more than 5 days of usage. And, the mortality rate of VAP patients was 63.4% from 41 patients while the mortality rate of whole ICU patients was 50.9%.

Keywords: Duration of Ventilator Use, Dr. Mohammad Hosein General Hospital, ICU's Patient, Ventilator, Ventilator Associated Pneumonia.

ABSTRAK

Pendahuluan: Ventilator Associated pneumonia (VAP) adalah pneumonia yang terjadi lebih dari 48 jam setelah pasien menggunakan bantuan alat ventilasi mekanik. Lama penggunaan ventilator diidentifikasi sebagai salah satu faktor risiko yang memicu terjadinya VAP. **Tujuan:** Penelitian ini bertujuan untuk mengetahui hubungan antara lama penggunaan ventilator dan kejadian VAP pada pasien di ICU RSUP Dr. Mohammad Hoesin Palembang. **Metode dan Bahan:** Penelitian ini merupakan penelitian observasional analitik dengan menggunakan rancangan cross sectional (potong lintang). Populasi penelitian adalah pasien yang menggunakan ventilator di ICU. Sampel penelitian adalah seluruh pasien yang menggunakan ventilator selama lebih dari 48 jam di ICU RSUP Dr. Mohammad Hoesin Palembang periode 1 Juli 2014 - 30 Juni 2015. Data pada penelitian ini diperoleh dari rekam medis pasien yang berjumlah 146 pasien, namun pasien yang memenuhi kriteria sebanyak 106 pasien. **Hasil dan Pembahadan:** Dari 106 sampel, didapatkan 41 pasien (38,7%) menderita VAP dan 65 pasien (61,3%) tidak menderita VAP. Hasil analisis menggunakan uji Chi Square menunjukkan bahwa pasien yang menggunakan ventilator selama >5 hari memiliki OR = 3,386 dibanding pasien yang menggunakan ventilator selama 2-5 hari (p value = 0,004; IK 95% = 1,452-7,893). **Kesimpulan:** Terdapat hubungan yang signifikan antara lama penggunaan ventilator dan kejadian VAP pada pasien di ICU RSUP Dr. Mohammad Hoesin Palembang. Pasien yang menggunakan ventilator selama >5 hari 3,386 kali lebih berisiko menderita VAP dibanding pasien yang menggunakan ventilator selama 2-5 hari sehingga dapat dikatakan bahwa waktu paling beresiko terkena VAP adalah pengunaan ventilator lebih dari 5 hari. Serta, angka kematian pada pasien VAP sebesar 63.4% sedangkan angka kematian total pada pasien ICU adalah sebesar 50.9%.

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Kata kunci: Lama Penggunaan Ventilator, RSUP Dr. Mohammad Hosein Palembang, Pasien ICU, Ventilator, Ventilator Associated Pneumonia.

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INTRODUCTION

Ventilator is a tool used to replace or support the respiratory function which is widely used for the treatment of patients in the Intensive Care Unit (ICU). The purpose of using ventilator is to protect the airway and prevent the occurrence of breathing failure.[1]

Patients in ICU who use the mechanical venting tools have high risk of suffering from nosocomial infections called ventilator associated pneumonia. This infection occurs because of patient who use the ventilators can be easily inhale the composite microorganisms of intestinal tract or upper respiratory tract to the lower respiratory tract, so inflammation of the pulmonary parenkim occurs.[2]

Ventilator Associated Pneumonia (VAP) is part of the nosocomial infections, defined as pneumonia that occurs more than 48 hours

after the use of a ventilator with intubasi endotrakeal or tracheostomy installation. VAP divided into early onset which occured in 2-5 the first day of the use of mechanical ventilation and late onset which occurred more than 5 days after the use of mechanical ventilation.[3,14]

VAP is the most occurence nosocomial infection and has a high number of morbidity and mortality in ICU's patients. Based on United States research, VAP occurs at 9.3% of sufferers that are using mechanical venting more than 24 hours. Research in Europe concluded that mechanical ventilation may increase the risk of pneumonia 3 times higher than the patients who did not use mechanical ventilation, while the Americas reported 24 times higher.[4,15]

Table 1. *Clinical Pulmonary Infection Score* (CPIS)

Parameter		Score
Temperature (°C)	≥36.5 and≤38.4	0
	≥38.5 and≤38.9	1
	≥39 or≤36	2
Blood Leukocyte (mm^3)	≥4000 and≤11,000	0
	<4000 or>11000	1
	+ Band forms≥50%	2
Tracheal Secretion	No tracheal secretions	0
	Nonpurulent tracheal secretions	1
	Purulent tracheal secretions	2
Oxygenation: PaO_2/ FiO_2 (mm Hg)	>240 or ARDS	0
	≤240 and no ARDS	2
Pulmonary Radiograph	No infiltrate	0
	Diffuse (or patchy) infiltrate	1
	Localized infiltrate	2
Progression of Pulmonary Infiltrate	No radiographic progression	0
	Radiographic progression (after cardiac failure and ARDS excluded)	2
Culture of Tracheal Aspirate	Pathogenic bacteria present rarely or in light quantity	0
	Pathogenic bacteria present in moderate or heavy quantity	1
	Same pathogenic bacteria seen with Gram's stain	2

VAP caused by non-Multi Drug Resistance (MDR) pathogens such *as s. pneumoniae, h. Influenzae, Methicillin Sensitive Staphylococcus aureus* (MSSA) or *Pseudomonas aeruginosa* such as MDR germ, Escherichia *coli, Klebsiella pneumoniae, Acinetobacter spp* and also Gram positive such as *Methicillin Resistance Staphylococcus aureus* (MRSA). Nosocomial pneumonia

which caused by fungi, anaerobic germs and viruses are rarely occurs.[5]

Suspected risk factors trigger the occurrence of VAP, such as: gender, age, patient's oral hygiene, patient's body position on his back, disease severity degree, decrease of consciousness, the use of endotracheal tube, the use of previous antibiotics, surgery, and long using of ventilator.[6,16,17,18]

VAP is difficult to definitively diagnosed and difficult to distinguish with the the other breathing failure's causes such as *Acute Respiratory Distress Syndrome* (ARDS) and pulmonary edema. Therefore, to distinguish the VAP with other pulmonary disease can be identified with *Clinical Pulmonary Infection Score* (CPIS). If CPIS score > 6 is considered as VAP.[7]

The objective of this study is to define the duration of of ventilator usage that has the most frequent incidence of VAP in Dr. Mohammad Hosein General Hospital, Palembang, Because there is still different result between Cook et al and Putri D.Y research.

MATERIAL AND METHOD

This study was observasional analytic research with cross sectional design. The sample were all of patients who use ventilator more than 48 hours in GICU of Dr. Mohammad Husein General Hospital, Palembang from July 1st 2014 to June 30th 2015 and have to comply with the inclusion characteristics. Data collected from patient's medical records such as age, gender, disease diagnosis, record of VAP, duration of ventilator usage and the frequency of patient's mortality when they out from ICU. After the data have been collected, then it would be analyzed with *Chi Square test*.

RESULT AND DISCUSSION

The number of samples was 106 from 146 patient's medical record data that have been collected. Meanwhile the other 40 couldn't be use as sample because it didn't comply the criteria for inclusion. Sample characteristic on this research can be seen in the table 2.

The relation between duration of ventilator usage and occurence of VAP

Table 2. Characteristics of Research Subject (n=106)

Characteristics of Research Subject	Frequency (n)	Persentage (%)
Gender		
Male	50	47.2
Female	56	52,8
Total	106	100
Diagnosis group		
Pasca surgery	60	56.6
Non surgery	46	43.4
Total	106	100
Occurance of VAP		
Positive	41	38.7
Negative	65	61.3
Total	106	100
Duration of Ventilator Use		
>5 days	59	55.7
2-5 days	47	44.3
Total	106	100
Frequency of Deaths		
Death	54	50.9
Cure	52	49.1
Total	106	100

The average age of patients who use ventilators was 41.62 ± 17.54 years old. Out of 106 total of patients suffering from VAP, 8 patients or 19.5% suffered from early onset VAP and 33 patients or 80.5% suffered from late-onset VAP type.

The average duration of patients ventilator usage in ICU was 17 (2-71) days. The average duration of ventilator usage of patients who positively suffered the VAP was 8 (2-45) days while the average duration of ventilator usage in patients of non VAP was 5 (2-71) days.

Table 3. Days of Patient in ICU based on VAP(+) and VAP(-)

Days of Patient in ICU	∑ VAP (+)	%	∑ VAP (-)	%	TOTAL
2	3	33.33	6	66.67	9
3	3	30	7	70	10
4	1	14.29	6	85.71	7
5	0	0	7	100	7
6	2	25	6	75	8
7	6	46.15	7	53.85	13
8	1	25	3	75	4
9	0	0	3	100	3
10	3	60	2	40	5
11	1	25	3	75	4
12	1	50	1	50	2
13	3	60	2	40	5
14	4	100	0	0	4
15	0	0	3	100	3
16	1	50	1	50	2
17	4	80	1	20	5
18	1	50	1	50	2
19	1	33.33	2	66.67	3
21	1	100	0	0	1
22	1	100	0	0	1
23	2	100	0	0	2
24	0	0	2	100	2
29	1	100	0	0	1
30	0	0	1	100	1
45	1	100	0	0	1
71	0	0	1	100	1

Table 3 showed the days of patients in ICU room based on the VAP (+) and VAP (-). The data analyzed with *chi square test* to define the cut off point of the most riskable days of using the ventilator. The result obtained that the most riskable days of using the ventilator was more than 5 days usage. Based on the table 4, the patients who use ventilators more than 5 days have 3.386 of OR than patients who use ventilators 2-5 days with *p* value = 0.004 and IK 95% = 1.452-7.893.

Based on the results obtained a difference of VAP sufferers number among patients who the ventilator 2-5 days and > 5 days. The analitycal results of Chi Square test shows that long usage of ventilator significantly related with VAP insident of ICU's patients in Dr. Mohammad Hoesin General Hospital, Palembang. Patients who use ventilator more than 5 days have OR = 3.386 than the patients who use ventilator for 2-5 days with p value = 0.004 and IK 95% = 1.452-7.893. It means that patients who use ventilator for more than 5 days have 3.386 times higher risk of suffering from VAP than patients who use ventilators for 2-5 days.

Table 4. Bivariate Analysis of Ventilator Usage Duration and Occurance of VAP (n=106)

Ventilator Usage Duration	Occurance of VAP		Total (n)	OR
	VAP +	VAP -		
>5 days	30	29	59	3.386
2-5 days	11	36	47	
Total	41	65	106	
P value			0.004	
IK 95%			1.452-7.893	

Cook, *et al* stated in their research that there is a significant relationship between the long usage of the ventilator with the occurance of VAP, where the VAP incidence increases according to the long usage of mechanical ventilators. According to Cook *et al*, the estimated increase of VAP insidence is 3% per day for the first 5 days of ventilator usage, 2% per day during the 6th-10th day, And then 13% per day after the day 10 of ventilator usage.

Result of this reseach compared with another research in Indonesia. Putri's research stated that there is no significant relationship between the long usage of ventilator with the the occurance of VAP in ICU's patients.[8]This differences probably occured due to VAP is not only influenced by the long usage of ventilator but it can be influenced by other risk factors such as patient's oral hygiene, the body position on their backdisease severity degree, decreased of consciousness, the use of *stress ulcer prophylaxis*, and the use of *nasogastric tube*.[3] The both research did not control the other risk factors so a difference might be occured.

The duration of mechanical ventilator usage affect the VAP incidence. In a healthy individual, the respiratory tract is sterile and

has a variety of defence mechanisms against infections such as the glottis and laryngeal, cough reflex, trakeobronkial secretion, mukosilier motion, humoral immunity and cellular, and Phagocytic system to prevent the occurrence of microbial invasion into pulmonary parenkim. Saliva has an important role in regulating the composition of normal flora inside the mouth. The use of mechanical ventilation with endotrakeal intubasion may cause the respiratotry tract's defense disturbed, so the pathogenic microorganisms can be easily composited on the respiratory tract and then invade the parenkim. The longer duration of mechanical ventilation usage will cause the more composite bactery in respiratory tract. On the other hand, the defense of respiratory tract is not in a good condition and it keeps open during the intubasion, then the incidence of VAP increase along with the long ventilator usage.[10]

Kollef stated that VAP incidence depend on the environmental exposure duration and duration of the health tools usage.[10] Several studies had identified that the duration of ventilator usage is one of the important risk factors that triggers the VAP. Patients who use mechanical ventilation would having an improvement of VAP insidence along with the duration of ventilation and is not constantly during the ventilator usage. The highest risk of VAP occurred on the early hospital treatment. The decrease of ventilator usage duration could lower the risk of VAP, especially if the decrease of duration was conducting at the first and second week.[12,18]

The relation between the incidence of VAP and frequency of death

In this study, the VAP patients had 62.5% of mortality rate, while the non VAP patients had 47.9% of mortality rate. Safdar, *et al* stated that patients suffered from VAP has twice more risky to die than the patient who did not suffer the VAP.[12]

The deaths which caused by VAP was actually difficult to quantify because it was affected by many factors such as the patient's first diagnosis, disease severity degree, and great influence of organisms that cause VAP. Meanwhile, the VAP has a significant relation with the death (OR = 1.94; IK 95% = 1.24-3.03).[13]

CONCLUSION

Based on the result about the relation between ventilator usage duration and VAP occurance of ICU's patient in Dr. Mohammad Hosein General Hospital, Palembang, the conclusion was there is 41 (37.8%) patients who suffer VAP of 106 patients who use the ventilator. The average duration of ventilator usage in ICU of Dr. Mohammad Hosein General Hospital, Palembang was 7 (2-71) days with the average of ventilator usage duration of VAP patients was 8 (2-45) days and the average of ventilator usage duration of non VAP patients was 5 (2-71) days. Therefore, The duration of ventilator usage significantly affects to incidence of VAP in patients in the ICU of Dr. Mohammad Hoesin General Hospital, Palembang. The most affected duration was ventilator usage for more than 5 days.

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Conflict of Interest

There is no conflict of interest and funding in the writing of this article.

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