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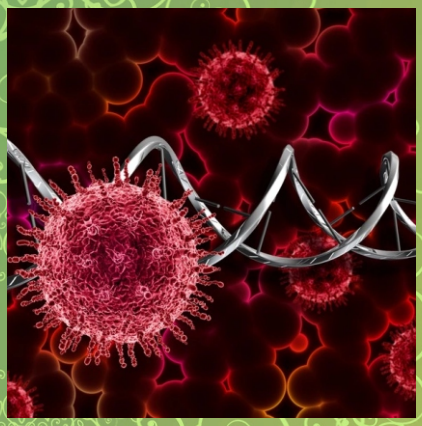

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Islamic Principles in Mental Medicine

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ABSTRACT

Background: The religion of monotheism is the religious instinct of every human being as a creature created by Allah SWT. One of the mental health therapies is religion. Islam is the prevailing religion in almost 56 nations around the globe and has more than 1.2 billion adherents. Islam speaks to an all-encompassing way of life and agrees with its supporters' expansive extent. The development of mental medicine in Islam has several reviews. Many Islamic figures contributed to treating mental illness long before Western figures discovered it. At the time of the Prophet Muhammad SAW, there was also a treatment for mental illness based on the Al-Quran. This article will mention several forms of worship as psychotherapy. **Objective**: The purpose of this article is to determine the role of the Islamic Principle in Mental Medicine. **Methods**: The design of this research is a literature review or library review, which is a systematic, direct, and reproducible research method by identifying, evaluating, and synthesizing published research. **Result**: Islamic principles in mental medicine consist of tawheed religion as mental therapy, worship as human psychotherapy, and Islamic psychotherapy to help psychiatric treatment and healing process. **Conclusion**: There are five ways of prayer that a Muslim can do as psychological therapy, namely: Saalat, Dhzikr, reading the Al-Quran, Shaum, and Hajj. In an Islamic intellectual, there is a discipline of Islamic Psychotherapy that is an integral part of Islamic Psychotherapy; such as *istinbath*, *iqtibas*, and *istiqro*.

Introduction

Previous research has shown that belief in a certain spiritual value helped patients to deal with complications of chronic illness (Algristian *et al*, 2017). The research did not specifically discuss what the patient's religion was and the spiritual value in question was not limited to one particular religion. Since the majority of patients were Muslim, this study aims to dig deeper into the principles of Islam as a religion for mental medicine.

Islam is the religion of monotheism, while monotheism is the instinct of every human being as a creature created by Allah SWT. One of the mental health therapies is religion. Islam is the prevailing religion in almost 56 nations around the globe and has more than 1.2 billion adherents. Islam speaks to an all-encompassing way of life

and agrees with its supporters' expansive extent (Tzeferakos and Douzenis, 2017).

The knowledge of Islam has been explained in the Al-Quran, which explains happiness and serenity. Research on religion seems to be divided on the issue of mental health effects, as some studies show that religion has an adverse impact n mental health. At the same time, some say that it leaves a positive impact. (Khawaja, 2019).

The development of mental medicine in Islam has several reviews. Many Islamic figures contributed to treating mental illness long before Western figures discovered it. At the time of the Prophet Muhammad SAW, there was also a treatment for mental illness based on the Al-Quran. This article will discuss several religious activities (or *ibadah*, mentioned later as “worship”) as psychotherapy.

Methods

This research design is a literature review or library review, which is a systematic, direct, and reproducible research method that identifies, evaluates, and synthesizes published research. In this study, the authors searched for literature with the keywords "Islamic principle, mental medicine" to obtain literature sources from journal database websites, including PubMed, Science Direct, and Google Scholar, and supported by various sources such as textbooks and other literature.

Result and Discussion

A. Islamic Principles in Mental Medicine

1. Tawheed (Tauhid) Religion as Mental Therapy

The religion of monotheism is the religious instinct of every human being as a creature created by Allah SWT. In (QS. Ar-Ruum 30:30), it means, "So be steadfast in faith in all uprightness 'O Prophet'- the natural way of Allah which He has instilled in 'all' people. Let there be no change in this creation of Allah. That is the straight way, but most people do not know". Based on this quote, it is explained that humans created by Allah SWT have instincts or impulses for religion, namely Islam as the religion of monotheism. Therefore, if a human being is not monotheistic, it is due to the influence of the environment because this is unnatural.

Tawheed, or believing in one God, offers a simple yet profound belief, representing one's private feelings towards one God. The simplicity of this belief helps humans who by nature do experience many problems in their lives. Modern man, as reviewed by Hussain (2017), is currently trying to adapt to many problems, of course, requires a simple belief in God Almighty. The

depth of belief that God is omniscient and sovereign over all things offers intimacy and dependence between a servant and his Lord. This simple and deep belief is what creates a "secure attachment" between himself and his God, thus helping humans to face problems in their lives (Sabry and Vohra, 2013).

One of the mental health therapies is religion. The knowledge of Islam has been explained in the Al-Quran, which explains happiness and serenity. The verse QS. An-Nahl 16:97 means, "Whoever does righteousness, whether male or female, while he is a believer- We will surely cause him to live a good life, and we will surely give them their reward (in the hereafter) according to the best of what they used to do." The meaning contained in the quote of the verse is that anyone who does good deeds must be accompanied by faith, and both men and women will get a commensurate reward, depending on the good deeds done. Moreover, as mentioned in (QS. Ar-Ra'ad 13:28), it means, "Those who have believed and whose hearts are assured by the remembrance of Allah. Unquestionably, by the remembrance of Allah, hearts are assured" (Ariadi, 2013).

In the holy book of the Al-Quran, there are instructions for humankind which is a sedative for the soul or healing for various kinds of heart disease (spiritual) contained in a human being. In (QS. Yunus ayat 57), it means, "O mankind; there has come to you instruction from your Lord and healing for what is in the breasts and guidance and mercy for the believers." These quotes provide instructions for us to be required to have good relations with Allah SWT and other people and be kind to nature and the environment. To treat the soul and prevent and foster mental conditions that exist in humans, Islam has a crucial role in the life of every human being. Through the appreciation and practice of the teachings of Islam, humans can find peace, prosperity, and happiness. Whether both in this world and in life in the hereafter. (Notosoedirdjo. 2002)

2. Worship as Human Psychotherapy

Several forms of worship as psychotherapy and their psychological effects are described.

a. *Saalat.*

Following Muslim teachings, the legal conditions for salat are valid if the Muslim has performed or is in a state of ablution (pure). The nature of our ablution is obliged to use holy water and can purify the body like the water we use to clean the body or for

daily activities, which is flowing, clear and refreshing. If we use water with the properties described, physically and psychologically, the attached dirt will also flow (disappear) following the water flow when used for ablution. Water can also be used as therapy with water media called therapeutic media. Rafi'udin and Zainudin (2004) explain that ablution not only has a psychological impact on a person but can also have a physiological impact because it can relieve physical and psychological tension in the body's organs. Because we wash body parts five times a day, it can be added. The word 'salat' etymologically means to pray for something good. Salat has a good impact on a person in healing the feelings of upset and sadness that occur in a human being (Najati, 2004). When salat, we must do it by perfecting ablution, saying the intention sincerely, praying *tuma'ninah* (quiet for a moment), not moving too fast or not in a hurry, and understanding the reading of the salat. Salaat will be able to have a positive effect on our bodies by praying solemnly; our souls will be calm and make prayer (salat) therapy for one's soul. With another intention, the soul becomes peaceful and calm when praying as the teachings of the Prophet Muhammad SAW. By salat, a human personality can be arranged, respond to things calmly and directed, and make people not immediately give up in the face of trials.

b. *Dhikr* (Dzikir).

In (QS. Ar-Ra'ad ayat 28), "Those who have believed and whose hearts are assured by the remembrance of Allah. Unquestionably, by the remembrance of Allah hearts are assured". From these quotes, we highly recommend doing dhikr because it will make our hearts calm and peaceful for His faithful servants. Moreover, in the words of the Prophet Muhammad, "It is not a group that sits in remembrance, but angels will surround them. They get an abundance of grace and attain serenity. And Allah will remember them from someone who is accepted by Him" (HR. Muslim and Tirmidzi).

c. Reading Al-Quran.

Treatment using the Al-Quran (spiritual medicine), the main office of that treatment, has been opened in several places. This treatment is known as *ruqyah* shariah. In the community, *ruqyah* is considered an alternative treatment or therapy for someone's healing, usually if the

disease is caused by an evil spirit or jinn contained in humans. However, this paradigm is incorrect in understanding the Al-Quran as a guide for humankind. Al-Quran is the holy *kalamullah*, which Allah SWT revealed to the Prophet Muhammad SAW as a guide for humans in distinguishing between right (*haq*) and wrong (*bathil*). If someone reads the Al-Quran and each verse, it can lead the soul always to be sincere in charity and *tawadhu* when responding to something by the teachings contained in the Al-Quran.

It is known that reciting the Al-Quran in a low voice induces a feeling of calm, whereas a loud voice increases agitation (Algristian *et al*, 2022). This research was conducted on mice, but it can be understood that by nature humans are also more comfortable listening to the soft chanting of the Al-Quran, not loud and screaming ones. Other studies have also proven that gentle recitation of the Al-Quran can increase an individual's immune response (Muhammad *et al*, 2022).

d. *Shaum* (Fasting)

Najati (2004) explained that *shaum* (fasting) is an activity that can bring many benefits, including strengthening oneself from all temptations and improving the human soul in terms of controlling lust in humans. Shaum is a means to train oneself to control motivation or emotional impulses and to control lust and lust. Unmarried youths are highly recommended by the Prophet Muhammad to carry out fasting to control their lusts and avoid adultery. During fasting, one will also feel the same suffering as those experienced people who are less able to meet their daily needs. Fasting is what can encourage us to help fellow human beings, especially the poor. Najati (2004) stated that this sensitive feeling and attitude could foster the spaciousness of the soul and a sense of peace.

e. *Hajj*.

The story of the Prophet Ibrahim is the beginning of the Hajj itself. The meaning of the story taken is the sacrifice of the things that are most loved and owned and also the struggle for one goal, namely to get the pleasure of Allah SWT. In addition, someone who performs the Hajj not only prioritizes his struggle but is also accompanied by *tawakkal*, a sacrifice of all graces, and poured out love for Allah SWT. Hajj can also train in controlling human patience. At the time of Hajj, the position of all

Muslims is the same and will not be judged by position and rank. That also causes us to do therapy when performing the Hajj, namely therapy for arrogance, conceit, and pride. According to Najati (2004), the atmosphere of the Hajj contains a lot of spiritual values that can increase the spirit to achieve peace because a person performing Hajj asks forgiveness from the Almighty and adds an atmosphere of divine chanting that thunders full. A Muslim who performs the Hajj can make improvements or self-introspection (*muhasabah*) to find identity as a servant. The essence of a Muslim is to devote himself and his life in this world only to Allah SWT. Arifin (2008) Explains that sincere devotion can invite an outpouring of grace and pleasure from Allah SWT. As a creature created by Allah, the human soul becomes calm and holy.

3. Islamic Psychotherapy to Help Psychiatric Treatment and Healing Process

In the Islamic intellectual world *Thiburrohmany*, it can be known as a discipline of Islamic Psychotherapy which is an integral part of Islamic Psychotherapy. The previous reviews mentioned that patients with mental illness who have a strong acknowledgment of religious and spiritual beliefs likely use the positive appraisal to deal with their obstacles (Al Hajiri *et al*, 2021).

Islamic psychotherapy, which is explained in the instructions in the Al-Quran, is the science of the process of treating and healing mental illnesses and mental disorders in a person through a psychological intervention based on the Al-Quran and Sunnah. The regularity of a methodology is constructed in one way, including: (1) *istinbath*, (2) *iqtibas*, and (3) *istiqro*. First, *istinbath* is a reasoning process based on theories from the Al-Quran and Sunnah for Psychotherapy. Second, *Iqtibas* is a process of reasoning through the theory of the results of ijtihad, which experts have confirmed regarding psychotherapy that is not different from or following the teachings of the holy book Al-Quran and Sunnah. Third, *istiqro* is a reasoning process based on research results and empirical and spiritual experiences related to psychotherapy. Based on the three paths described previously, several methods and techniques in Islamic psychotherapy were found to assist the nursing process and the treatment or healing of mental illnesses, namely: (1) *Dhikr*, (2) *Tashowuf-Thoriqot*, (3) Fasting (*shaum*), (4) *Salat*, (5) Repentance bath, (6) Prayer, and finally, *Hikmah* (which can be distinguished from

shamanism/occult practices or *kuhanah*). (Arifin.2008)

B. Development of Mental Medicine in Islam

The development of mental medicine in Islam has several reviews. Many Islamic figures contributed to treating mental illness long before Western figures discovered it. At the time of the Prophet Muhammad SAW, there was also a treatment for mental illness based on the Al-Quran.

Abu Zayd Ahmed ibn Sahl al-Balkhi (850-934) is a doctor from Persia who first introduced *'Al-Tibb Al-Ruhani'* or the concept of mental health in Islamic medicine. He developed principles of Islamic psychotherapy to cure people with mental disorders, as he wrote in the 9th century entitled the book *'Firdous al-Hikmah'*.

Besides Abu Zayd Ahmed ibn Sahl al-Balkhi, other Muslim thinkers, Al-Farabi, also contributed their thoughts for treatment related to mental illness. Al-Farabi wrote treatises on social psychology and those related to the study of consciousness. Ibn Zuhr (Avenzoar) also accurately revealed diseases related to nerves. He also made vital contributions to modern neuropharmacology.

There is another history of the development of mental medicine called the development of the holistic ecliptic approach. This approach can be interpreted as a comprehensive and detailed approach and was first expressed by Prof. Kusumanto, which Prof. Dadang Hawari then modified, and then by Prof. Sasanto Wibisono. The soul is based on a new integrative paradigm based on process theory: Biological Priority and Psychological Supremacy. These developments include (1) organo-biological, (2) psychological, (3) socio-cultural, and (4) spiritual and religious in the late 1900s and early 2000s.

Conclusion

There are five ways of prayer that a Muslim can do as psychological therapy: Saalat, Dhzikr, reading the Al-Quran, Shaum, and Hajj. In an Islamic intellectual, there is a discipline of Islamic Psychotherapy that is an integral part of Islamic Psychotherapy; Istinbath, Iqtibas, and Istiqro.

Not only that, but several Muslim scholars also put forward the concept of mental health; Abu Zayd Ahmed ibn Sahl al-Balkhi, Al-Farabi, who wrote treatises on social psychology, and Ibn Zuhr, who managed to reveal diseases related to nerves

and also make a substantial contribution on modern neuropharmacology.

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Risk Factor of Low-Birth-Weight Baby Prevalence at Fakfak Public Hospital West Papua

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ABSTRACT

Background: The high number of infant mortality rate in Indonesia relate to Low Birth Weight (LBW) babies that be a problem of public health sector. LBW babies are facing several health problems such as various diseases that arise in the first six days of life, and can experience long-term problems such as impaired development and growth. This is inseparable from the mother's risk factors during pregnancy. West Papua Province contributes 23.8% of LBW cases in Indonesia. Fakfak District Hospital as the only referral hospital in West Papua Fakfak district still has many problems related to cases of low birth weight babies.
Objective: To know the risk factors of LBW prevalence based on maternal age, gestational age, parity, hemoglobin levels, premature rupture of membranes (PROM), and preeclampsia in Fakfak public hospital, West Papua.
Methods : This study is an observational analytic with cross sectional study in Fakfak public hospital during April 2021 till October 2021. Purposive sampling method used to obtain the samples from medical records that fit to inclusion and exclusion criteria (N=418). Data was analyzed with SPSS statistic for Mac used Chi-square test and logistic regression method. The significant level of the test was $p < 0,05$.
Results: A total of 418 newborn were included during study period. There were significant results in gestasional age (*p=0,000*) (OR 7,23, CI95% 1,13-10,4), premature rupture of membranes (PROM) *p=0,000* (*p<0,05*) OR 14,23 (CI95% 7,7-26,2), hemoglobin levels (p=0,000) (OR 3,47 CI95% 1,99-6,03), preeclampsia (*p=0,000*) (OR 9,76 CI95% 5,39-17,6). The regression test showed significant result at four variables.
Conclusion : Gestational age, PROM, hemoglobin levels, and preeclampsia are risk factors that significant lead to LBW prevalence in Fakfak public hospital, West Papua.

Introduction

The low number of infant mortality rate (IMR) is an indicator of public health improvising (De Onis, *et al.*, 2019). According to the World Health Organization (WHO), newborns with birth weight less than 2,500 grams (LBW) have a risk of death twenty-times higher than the normal birth weight. As many as 34% of neonatal deaths are caused by conditions of

LBW. WHO estimates that globally from 20 million births, there are about 15% to 20% of newborns with LBW each year (WHO, 2014).

Birth weight has an essential impact on the growth and development process in newborns. In LBW babies, the lungs are imature and immunodeficiency that lead to several illness such as infections and even a death (Hartiningrum and Fitriyah, 2018). Several factors that relate to LBW are maternal, fetal, and environmental factors. Maternal factors include maternal age below twenty years and above thirty five years, as well as pregnancy complications such as anemia, antepartum bleeding, hypertension, preeclampsia, PROM, low socioeconomic conditions, and deficient nutritional status. Fetal factors include chromosomal abnormalities, Intra uterine growth restriction (IUGR), and environmental factors such as radiation and exposure to toxic substances (WHO, 2014).

Based on data, The five-highest provinces of LBW are Papua (27%), West Papua (23.8%), East Nusa Tenggara (20.3%), South Sumatra (19.5%) and West Kalimantan (16.6%) (Riskesdas, 2015). Fakfak public hospital, that is the only referral hospital in Fakfak Regency, has many problems related to LBW cases. It is interesting to distinguish the factor of LBW in newborns baby who cared at Fakfak public hospital, West Papua.

Methods

This study is an analytical observational study using cross sectional research design to determine the risk factors of LBW prevalence in Fakfak public hospital-West Papua during April 2021 until October 2021. The population of this study were all live newborns with LBW that meet the inclusion and exclusion criteria. Sampling in this study using purposive sampling method according to research criteria. The independent variables in this study were maternal age, gestational age, parity, PROM, hemoglobin levels, and preeclampsia. The dependent variable was the prevalence of LBW. Data analyzed using SPSS, with Chi-square test method and logistic regression where $p<0.05$ showed a significant difference.

Result and Discussion

The total sample were 418 (LBW 50%;n=209) (normal birth weight-NBW 50%; n=209). The data was extracted to the characteristic of respondents, Chi-square analysis and multivariate test. Subject characteristics are described in table 1.

Table 1. The characteristic of LBW risk factor.

Characteristic	LBW (n=209)	NBW (n=209)
Maternal age		
< 20 or > 35 years	103 (52,9%)	92 (47,1%)
20-35 years	106 (47%)	96 (43%)
Gestational age		
< 37 weeks	125 (69,8%)	54 (30,2%)
37-42 weeks	83 (34,9)	155 (65,1%)
> 42 weeks	1 (100%)	0 (0%)
Parity		
>3	93 (48,1%)	100 (51,9%)
<3	116 (51,6%)	109 (48,4%)
PROM		
Yes	146 (78,5%)	40 (21,5%)
No	63 (27,2%)	169 (72,8%)
Hemoglobin levels		
Anemia	130 (68,1%)	61 (31,9%)
No anemia	79 (34,8%)	148 (65,2%)
Preeclampsia		
Yes	142 (76%)	45 (24%)
No	67 (29%)	164 (70,1%)

Bivariat *Chi square* analysis showed that four of six variables resulted significance risk of LBW in gestational age (OR 2,76; 95%CI 1,54 – 8,93; *p=0,000*), hemoglobin levels (OR 3,99; 95%CI 2,65 – 6,09; *p=0,000*), PROM (OR 7,79; 95%CI 6,21 – 15,41; *p*=0,004) and preeclampsia (OR 7,72; 95%CI 4,97 – 11,98; *p=0,000*).

Table 2. Risk factors of LBW

Variable	n (%)	Odds Ratio (OR)	CI 95%	P
Gestational age				
< 37 weeks	125 (59,8)			
37 – 42 weeks	83 (39,7)	2,76	1,54 – 8,93	0.000
>42 weeks	1 (0,5)			
Maternal age				
< 20 or ≥ 35 years	103 (49,3)	-		0.281
20 till < 35 years	106 (50,7)			
Parity				
>4	93 (44,5)	-		0.492
≤4	116 (55,5)			
Hemoglobin levels				
Anemia	130 (62,2)	3.99	2,65 – 6,09	0.000
No anemia	79 (37,8)			
PROM				
Yes	146 (69,9)	9,79	6,21 – 15,41	0.004
No	63(30,1)			
Preeclampsia				
Yes	142 (68)	7,72	4,97 – 11,98	0.000
No	67 (32)			

From logistic regression analysis obtained four significance variables, they are maternal age (OR 7,234; 95%CI 1,13 – 10,40; *p=0,000*), hemoglobin levels (OR 3,471; 95%CI 1,99 – 6,04; *p=0,000*), premature rupture of membranes (OR 14,296; 95%CI 7,78 – 26,28; *p=0,000*) and preeclampsia (OR 9,762; 95%CI 5,39 – 17,66; *p=0,000*) (table 3).

Table 3. Multivariate analysis of LBW risk factor

Risk factors	Exp(B)	CI 95%	P
Maternal age	7.234	1.13 – 10.40	0.000
Hemoglobin levels (Hb)	3.471	1.99 – 6.04	0.000
PROM	14.296	7.78 – 26.28	0.000
Preeclampsia	9.762	5.39 – 17.66	0.000

Discussion

This study showed that gestational age was a significant risk for the LBW prevalence. Delivery before 37 weeks of gestation in Ghana is one of the predictors of LBW (WHO, 2014). Gestational age is an important role in determining birth weight. WHO estimates that about one third of LBW in the world is caused by premature delivery (Adam, *et al.,* 2019). It is clear that preterm newborns, either due to gynecological or medical factors, have higher risk of being born with LBW, because growth below 37 weeks of gestation has not yet reached the optimal growth and development (Riskesdas, 2015; Aboye W, *et al.,* 2018).

Maternal age has no significant risk of of LBW prevalence. These results are in line with a study stated that there was no significant result between maternal age and LBW prevalence (Elisa and Andriana, 2019). The distribution of LBW based on maternal age showed that the age of mothers between twenty years till below thirty-five years who are not at risk but gives birth to LBW (48%). Maternal age below twenty years and above thirty-five years were not at risk for the LBW prevalence, contrary in this study the result obtained for maternal age below twenty years or above thirty-five years were 52%. Women at the risky age (<20 years and >35 years) should remain avoided to have a pregnancy, because the optimal age for a mother to give birth is at the age of twenty till below thirty-five years old. Pregnancy at the age of teenagers below twenty years has an impact to growth failure because they have several risks such as frequent anemia, impaired fetal growth and development, miscarriage, prematurity or low birth weight, birth disorders, preeclampsia. and antepartum haemorrhage. In addition, mothers who give birth at the age above thirty-five years are not recommended and

harmful, considering that women who are pregnant at the age above thirty-five years are one of the reason of pregnancy complications, especially the increase number of giving birth to babies with LBW (Manuaba, et al., 2010).

In this study, parity has no significant difference with LBW prevalence. It in line with a study of Permana, 2019 (*p value = 0,15*). This study results that LBW (birth weight below 2500 gr) from low parity (parity ≤4; n=116) has higher number than multiparity (parity >4; n=93). A study from Manuaba has contrary, stated that parity two until four has a secure pregnancy and delivery, however the primipara and multiparity than four are not secure because of the fibroid tissues as the result from previous pregnancy. The fibroid tissues caused a thrombosis to the placenta that make placenta adhesions. Placenta become thinner and wide invasions. This condition resulted the decrease of uterus vascular supply to the fetus (Sulistyawati, 2015).

The first maternal and delivery are probable to have LBW because the lack of the experience. During the pregnancy, relative anemia happened because the hemodilution that resulted from the increase number of relative plasma that has bigger volume than erythrocyte. Hemodilution is one of the physiology adaptations of maternal circulation to fulfilling uterus and fetus that have vascular hyperthrophy (Cunningham, et al., 2010). Hemoglobin normal is 12,5 g/dl, the hemodilution effect resulted the hemoglobin around 11 g/dl. If the number below 11 g/dl, it is an iron deficiency anemia (Prawirohardjo, 2016).

The results of this study showed that the examination of hemoglobin levels is a risk for the incidence of LBW. Based on the results of statistical tests, the OR value is 3.99, this indicates that the hemoglobin level examination is a risk factor for the incidence of LBW or in other words, mothers who do not regular examination of hemoglobin levels have a 3.99 times greater risk to give birth of LBW compared to mothers who do. Coverage of hemoglobin levels examination. This is because during antenatal care visits there are still many pregnant women who have not regular examination for hemoglobin levels so that hemoglobin levels are not properly controlled during pregnancy that can result in pregnant women experiencing anemia and having a high risk of LBW. Simple preventions of LBW are routine antenatal care visits and routine hemoglobin examination two times during pregnancy.

Pregnant women who suffer from anemia experience LBW by 3.1 times greater than women who are not anemic (Nur and Adhar, 2016). Anemia led to decrease oxygen supply to tissues, besides that it can also change the structure of the placental vascular, that will interfere with

fetal growth so that it will strengthen the risk of developing anemia. The occurrence of preterm labor and the birth of babies with LBW, especially for low hemoglobin levels starting from the early trimester of pregnancy.

PROM shows a significant risk factor for LBW prevalence. Similar to the results of Indriani, 2018, stated that mothers with PROM (n=203), experienced LBW in the delivery ($p < 0.05$) (Indriani, 2014). PROM will affect the weight of the baby being born which results in premature birth and the risk of giving birth to babies with pure prematurity that are included in the LBW category (Cunningham, et al., 2010). The rupture of the amniotic membrane is due to an imbalance between the synthesis and degradation of the extracellular matrix, transforms in cell structure and collagen catabolism. One of the complications of PROM is increase the risk of premature labor and LBW. The cause of PROM is not known for certain, but the possible predisposing factors are abnormal membranes infection, fetal position abnormalities, incompetent cervix, maternal age below 20 years or above 35 years, multigravidity or parity factors, previous history of PROM, excessive uterine tension, narrowing of the pelvis, maternal fatigue at work, as well as trauma obtained such as sexual intercourse, internal examination or amniocentesis (Prawirohardjo, 2016).

Preeclampsia shows a significant risk factor for the incidence of LBW. The results of the research according to the theory, there is vasoconstriction of blood vessels in the uterus in preeclampsia, which causes an increase in peripheral resistance, and leading to an increase in blood pressure. Vasoconstriction of blood vessels in the uterus can result the decreased blood flow so that the supply of oxygen and nutrients to the fetus is reduced. When this happens, it can implicate to the intrauterine growth restriction (IUGR) and give birth to the LBW (Backes, *et al.,* 2013). Another condition is explained by the failure of spiral arteries in the myometrium to maintain their musculoelastic structure, in addition to acute atherosclerosis in the spiral arteries which can cause arterial lumen. If the size gets smaller, this situation will induce placental infarction and lead to fetal hypoxia and fetal death (Castro, 2014).

In this study, preeclampsia has risk factor 7.72 times higher to generate LBW compared to non-preeclampsia. According to the study of Bacak (2017), preeclampsia increases the risk of IUGR and low birth weight due to decreased uteroplacental blood flow, and it will lead to LBW. Preeclampsia is a multisystemic disease characterized by hypertension that develops after twenty weeks of gestation that was

previously normal, accompanied by proteinuria or, if not present, accompanied by signs of organ injury (Cunningham, *et al.*, 2010).

The incidence of LBW is related to the handling of serious cases of preeclampsia and eclampsia requiring active action, called termination of pregnancy immediately regardless of gestational age and estimated fetal weight. Therefore, it is important to have health workers monitoring for maternal who have complications in prior pregnancy, so that they get early treatment then minimalize LBW prevalence (Mulyanti, 2014).

Socialization and early diagnosis in pregnancy at the primary health center are needed to decrease the risk factors that cause LBW so that maternal problems that arise can be detected earlier. Supports from obstetricians, pediatricians, and primary health center will minimize problems of pregnant women such as preeclampsia, anemia, preterm pregnancy, and PROM that can increase LBW prevalence.

Limitation of this study lies in the time of study. This study probably has better result with longer time, in order to get more samples to get more significant results in assessing risk factors that cause LBW.

Conclusion

Among several risk factors for LBW that showed significant results in this study were gestational age below 37 weeks, anemia, preeclampsia and PROM. The results of this study can be used as information material to determine the risk factors for the prevalence of LBW.

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Density of House Dust Mites (HDM) *Dermathopagoides* sp. In Jatimulya Village South Tambun District Bekasi City

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ABSTRACT

Background: House Dust Mites (HDM) are arthropods that trigger allergies such as asthma and rhinitis. The percentage of these animals as the cause of asthma according to WHO data (2013) is around 50% -80%.
Objective: The purpose of this study was to obtain new information about the density of HDM in the city of Bekasi as well as to complement the existing data so that it can be used as a reference in formulating an allergy prevention program caused by HDM.
Methods:This study was designedwith a quasi-experimental study research method using a comparative pre-test post-test non-equivalent control group design.The sample in this study was divided into two groups, namely one control group and one treatment group from the sample selected by purposive sampling. The population studied were students of the Hidayatullah Islamic Boarding School inSurabaya.
Result: This type of research is quantitative descriptive with a cross-sectional research design. The sample in this study were 9 houses of residents of the village of Jati Bulak, RT 001/ RW 003, Jatimulya Village, Tambun Selatan District. The location points for dust sampling for each house are mattresses, carpets and floors. The working procedure of this research includes the pre-analytic stage in the form of preparation of tools and materials, the analytical stage in the form of HDM examination with the sedimentation method, the post-analytic stage in the form of confirmation of HDM identification.
Conclusion:From research result that has been done, it can be concluded that the HDM figures in 9 houses of Jati Bulak villagers RT 001/ RW 003 Jatimulya Village, Tambun Selatan District are in the low category.

Introduction

HDM (House Dust Mite) is an animal belonging to the phylum Arthropoda, class Arachnida and order Acarina. TDR has 2 important species studied in the world of health, namely *Dermatophagoides pteronnyssinus* and *Dermatophagoides farina* (Hohakay *et al.*, 2017). Called House Dust Mites (HDM) because these animals have a habitat in carpet dust, mattresses, and other home furnishings that have never been cleaned (Batti *et al.*, 2013*)*.

HDM is considered to cause health problems because it triggers allergies such

as asthma and rhinitis (Majawati and Joselyn, 2019). According to WHO (2016) of the 235 million people in the world who suffer from asthma, around 50% -80% are caused by HDM, both *Dermatophagoides pteronyssinus* and *Dermatophagoides farina*. The prevalence of HDM is more commonly found in countries with tropical climates, one of which is Indonesia (Subaha *et al.,* 2016).

Seeing the problems and impacts caused by HDM, it is necessary to screen HDM in areas suspected of being the spread of HDM to update data regarding the incidence of HDM in Indonesia. As for several previous studies that underlie this research, among others, research by Walangare *et al*. (2013) in Manado City reported the existence of HDM type Acarus sp. as much as 36.66% in the bedroom and 35.18% in the living room; Ponggalunggu *et al.* (2015) who reported that the most common HDM species found in allergy sufferers were *Dermatophagoides pteronyssinus* on beds, bed floors, and sofas; Widiastawan *et al*., (2015) added data at the same location as Ponggalunggu *et al.* (2015) that the most common family found in Malalayang Manado was Pyroglyphidae with the highest HDM density level in bed dust samples and the lowest on the bedroom floor. Another study by Hohakay *et al.* (2017). ; Arrahmi *et al*. (2019) regarding the HDM density in Jati Village, Padang Timur District, Padang City reported that the overall HDM density reached 13.49 mites/g dust. The highest density found in the bed was 15.1 mites/g dust.

Various studies on the type and density of HDM have been carried out in several cities in Indonesia such as Manado, Padang, Palembang, Pekanbaru, and Jakarta. However, data on the density of HDM in Bekasi City has not been widely published, even though a complete update of data on HDM density in Bekasi City is needed as a basis for determining the incidence of HDM in Bekasi City. The location of this research was carried out in Jati Bulak Village, RW 001 RT 003, Jatimulya Village, Tambun Selatan District, Bekasi Regency. The purpose of this study was to obtain new information about the density of HDM in the city of Bekasi as well as to complement the existing data so that it can be used as a reference in compiling an allergy prevention program caused by HDM.

Methods

This type of research is descriptive quantitative to see the picture of HDM in Kampung Jati Bulak RT 003 Jatimulya Village, South Tambun District, Bekasi Regency. The design of this research is cross-sectional or each study subject is only made one observation. This research was conducted in February-May 2021 with the

sampling location in Jati Bulak, Bekasi City, while the HDM examination was carried out at the Parasitology Laboratory of DIII Technology Laboratory medis of STIKes Mitra Keluarga East Bekasi.

The sample in this study was dust obtained from beds, ventilation, and floors in 9 houses of Kampung Jati Bulak residents RT/RW 001/003 Jatimulya Village, South Tambun District. The variable in this study is an independent variable in the form of HDM density.

The tools used in this research include analytical balance, watch glass, spatula, object-glass, cover glass, test tube, plastic container, carpet, measuring pipette, bulb, beaker, stirring rod, measuring cup, dropper pipette, tube rack, microscope, vacuum cleaner (vacuum cleaner), mask, handscoon, label, and stationery. The materials to be used in this research are dust obtained from rented houses and residents' houses in Kampung Jati Bulak RT/RW 001/003 Kelurahan Jatimulya, Tambun Selatan District, saturated NaCl solution, and aquades.

The way the research works refers to the research of Widiastawan *et al*., (2015) which includes pre-analytic, analytical, and post-analytic stages. The pre-analytic stage includes dust samples taken on mattresses and carpets in 15 rented houses and houses in Jati Bulak Village RT/RW 001/003 Jatimulya Village, Tambun Selatan District using a vacuum cleaner. Dust samples were taken in 1 room and 1 bed in each rented house and resident's house. The vacuum cleaner filter should be replaced or cleaned, after the next object collection. The collected dust is put in an adhesive plastic container and labeled with the object number, date of collection, and object name written on it. The dust sample was taken to the Mitra Keluarga Stikes Laboratory.

The analytical step includes the dust sample being filtered and weighed on the analytical balance of as much as 0.1 grams. The sample was put into a test tube and added saturated NaCl then homogenized. Saturated NaCl is put into a test tube until it fills the tube. The cover glass was placed on the surface of the tube and left for 20 minutes. The cover glass is lifted and placed on the glass object and labeled with the respondent's name, preparation code, and date of manufacture. Then, the preparations were observed under a microscope. The post-analytic stage was carried out by identifying the presence of HDM using the 2013 medical parasitology manual and calculating the HDM density with the following formula.

$$\text{HDM Density} = \frac{Total\ dust\ weight\ (g)}{0{,}1} \text{ x Amount of HDM in 0,1 g dust}$$

Data analysis using descriptive analysis. This means that the data obtained

is described so that information is obtained in the form of a description of the HDM density in Jati Bulak Village RT/RW 001/003 Jatimulya Village, South Tambun District.

Results and Discussion

The identification of HDM in this study was carried out in Jati Bulak Village, RT 003 RW 001, Jatimulya Village, Tambun Selatan District, Bekasi Regency. The number of samples in this study was 27 dust samples taken from mattresses, floors, and carpets. A complete description of the subject, the location of the object, and the level of cleanliness of the house in Kampung Jati Bulak RT 003 RW 001 Bekasi Regency are shown in tables 1 and 2.

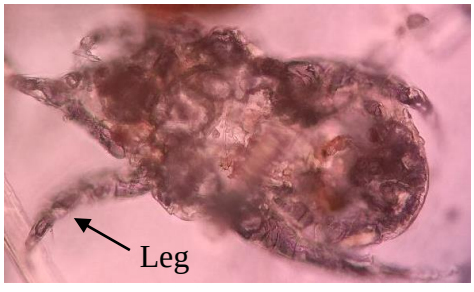
Table 1. Description of research subjects in Jati Bulak Village RT 003 RW 001 Jatimulya Village, Tambun Selatan District, Bekasi Regency

HDM	Allergy/asthma in householders	
	Allergy/asthma	No Allergy/asthma
Positive (+)	1	8
Negative (-)	0	9
Occupants of the house (persons)	Number of houses	Positive HDM
1-2	2	2
3-5	6	6
>5	1	1

Table 2. Description of the location of dust sampling in the homes of residents of Kampung Jati Bulak RT 003 RW 001 Village Jatimulya, South Tambun District, Bekasi Regency

Sampling location	Positive HDM	Negative HDM
Mattress	0	9
Carpet	9	0
Floor	0	9

The results shown in table 1 show that there is 1 HDM positive house with occupants with asthma, while table 2 shows that from the three sampling locations, namely mattresses, carpets, and floors, only carpets were tested positive for HDM. The results of the identification of HDM genus Dermatophagoides sp. on the carpet are shown in the image below



Picture . House Dust Mites, genus Dermathopagoides sp. at 400x magnification.

The results of the calculation of the TDR density on the carpet showed that the highest TDR density was 7.24 mites/gram dust, while the lowest was 4.37 mites/gram dust. The results of the calculation of the average TDR density found in dust samples on the carpet can be shown in table 3.

Table 3. The results of the average density of HDM on carpets in dust samples in Jati Bulak village RT 003 RT 001 Jatimulya Village, Tambun Selatan District, Bekasi Regency

Sample Number	Total Dust Weight (grams)	Total HDM	Mite Density /Gram Dust
1	0,5170	1	5,17
2	0,6850	1	6,85
3	0,4528	1	4,53
4	0,5589	1	5,59
5	0,4368	1	4,37
6	0,6046	1	6,05
7	0,5188	1	5,19
8	0,6962	1	6,96
9	0,7241	1	7,24

Based on the research conducted in Jati Bulak Village, RT 003 RW 001, Jatimulya Village, Tambun Selatan District, Bekasi Regency, it was found that the HDM genus Dermathopagoides sp. with the characteristics of being round and oval, cream and brown, appearing transparent, having setae, and legs. However, the morphology is not visible such as the number of legs, the presence of palps, and calicera. This is due to Dermathopagoides sp. visible with a 400x magnification microscope covered by a sample of house dust. The results of the identification of HDM morphology in this study are following the research of Kawulur *et al*. (2013) which states that the characteristics of HDM are having setae (hair), four pairs of legs, a body in the form of a pouch, measuring between 0.2-0.3 mm, the tips of the legs (tarsus) are short, the body is brown and beige.

Based on table 3 shows that the results of the examination of the carpet dust samples were found to be 9 HDM positive samples. The highest total density was found in carpet sample number 9 with a density of 7.24 mites/gram dust, while the lowest total HDM density was found in carpet sample number 5 with a density of

4.37 mites/gram dust. The total density of HDM found was 9 mites. The results of this study are different from those of Widiastawan *et al. (*2015) who reported that from 96 dust samples taken from beds, bedroom floors, and sofas in Manado City were positive for HDM. The highest HDM density was 36.92 mites/gram dust, bedroom floor 11.41 mites/gram dust, and sofa 15.94 mites/gram dust. Another study conducted by Arrahmi *et al*. (2019) reported that from a sample of 96 houses of 48 residents in Jati Village, Padang Timur District, Padang City, the TDR density on the bed (mattress and sheets) was 15.1 mites/gram of dust and 12 carpets, 02 mites/gram dust.

Based on table 1. shows that out of 9 houses that are HDM positive, only 1 occupant has a history of allergies/asthma. This result is different from Majawati dan Joselyn (2019) who reported that of the 17 houses that were positive for HDM, there were five houses with residents having a history of allergies/asthma, while of the 35 houses that were negative for HDM, only eight houses had a history of allergies/asthma.

Sampling suspected of having HDM was carried out on floors, carpets, and mattresses. The 9 houses sampled that were HDM positive were carpeted. According to Arrahmi *et al*. (2019), the carpet is a HDM habitat because the carpet material with fibers made of wool is a good habitat for HDM, besides that in this study, the carpet was rarely cleaned with a vacuum cleaner. Yu *et al.* (2015) added that mattresses can be the main habitat for HDM because when humans sleep, human skin flakes are left on the mattress, while human skin flakes are a food source for HDM. Therefore, locations such as floors, carpets, and mattresses need to be cleaned regularly. In this study, HDM was only found on the carpet because the frequency of cleaning the floor and mattress was carried out every day, while the frequency of cleaning the carpet was only once a month. This study is different from Majawati dan Joselyn (2019) who reported that among the sampling points such as floors, carpets, and mattresses only carpets there was no HDM found. This is because the frequency of carpet cleaning is maintained properly.

This study still has limitations in the form of a sample size that is too small. In this study, secondary data analysis has also not been carried out regarding the relationship of allergy/asthma with various factors as triggers for allergy/asthma and the researcher's difficulties in taking samples at each house in Jati Bulak Village, RT 003, RT 001, Jatimulya Village, Tambun Selatan District, Bekasi Regency.

Conclusion

This study concludes that among the three points of dust sampling locations, only the mattress found the presence of HDM with the genus Dermatophagoides sp. The HDM density in this study was between 4.53 – 7.24 mites/gram of dust with a low category.

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Medical and Islamic View of Alcoholic Cardiomyopathy

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ABSTRACT

Background: Cardiomyopathy is a heart muscle disorder so which the heart cannot contract optimally. Alcoholic cardiomyopathy is a type of cardiomyopathy that dilates due to long-term alcohol consumption. The prevalence of alcoholic cardiomyopathy is higher in men than women. The age group with the most alcoholic cardiomyopathy was 45 to 74 year. Death from alcoholic cardiomyopathy had an autopsy result marked muscle dilatation. A toxicological examination can show the level of alcohol consumed. The cause of death in alcoholic cardiomyopathy is muscle dilatation due to chronic ethanol abuse (Dolinak, 2005). Islam expressly forbids something that makes losing mind, like alcohol. Alcohol has many disadvantages for the consumer in the form of loss of mind and turning away from Allah.
Objective: This report aims to learn more about the definition, pathophysiology, clinical manifestation, and treatment of Alcoholic Cardiomyopathy. Also, Knowing and explaining Alcoholic Cardiomyopathy in terms of death and Islamic views. **Methods:** The design of this research is a literature review or library review, which is a systematic, direct, and reproducible research method by identifying, evaluating, and synthesizing published research. **Result**: Alcoholic cardiomyopathy is a clinical diagnosis made in a patient with a set of findings that include a history of excessive alcohol consumption, possible physical signs of alcohol abuse (e.g., parotid disease, telangiectasia or spider angiomata, altered mental status, cirrhosis), heart failure, and other evidence consistent with dilated cardiomyopathy. People who frequently consume alcohol can cause nutritional disorders, especially vitamin B1 deficiency can cause cardiomyopathy. Alcohol will also cause abnormalities in the structure and function of mitochondria in heart cells. These abnormalities include enlarged mitochondrial structure, decreased metabolism, lack of several enzymes decreased ion transport, increased calcium flow, glycogen accumulation, and decreased ATP production. **Conclusion:** Cardiomyopathy is a heart muscle function disorder characterized by the loss of the ability of the heart muscle to pump blood so that the blood supply is not optimal and results in death. The most common cause is chronic alcohol consumption, which causes dilatation of the heart muscle. At the same time, alcohol is an ingredient that is forbidden to be consumed by Muslims because of its more significant impact.

Introduction

Cardiomyopathy is a heart muscle disorder so which the heart cannot contract optimally. Cardiopathy causes excessive alcohol consumption, viral infections, hypertension, and others. Cardiomyopathy

has several classifications. Dilated cardiomyopathy, hypertrophic cardiomyopathy, and restrictive cardiomyopathy (Ram, 2018).

Alcoholic cardiomyopathy is a type of cardiomyopathy that dilates due to long-term alcohol consumption. The prevalence of alcoholic cardiomyopathy is higher in men than women. The age group with the most alcoholic cardiomyopathy was 45 to 74 years. Approximately one-third of each group had left ventricular dysfunction in a series of 50 asymptomatic alcoholic women and 100 asymptomatic alcoholic men. Compared to men, women who consume low doses of ethanol with body weight are more susceptible to left ventricular ejection fraction, so women are more sensitive to cardiac toxicity (Ram, 2018).

Alcohol and its metabolites are directly toxic to the heart. In addition, chronic ethanol abuse results in thiamine deficiency, resulting in the severity of cardiac disorders. Death from alcoholic cardiomyopathy had an autopsy result marked muscle dilatation. A toxicological examination can show the level of alcohol consumed. The cause of death in alcoholic cardiomyopathy is muscle dilatation due to chronic ethanol abuse (Dolinak, 2005). Islam expressly forbids something that makes losing mind, like alcohol. Alcohol has many disadvantages for the consumer in the form of loss of mind and turning away from Allah.

Methods

The design of this research is a literature review or library review, which is a systematic, direct, and reproducible research method by identifying, evaluating, and synthesizing published research.

Result and Discussion

A. Alcoholic Cardiomyopathy

1. Definition

Cardiomyopathy is a heart muscle function disorder characterized by loss of the ability of the heart muscle to pump blood. Moreover, usually beat and is not caused by congenital heart defects, hypertension, valvular disease, coronary artery disease, or pericardial abnormalities (Wynne J, 2005).

In cardiomyopathy, the myocardium is damaged or disrupted so that the heart cannot contract normally. As compensation, the heart muscle enlarges or undergoes hypertrophy, and the heart cavity enlarges. Simultaneously with this enlargement process, connective tissue proliferates and infiltrates the heart muscle. Cardiomyocytes are damaged and die, resulting in heart failure, arrhythmias, and sudden

death. Therefore, cardiomyopathy is considered a major cause of cardiovascular morbidity and mortality. Alcoholic cardiomyopathy is a clinical diagnosis made in a patient with a set of findings that include a history of excessive alcohol consumption, possible physical signs of alcohol abuse (e.g., parotid disease, telangiectasia or spider angiomata, altered mental status, cirrhosis), heart failure, and other evidence consistent with dilated cardiomyopathy. (Nasution SA, 2017).

Ethyl alcohol or Ethanol is a low molecular weight hydrocarbon. Ethanol is widely available as a beverage and ingredient in dietary extracts, cough-cold remedies, and mouthwashes. Ethanol poisoning is common in modern society because of its wide availability. This substance is often used with other substances in suicide attempts. Morbidity often comes from Ethanol or concomitant injuries and illnesses because Ethanol greatly increases the risk of trauma, especially trauma from motor vehicle collisions or violent crimes. Accumulation of alcohol in the blood can cause an increase in the anion gap and a decrease in bicarbonate levels. Substances that cause toxicity are -hydroxybutyric acid and Acetoacetic acid (Kraut JA, 2008).

2. Pathophysiology

a) Hypertrophic Cardiomyopathy

Massive ventricular hypertrophy is found in this disease, especially in the ventricular septum. Which causes the septum during systole to protrude into the left ventricular outflow tract and cause obstruction, and the right ventricle can be affected. Several degrees of myocardial fibrosis can be found. The mitral valve is displaced anteriorly due to hypertrophy of the papillary muscles, and the left ventricular space is filled with massive hypertrophy. Hemodynamic abnormalities occur due to hypertrophy, fibrosis, and heart muscle stiffness in the form of decreased cardiac distensibility, resulting in resistance in filling the left ventricle. However, the diastolic pump function remains normal until the end of the disease. Left ventricular outflow obstruction may develop due to abnormal positioning of the anterior leaflet of the mitral valve against a hypertrophied septum and a

variable peak systolic pressure gradient in the left ventricular outflow.

In contrast to obstruction caused by a permanently narrowed orifice, as in aortic stenosis, in hypertrophic cardiomyopathy, left ventricular outflow tract obstruction is dynamic and can change between examinations. The obstruction arises due to the preexisting narrowing of left ventricular outflow by the SAM from the mitral valve against the hypertrophied septum and midsystolic contact with the ventricular septum. Eighty percent of patients with hypertrophic cardiomyopathy have diastolic disorders and abnormalities in ventricular relaxation and filling. On the other hand, normal to super-normal systolic function. Most patients have a super-normal ejection fraction (75-80%) (Nasution SA, 2017).

b) Restrictive Cardiomyopathy

The pathophysiology of restrictive cardiomyopathy is decreased cardiac output, increased jugular venous pressure, and pulmonary congestion. In conditions with associated endocardial involvement, partial obliteration of the ventricular space by fibrous tissue and thrombus increases the resistance to ventricular filling. The ventricles cannot meet the demands of cardiac output and increased ventricular filling pressures, resulting in intolerance to physical activity and dyspnea, which are the main symptoms. As a result of the continued increase in venous pressure, patients with restrictive cardiomyopathy usually have edema, ascites, and an enlarged liver. Jugular venous pressure also increases on inspiration (Kussmaul's sign). Heart sounds can be heard far away, and third and fourth heart sounds can be heard (Taylor RB, 2005).

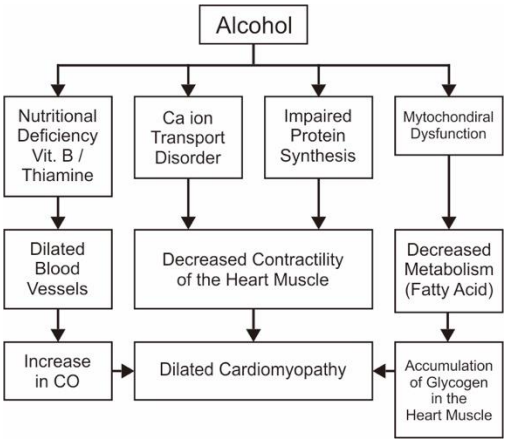
c) Dilated Cardiomyopathy

The primary physiological defects in the form of decreased strength of left ventricular contraction result in reduced stroke volume, lower ejection fraction, and end-systolic and end-diastolic volume increases. The left ventricle dilates, and the left atrial pressure increases, causing pulmonary hypertension

and right heart failure (Nasution SA, 2017).

People who frequently consume alcohol can cause nutritional disorders, especially vitamin B1 deficiency can cause cardiomyopathy. As with people who suffer from beriberi, there will be an increase in heart rate due to decreased blood vessel resistance (vasodilation).

Alcohol will also cause abnormalities in the structure and function of mitochondria in heart cells. These abnormalities include enlarged mitochondrial structure, decreased metabolism, lack of several enzymes decreased ion transport, increased calcium flow, glycogen accumulation, and decreased ATP production. A decrease in fatty acid metabolism characterizes it. Fatty acids are a source of hari for heart work. As a result, there will be a buildup of fatty acids in heart muscle cells. This accumulation of fatty acids will eventually inhibit protein synthesis in the heart muscle; inhibiting protein synthesis will also cause heart contraction disorders. In addition, the patient also found abnormalities of mitral regurgitation (mitral leakage), causing left ventricular dilatation.



Picture 1. Pathogenesis of Dilated Alcoholic Cardiomyopathy

3. Clinical Manifestation

The prominent clinical feature of dilated cardiomyopathy is congestive heart failure, which develops gradually in most patients. In some cases, atypical chest pain symptoms are often found, while typical cardiac chest pain is not common. If there are complaints of typical chest pain, it is thought that there may be concurrent systemic heart disease. As a result of systemic arrhythmias and emboli, syncope is quite common. In advanced disease, chest pain secondary to pulmonary embolism and abdominal pain due to congestive hepatomegaly may also be found (Wynne J, 2005).

Complaints often arise gradually, even most initially

asymptomatic, although left ventricular dilatation has occurred for months or even years. In hypertrophic cardiomyopathy, rhythm disturbances are common and cause palpitations, dizziness, and syncope. Systolic blood pressure may drop. Most cases are asymptomatic. Older people with hypertrophic cardiomyopathy often complain of shortness of breath due to heart failure and bothersome angina pectoris with atrial fibrillation. In advanced cases, the mitral valve can even be hardening/stiffening, which can give symptoms of mitral stenosis or regurgitation (Wynne J, 2005).

While in restrictive cardiomyopathy, patients often feel weak and short of breath. Found signs of right heart failure. Also signs and symptoms of systemic diseases such as amyloidosis and hemochromatosis (Wynne J, 2005).

4. Treatment

Management aims to improve quality of life by reducing complaints and complications, limiting symptoms, slowing disease progression, and preventing sudden death. Initial management should focus on the airway, respiratory rate, and circulation. Gastric decontamination is rarely required for all alcohols. Treatment for acute ethanol intoxication alone is usually symptomatic. Hypoglycemia and respiratory depression are two critical problems that must be addressed immediately. Hypoglycemia should be detected immediately from a rapid bedside blood glucose measurement in all intoxicated patients and must receive a dextrose infusion. Patients in a coma should receive at least 100 mg of parenteral thiamine to prevent or treat Wernicke's encephalopathy and dextrose. Intravenous (IV) crystalloids and vasopressor are used to treat hypotension if present. Patients may experience changes in consciousness such as restlessness, rudeness, and uncooperativeness. Chemical sedation such as benzodiazepines may be needed to prevent the patient from harming themselves or others. However, this drug should be used with caution because it can worsen respiratory depression caused by alcohol. Metadoxine is a specific new drug that is useful in treating acute alcohol poisoning, accelerating the excretion of Ethanol (Nasution SA, 2017).

Treatment of restrictive cardiomyopathy is generally tricky because this disease is not efficient to treat and also depends on the

accompanying disease. Antiarrhythmic drugs are given if there is a rhythm disturbance. Generally, arrhythmias can cause sudden death—insertion of a pacemaker for severe conduction disorders (Nasution SA, 2017).

Spontaneous improvement or stabilization may occur in about a quarter of patients with dilated cardiomyopathy. Death is due to heart failure, ventricular tachyarrhythmias, or ventricular bradyarrhythmias. Anticoagulation should be considered if systemic embolism is possible. Standard therapy for heart failure is sodium restriction, ACE inhibitors, diuretics, and digitalis resulting in symptomatic improvement. In dilated cardiomyopathy secondary to hypertension or valvular disease, afterload reduction is best achieved by adding hydralazine or nitrates to the standard treatment regimen for congestive heart failure.

B. Theory of Alcoholic Cardiomyopathy According to Islamic View

Khamr is any intoxicating drink, whether wine or cooked or not. Alcohol is a general term for any organic compound with a functional group called a hydroxyl group (-OH) attached to a carbon atom. Islamic teachings aim to maintain the safety of religion, soul, mind, lineage, and property. For this reason, everything that provides benefits for achieving these goals is ordered, recommended, or permitted to be done, while those who are disadvantaged are not recommended. Drinking a drink that destroys the human mind, such as alcohol, is haraam. Islam strictly forbids khamr and gambling for all Muslims based on the texts of the Qur'an and hadith (MUI, 2009).

As in the word of God in the letter Al-Baqarah verse 168:

يَٰٓأَيُّهَا ٱلنَّاسُ كُلُواْ مِمَّا فِي ٱلۡأَرۡضِ حَلَٰلٗا طَيِّبٗا وَلَا تَتَّبِعُواْ خُطُوَٰتِ ٱلشَّيۡطَٰنِۚ إِنَّهُۥ لَكُمۡ عَدُوّٞ مُّبِينٌ ١٦٨

Which has meaning:

O humankind, eat what is lawful and good from what is on the earth, and do not follow the devil's steps; for verily the devil is a real enemy to you (Surah Al-Baqarah, 168).

Based on the verse above, Allah encourages his people to eat halal and good food and leave the haram, which is forbidden is khamr. Allah commands Muslims to stay away from khamr because it is rijsun (dirty) and contains many losses in the form of loss of mind and turn away from Allah (Yusuf, 2011).

As in the word of God in the letter An-Nisa verse 43:

يَٰٓأَيُّهَا ٱلَّذِينَ ءَامَنُواْ لَا تَقۡرَبُواْ ٱلصَّلَوٰةَ وَأَنتُمۡ سُكَٰرَىٰ حَتَّىٰ تَعۡلَمُواْ مَا تَقُولُونَ

Which has meaning:

You who believe, do not pray while you are drunk so that you understand what you are saying (Surah An-Nisa 43).

Although the verse contains a prohibition against drinking liquor, because it has not been stated explicitly, there are still many people who consume it, so that one day it causes a commotion and a fight. Then came down QS. Al-Maidah: 90, which strictly forbids drinking alcohol.

As in the word of God in the letter Al-Maidah verse 90-91:

يَٰٓأَيُّهَا ٱلَّذِينَ ءَامَنُوٓاْ إِنَّمَا ٱلۡخَمۡرُ وَٱلۡمَيۡسِرُ وَٱلۡأَنصَابُ وَٱلۡأَزۡلَٰمُ رِجۡسٞ مِّنۡ عَمَلِ ٱلشَّيۡطَٰنِ فَٱجۡتَنِبُوهُ لَعَلَّكُمۡ تُفۡلِحُونَ ٩٠ إِنَّمَا يُرِيدُ ٱلشَّيۡطَٰنُ أَن يُوقِعَ بَيۡنَكُمُ ٱلۡعَدَٰوَةَ وَٱلۡبَغۡضَآءَ فِي ٱلۡخَمۡرِ وَٱلۡمَيۡسِرِ وَيَصُدَّكُمۡ عَن ذِكۡرِ ٱللَّهِ وَعَنِ ٱلصَّلَوٰةِۖ فَهَلۡ أَنتُم مُّنتَهُونَ ٩١

Which has meaning:

You who believe, verily (drinking) khamr, gambling, (sacrificing for) idols, drawing fate with arrows are among the devil's actions. So stay away from it so that you get good luck. Indeed, the devil intends to create enmity and hatred between you because it can prevent you from remembering Allah and praying; then stop you (from doing the work) (Surah Al-Maidah 90-91).

People who are used to drinking khamr will always do this; they will not hesitate to steal, rob, and commit other crimes to vent their dependence (Yusuf, 2011).

In general, drinking alcohol damages all organs of the body gradually as a result of acute brain disorders (intoxication, delirium) or chronic (ataxia, motor disorders), liver inflammation (liver cirrhosis), stomach bleeding, sex hormone disorders and immunity, and bias. It results in alcoholic cardiomyopathy, which can result in death due to loss of heart contraction so that the heart cannot pump.

Following are the words of the Prophet Muhammad SAW:

عن ابن عمر انّ رسول الله صلىّ الله عليه وسلّم قال كلّ مسكر خمر وكلّ مسكرحرام

Which has meaning:

From Ibn Umar R.A. that the prophet Muhammad SAW said: every intoxicating object is khamr, and every intoxicating object is haram" (HARI. Muslim).

Conclusion

Cardiomyopathy is a heart muscle function disorder characterized by the loss of the ability of the heart muscle to pump blood so that the blood supply is not optimal and results in death. The most common cause is chronic alcohol consumption,

which causes dilatation of the heart muscle. At the same time, alcohol is an ingredient that is forbidden to be consumed by Muslims because of its more significant impact.

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Drowning Deaths: A Literature Review

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ABSTRACT

Background: The process of drowning begins with respiratory distress either because a person's airway is below the surface of the liquid (submersion) or the water only covers the face (immersion) (Putra, 2020). In a body submerged in water and suspected of having died from drowning, it is necessary to determine whether the victim was still alive at the time of the drowning. The probability was marked by intravital signs, whether there were other signs of violence or the cause of death. All these things can be determined through an external and internal body examination of the corpse and are supported by supporting examinations. With this series of examinations, the diagnosis of drowning can be established, and the cause and mechanism of death of the bodies found can be estimated. Doctors in forensic medicine have an important role in cases of drowning deaths, such as in helping to identify victims and determine the cause of death. (Armstrong & Erskine, 2018).

Objective: This report aims to learn more about drowning deaths, the classification, the pathophysiology of drowning deaths, and the process of investigating drowning deaths.

Conclusion: Drowning is asphyxia that prevents air entry into the lungs by inhaling fluid into the airways, i.e., nose and mouth. Cases of drowning death are caused by irreversible brain damage in the development of irreversible cerebral anoxia and hypoxia. There are two classifications of drowning, namely Dry Drowning and Wet Drowning. Doctors in the field of forensic medicine have an important role in cases of drowning deaths, such as in helping efforts to identify victims and determine the cause of death. The investigation process includes Pre-Autopsy Preparation and Interest in Victim History, External Findings, Internal Meetings, and Special Tests.

Introduction

Drowning is asphyxia that prevents the entry of air into the lungs through the inhalation of fluids into the airways, namely, the nose and mouth (Chaudary & Dhingra, 2021; WHO, 2021). The process of drowning begins with respiratory distress either because a person's airway is below the surface of the liquid (submersion) or the water only covers the face (immersion) (Putra, 2020). In drowning cases, death is caused by irreversible brain damage in the

development of irreversible cerebral anoxia and hypoxia. Only a systematic examination and a complete autopsy can determine death as a symptom of drowning asphyxia (Chaudary & Dhingra, 2021).

In a body submerged in water and suspected of having died from drowning, it is necessary to determine whether the victim was still alive at the time of the drowning. The probability was marked by intravital signs, whether there were other signs of violence or the cause of death. All these things can be determined through an external and internal body examination of the corpse and are supported by supporting examinations. With this series of examinations, the diagnosis of drowning can be established, and the cause and mechanism of death of the bodies found can be estimated. Doctors in forensic medicine have an important role in cases of drowning deaths, such as in helping to identify victims and determine the cause of death. (Armstrong & Erskine, 2018).

Objective

This report aims to learn more about drowning deaths, the classification, the pathophysiology of drowning deaths, and the process of investigating drowning deaths.

Discussion

1. Definition

Drowning is defined as an influx of sufficient fluid that is not required. The latest definition adopted by the World Health Organization (WHO) in 2002 states that drowning is a process of respiratory distress due to submersion or immersion in liquid. The process of drowning begins with respiratory distress either because a person's airway is below the surface of the liquid (submersion) or the water only covers the face (immersion) (Szpilman, 2016).

2. Classification

a. Dry Drowning

In this type, the victim does not die from swallowing or inhaling large amounts of water causing obstruction, but death due to laryngeal spasm, immersion syndrome, and submersion due to unconsciousness, called shallow water drowning.

1) Immersion Syndrom/Vagal Inhibition

In this type of drowning, death is not caused by drowning but is caused by cardiac arrest due to vagal inhibition. The sudden contact with cold water on body surfaces, stimulates nerve endings and causes vagal inhibition. Especially the

epigastrium, ears, nasal hairs, larynx, pharynx,

2) Laryngeal Spasm

Water that suddenly enters the larynx can stimulate the occurrence of laryngeal spasm, which aims to inhibit the water to enter the respiratory tract, and death occurs because of asphyxia; after some time after death, water can enter the respiratory tract (lungs).

3) Shallow Water Drowning

The drowning occurred in a small pool of water where the depth was only a few centimeters but deep enough to drown the mouth and nose hairs. This occurrence often occurs in young children and people with disabilities such as epilepsy or coma due to head injury, etc.

b. Wet Drowning

Wet drowning occurs because water is swallowed and inhaled, so the respiratory tract is closed and filled with water. Wet drowning is the most common type of drowning. It mainly occurs in freshwater or salt water.

3. PATHOPHYSIOLOGY

a. Mechanism

The mechanism of death in drowning victims can be asphyxia due to laryngeal spasm, asphyxia due to gagging and choking, vagal reflexes, ventricular fibrillation (freshwater), and pulmonary edema (in salt water) (Forensic Medicine, 2012).

1) Vagal Reflex

The death occurred very quickly, and on post-mortem examination, there were no signs of asphyxia or water in the lungs, so it was often called dry drowning.

2) Laryngeal Spasms

Death from laryngeal spasm in drowning is infrequent. A laryngeal spasm is caused by the stimulation of water entering the larynx. On post-mortem examination, there were signs of asphyxia, but the lungs were not found to contain water or water objects.

3) The effect of water entering the lungs

Hypoxia and acidosis and the multiorgan effects of these processes contribute to the morbidity and mortality of drowning. Central nervous system damage may result from hypoxemia resulting from drowning (primary damage), arrhythmias, pulmonary disorders, or multiorgan dysfunction.

The event of drowning in freshwater will cause anoxia accompanied by

electrolyte disturbances. The fluid that is aspirated and lodged in the lungs produces vagus-mediated vasoconstriction and hypertension. Freshwater moves faster from the capillary-alveoli membrane to the microcirculation. This will result in hemodilution and hemolysis. With the breakdown of electrolytes, the intracellular potassium ions will be released, causing hyperkalemia which will affect the work of the heart (ventricular fibrillation occurs). A post-mortem examination found signs of asphyxia; the right heart's NaCl level was higher than the left heart, and the presence of foam and water objects in the lungs. In addition, freshwater tends to be more hypotonic than the plasma and causes alveolar surfactant disturbance. This will lead to alveolar instability, atelectasis, and decreased lung compliance (Forensic Medicine, 2012; Hussein, 2019).

The event of drowning in salt water will result in anoxia and hemoconcentration. Water will be drawn from the pulmonary circulation into the interstitial lung tissue, which will cause pulmonary edema, hemoconcentration, and hypovolemia—no electrolyte disturbances. On post-mortem examination, there were signs of asphyxia, NaCl levels in the left heart were higher than in the right heart, and foam and watery bodies were found. Death from drowning in salt water is slower than drowning in fresh water. Saltwater, which is hyperosmolar, will draw fluid into the alveoli and cause dilution of the surfactant. The protein-rich fluid exudes rapidly into the alveoli and the pulmonary interstitium. This causes reduced lung compliance, the capillary-alveolar membrane is damaged, and fluid transfer occurs, resulting in hypoxia (Forensic Medicine, 2012).

b. Wet Drowning

In wet drowning, where the inhalation of liquid occurs, it is known that the victim is holding his breath. Due to increased CO2 and decreased O2 levels, gasping and regurgitation, and aspiration of gastric contents may occur. Reflex laryngospasm followed by an influx of water will appear. Then the victim loses consciousness, and apnea occurs. The patient will then gasp again for a few minutes, and even the patient can have seizures. Patients can then end up with a respiratory and cardiac arrest.

c. Dry Drowning

This death usually occurs very suddenly and shows no signs of resistance. The exact mechanism of death remains speculative. The sudden entry of fluids can cause two types of death mechanisms;

1) Laryngospasm, which will cause asphyxia and death.
2) Activate the parasympathetic nervous system so that a vagal reflex occurs, resulting in cardiac arrest.

Several factors predispose to death due to dry drowning:

1) Alcohol intoxication (depresses cortical activity)
2) Pre-existing disease, such as atherosclerosis
3) Unexpected/ sudden drowning/ submersion

Fear or excessive physical activity increases circulating catecholamines, accompanied by a lack of oxygen, which can lead to cardiac arrest.

4. INVESTIGATION PROCESS

a. Pre-Autopsy Preparation and Importance of Victim History

In the case of death due to drowning, in addition to information obtained from the autopsy results, examination of the crime scene (TKP), investigation of the patient's history before death, and pre-autopsy preparation play an essential role in concluding the cause of death. Dr. Joseph H. Davis proposed an equation called the "sink equation" where drowning is a constant (and a result), while human and factor of environment are variables. From this equation emerge questions that can guide the course of the investigation, which include Was the victim alive or dead before entering the water? Did the victim drown? Why and how did the victim enter the water? Why can't the victim survive in the water? (Armstrong & Erskine, 2018).

The crime scene investigation and history taking before the victim dies consists of several components—first, an investigation of the location and condition of the water. A corpse found on the beach can raise various questions, whether the corpse was stranded? Was the body moved from another location? Did the corpse initially faint and then die near the water due to some cause? Another example could be a corpse found in a bathroom tub; questions that might arise include Was the death caused by a severe illness, was it caused by drowning, or drowning with other factors such as alcohol or drug intoxication? Drowning can occur in small places with a small volume of water, such as sewers, sinks, hot tubs, or buckets which are usually accessible places if you want to escape. Still, we must suspect other factors that support the drowning incident, such as intoxication and illness: catastrophic injury, disability, and youth (Armstrong & Erskine, 2018).

Second, investigation of the corpse's position, condition, and temperature. Knowing the body's position when it was first discovered is an essential step in determining whether the body is immersion, submersion, or

complete submersion. The corpse's condition and body shape can determine the time of death and the postmortem submersion interval (PMSI). In addition to the condition and integrity of the corpse, there are several things to consider, whether the body is dry or wet and whether clothes are covering it. In the case of sinking in the bathtub, signs of bathing should be found, such as wet towels, proximity to electronic devices, soap-soaked body, etc. Body temperature is palpable and measured compared to the temperature of the water at the crime scene; frigid water can lead to signs of hypothermia (Armstrong & Erskine, 2018).

Third, identification of the victim, which includes medical history, history of medication or substance use, and psychiatric history, can guide investigations and explain the reasons for drowning.

Fourth, gathering evidence. In the case of drowning in a swimming pool, some of the evidence needed includes information on the presence of a lifeguard, video surveillance, eyewitnesses, evidence of access through an emergency exit, and the ability to swim. Meanwhile, in the case of drowning in the open, some of the information needed is the underwater topography and surrounding land, temperature and water conditions, the presence of safety equipment, signs of intoxication, types of clothing, and signs of trauma to the body.

Fifth, information on the condition of the crime scene, recovery of evidence, recovery of corpses, and resuscitation efforts can help pathological forensic experts to interpret autopsy findings and conclude the cause of death (Armstrong & Erskine, 2018).

Pre-autopsy preparation includes;

1) Tracing evidence and collecting evidence,
2) Gathering information related to the victim's DNA which includes the body and other foreign objects,
3) Imaging which includes postmortem radiographs and CT scans.

DNA information can be obtained from biological fluids such as saliva, blood, and semen; in addition, it can also be found in fingerprints, radiographic documentation, or typical bones such as craniofacial sinuses, as well as odontological examinations. However, the success of DNA identification can be disrupted due to the body undergoing prolonged submersion and decomposition (Armstrong & Erskine, 2018).

b. External Finding

1) Body and clothing are usually found in wet conditions and may be accompanied by stains from sand or mud.
2) The body's surface or skin feels cold and wet and looks pale, or sometimes it can appear green or brown. In addition, the skin can change texture like goose skin or what is called cutis anserina. This sign is a condition of the skin that looks shriveled with hairs standing on end due to contraction of the erector pylorus muscles due to body contact with cold water.
3) Maceration of the skin or washer woman's hand. Submerging conditions for a long time can cause the skin's maceration, especially the feet and hands, and also areas prone to friction. These areas of skin may turn white and wrinkle. After that, the epidermis layer becomes loose and causes the nails to fall out of place. The term washer woman's hand was taken because of the similarity obtained in the hands of women who wash clothes for a long time. This sign cannot explain antemortem or post-mortem conditions but can only estimate the length of time drowning. This sign is caused by the imbibition process where water enters the outermost layer of the skin. These marks appear on the fingertips in the first 3-4 hours after drowning and will cover all parts of the hand after 24 hours. The following changes can determine the length of time to sink:
   a) Wrinkles on the skin can appear immediately after drowning it in cold water.
   b) Changes in the cuticle to white can occur 12 hours after drowning.
   c) Wrinkles and changes in skin color to white can be seen within 24 hours.
   d) The cuticle begins to separate from the palms of the hands and feet within 48 hours of drowning.
4) Post-mortem hypostasis will be seen on the chest's head, neck, and front. This process causes some parts of the body to undergo decomposition more quickly. Some will change to a pink color, similar to a victim of carbon monoxide poisoning. In contrast, other body parts are still fresh. This is because the victim drowns. His body will float on the surface of the water, which causes the head and face to be lower than most other body parts because the head is relatively heavier. The chest is the uppermost or protruding part of the body because the lungs and gastrointestinal tract are full of gas.

5) In the eyes, especially in the conjunctiva, signs of congestion may appear. Some bleeding spots on the conjunctiva may be seen.
6) Rigid corpse. The appearance of a dead body indicates that the victim was still alive when he drowned. Grass, mud, soil, sea algae, or other aquatic vegetation can be found in the victim's hands and gripped tightly due to the stiffness of the corpse.
7) Fine white foam or foam coming out of the mouth or nostrils is an important phenomenon. Sometimes, the foam may not appear when the body is found but can appear after pressing on the body's chest. The foam can be vertically elongated or conical and even shaped like a balloon or mushroom. Foam consisting of fine bubbles is not easy to break even if touched by the tip of a knife. This foam is produced from the mixing process between already, mucus and water in the respiratory tract. In addition, the froth or foam can be mixed with blood from lung tissue damage; or mixed with debris and gastric contents (Bardale, 2016; Vij K, 2018).

c. Internal Findings

1) Injuries and Injury Patterns

Damages of different types from impact can be found and are essential to document. Such as with the surface of water, a bottom surface, moving or fixed objects, predation, or boat and boat collisions. Resuscitation injuries are frequently recognized by the location and pattern. Such as, sternal fractures, anterior rib fractures, and contusions of the tongue and pharynx. Determination of whether the injury has the potential to be lethal or contributed to the resulting disabling effect is necessary.

Table 15.8: Difference between antemortem and postmortem drowning

Features	*Antemortem drowning*	*Postmortem drowning*
Cadaveric spasm	May be seen	Absent
Froth	Fine, whitish, copious, leathery, tenacious, increases on compression of chest	No froth
Stomach and intestine	Water may be present. May also present sand, mud, grit, silt etc	Absent
Respiratory tract	Contains fine froth. May contain mud, sand, vegetations etc	Absent
Middle ear and mastoid air cell	Hemorrhage present	No hemorrhage

(Bardale, 2011)

Table 1. The Difference Between Antemortem and Postemortem Drowning.

2) Decomposition Change

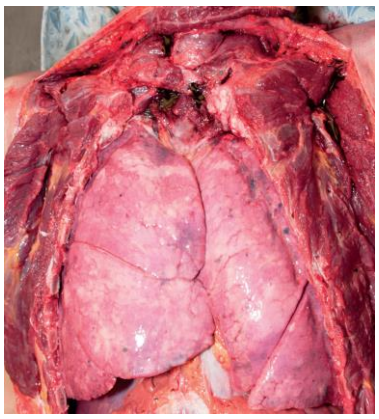
A body in a humid or wet environment for long months until years may generate adipocere, a thick gray-white substance due to bacterial-mediated hydrolysis of body fat. The development time of adipocere varies depending on the factors involved. Attached to other aqueous environments, its preservative qualities are identified, including preservation of anatomy, toxicological evidence, and bone injury (Armstrong & Erskine, 2018).

Colonization by larvae, algae, and bacteria is part of decomposition. It may be seen and has been used in estimating PMSI and time of death. Sometimes it requires expertise in entomology and botany to identify the location of death. Determinations made by a forensic entomologist or botanist can be a critical investigation in the reconstruction of the circumstances leading up to death and identification of the deceased. In the case of prolonged immersion, decomposition is rapid after recovery, and these changes may obscure preexisting antemortem or postmortem findings. Therefore, rapid cooling followed by autopsy performance is required (Armstrong & Erskine, 2018).

3) Drowning Support Findings

a) Chages in The Lungs

(1) Appearance**:** Classically, in situ examination, the lungs will appear thick, boggy, and crepitus with apposition or overlapping of the medial edges (Armstrong & Erskine, 2018). At the cut, out fine foam, a lot. In submerged freshwater, the lungs retain their shape. In saltwater immersion, the lung becomes heavy, slack, and distended. The excised part emits a large amount of foamy fluid, and the cut part does not retain its shape (Bardale, 2016).



(a)

(b)

(Armstrong & Erskine, 2018)

Picture 1. Changes in the Drowning Lung

(a) Thick lung with medial margin apposition & (b) Pulmonary edema with bronchial froth exudation.

(b) Paltauff Bleeding**:** It is a subpleural hemorrhage that mainly occurs on the anterior surface and edges of the lung, caused by a rupture of the interalveolar portion under the pleura (Bardale, 2016; Putra, 2014; Wulur, 2013).

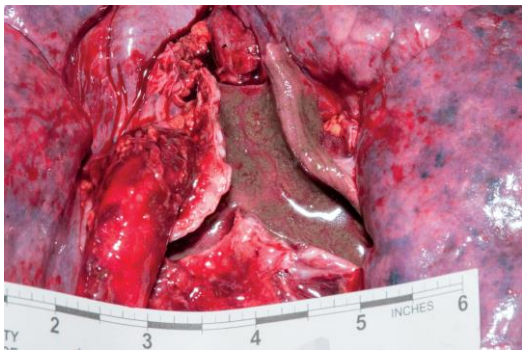
(Bardale, 2011)

Picture 2. Paltauff Bleeding

(c) Emphysema aquosum: Lungs feel heavy, pale, spongy, and caught in the water. This condition is known as emphysema aquosum. This condition indicates that the person is conscious and struggling to live. Emphysema aquosum is highlighted as an essential sign of drowning. The correct interpretation of lung changes as emphysema aquosum is important. From the experience of our autopsy material, it shows that hyperinflated lungs often contain additional edema fluid. Edema fluid can also be observed in cases of left heart failure, poisoning, or prolonged resuscitation. Combining these lung markers with foaming in the airways might create higher diagnostic accuracy (Schneppel, Doctors, & Bockholdt, 2020).

(d) Edema aquosum: This condition develops when a person is passively submerged without significant effort to breathe underwater or when the person is unconscious. This is a state of flooding the lungs with water without forming a foam column (Bardale, 2016).

(e) Respiratory tract shows whitish, fine froth and may show sand, silt, silt, grit, vegetation, etc. (Bardale, 2016).



(Armstrong & Erskine, 2018)

Picture 4. The silt in Tracheobronchial

(f) Weight of the lung: The weight of the submerged lung is about 600 to 700 grams, while the non-submerged lung weighs about 370 to 540 grams.

b) Changes in The Heart and Blood Vessels

The obstruction of pulmonary circulation from inhaling water results in distention of the right heart and large vein, which is usually found to be filled with dark blood. Dilution of blood by inhaled water usually prevents coagulation (Vij, 2018).

c) Drowning Stomach

The abdomen may contain water and foreign objects such as sand, mud, weeds, etc., which may be swallowed while drowning while struggling to live. The possibility of the victim ingesting water before drowning should also be noted. So a chemical analysis of the stomach contents showing a composition identical to the immersion medium is helpful. The presence of unpleasant material such as muddy water, liquid feces, aquatic vegetation, etc., which cannot be swallowed voluntarily, strongly indicates antemortem drowning. The lack of water in the abdomen may indicate sudden death due to vagal inhibition, shock, unconsciousness before falling into the water, death from laryngeal spasm, etc. Microscopic and chemical examinations need to be done as well. Traces of soap are often detected in cases of drowning in bathtubs (Vij, 2018).

In addition, dilution of intestinal contents may be seen, Wydler's sign (depicts three layers of foamy upper phase consisting of a mixture of sinking fluid and tracheal secretions, located in the moderate liquid phase and food particles on the bottom), gastric mucosal lesions, mucosal lesions in the stomach, basically as a localized

longitudinal tear in the body or fundus (Schneppel, Doctors, & Bockholdt, 2020).

d) Bleeding in The Middle Ear

Water can be found in the middle ear and is claimed to be positive evidence of antemortem drowning. Water is forced into the middle ear during a vigorous respiratory effort (Bardale, 2016).

In addition, there may also be bleeding in the middle ear and mastoid air cells, with the pathogenesis of this bleeding unclear. However, it may be caused by barotrauma. Such as, the differences between the pressure of middle ear and the surrounding water, and then it produces a relative vacuum. Negative pressure within this closed cavity causes stretching—of the tympanic membrane inward and bleeding in extreme cases. Haarkoff and Weiler (1971) found bleeding in the tegmen tympani in 80 out of 100 deaths from all causes (Vij, 2018).

4) Natural Diseases with Deadly Potential

Identification of a natural disease entity with apparent mortality (i.e., aortic dissection with hemoperitoneum) or potentially lethal (e.g., severe coronary atherosclerosis) is sufficient to preclude drowning has a clear cause and manner of the implication of death along with the absence of supporting findings.

5) Postemortem Toxicology Test

Additional testing of body fluids and tissues is essential in all water-related deaths. Including blood (central and peripheral), vitreous fluid, skeletal muscle gastric fluid, urine, visceral, adipose tissue, isolated hematoma, and even body hair can be candidates for submission and analysis. Toxicological analysis of adipocere has yielded valuable results.

The discovery of specific drugs and medications can discern the deceased person's medical record. Moreover, psychiatric history, drug consumption record, the extent of damage around the time of death, and assistance in the reconstruction of the events guiding up to death are specifically relevant in cases where the history of the deceased is unidentified. Depending on the drug or treatment in question and end-organ effects, concentrations may be adequate to prevent drowning, with little or no discoveries supporting drowning noted at autopsy. For example, ethanol and

specific drugs are associated with prolonging the QT interval and, when mixed with holding breath during swimming, can initiate disabling arrhythmias and lead to drowning.

6) Histology

Histological contributions can be made by the changes brought about by the sinking process and the medium in which it occurs. The physical status of the previous victim and injuries (if any) that could have caused death or contributed to its occurrence must be considered. Some statuses are the depth of the water where the corpse is located, water temperature, fresh or salt water, the contaminants in the water, and the general state of preservation of the remains. At least one central and one peripheral section should be examined from each lobe of the lung, and the material should be extracted in such a way as to avoid bruising. In addition to the lungs, the liver, heart muscle, and kidneys can also be checked for signs of acute oxygen deprivation and shortness of breath (Vij, 2018).

Significant lung histologic findings usually appear in the form of distended and fluid-filled lung alveoli with foreign material such as aquatic vegetation. The walls of the alveolar septum appear stretched and thinned by capillary compression, along with several ruptured alveoli (Bardale, 2016).

Histologically detectable expansion of the alveoli is expected to be most prominent When drowning occurs over a relatively long period. The victim comes to the surface several times and thus breathes air. Studies of fast and slow sinking differentiation mostly show only quantitative differences. In cases of rapid drowning, there are prominent features such as emphysematous expansion, partial rupture of the alveolar septa, empty alveolar space, and capillary dilatation. Whereas, in the case of slow drowning, the findings are essentially similar, although less quantitatively clear. Janssen has reviewed the subject and concluded that histological changes might aid in the diagnosis of drowning but should be evaluated in conjunction with other findings and the circumstances of the case (Vij, 2018).

Drowning in fresh water indicates a low red blood cell count with hemolysis. In the submergence of seawater, the relative increase in the number of red blood cells with red blood cells looks wrinkled and shrunken (Bardale, 2016).

d. Special Test

Drowning fluid diffuses across the alveolar-capillary membrane and into

the active circulating blood during drowning. Various tests have been developed to measure the amount of diffuse substance to diagnose drowning. In addition, reliable tests that consistently and reliably distinguish freshwater from saltwater sinks remain elusive, which could otherwise be necessary for confirming the location of sinks (Armstrong & Erskine, 2018).

Many laboratory investigations have been reported to diagnose drowning. In 1921, Alexander Gettler, a Toxicologist from the Department of Medical Examiners, New York City, suggested a comparison between the chloride content of blood from the right and left sides of the heart. This test is known as the Gettler test (Vij, 2011). Gettler's tests have historical importance and no practical importance. According to Gettler, hemodilution due to drowning in freshwater reduces the plasma concentration of the chloride content of the blood on the left side of the heart (Bardale, 2011). Usually, the chloride content of the left and right sides of the heart is the same, about 600 mg per 100 ml. The difference between the two chambers should be less than 5 mg/100 ml under normal circumstances. In the case of drowning in fresh water, the chloride content of the left heart is lower than that of the right heart. In the case of drowning in salt water, the opposite situation is observed (Vij, 2011). So it is said that the difference of 25 mg/100 ml of chloride between the right and left sides of the heart is considered significant (Bardale, 2011). Gettler's observations have been challenged by many workers and are no longer accepted. It has been shown that changes in blood chloride content are a common postmortem phenomenon and occur regardless of drowning. The rate of change may differ on each side of the heart (Vij, 2018).

In addition, there is a strontium test. Namely, the difference in strontium concentration of 75 g/L between the right and left hearts is considered significant in cases of seawater drowning (Bardale, 2016).

In 1944, Mortiz suggested magnesium as more reliable than the chloride, especially for determining the sinking of seawater. In 1955, Freimuth et al., based on the specific gravity of plasma from the two sides of the heart, concluded that a negative difference between the left and right sides could be observed in drowning and non-drowning cases. In contrast, positive values usually indicated that death was caused by means other than drowning. Since then many have worked on changes in serum electrolyte content due to drowning, but

the results have been unsatisfactory. Factors that may obscure the reliability of chemical test results may be the rapid onset of postmortem changes in blood and tissues and the various body conditions to which they are typically exposed (Vij, 2018).

Since the chemical tests portrayed already may not meet the exactness required within the legal field, circumstances required the disclosure of a few more dependable methods. The breakthrough within the determination of passing by drowning was accomplished in 1904 by Revenstorf, who, to begin with, attempted to utilize diatoms as a test for suffocating. However, he expressed that Hofmann, in 1896, was the primary to discover it in lung liquid. Peabody distributed a curious survey of the diatom contention in 1980.

The diatom test is based on the principle of diatom penetration. When a living person is immersed in water, many diatoms will penetrate the walls of the alveolus and be carried to distant organs such as the brain and kidney, liver, bone marrow, etc. Diatoms are unicellular algae found wherever there's adequate water and sunlight for photosynthesis. Diatoms have a place in a class of plants known as Diatomaceae. More than 10,000 species have been portrayed, by and large, 40 to 200 m in breadth or length (Bardale, 2016). The cell walls are composed of transparent opaline silica and are decorated with intricate and striking silica patterns. Traditionally diatoms are divided into two distinct forms: centric diatoms (Centrales), which are radially symmetrical, and pennate diatoms, which are bilaterally symmetrical (Pennales), but these are further classified into three classes: centric diatoms (Coscinodiscophyceae), pennate diatoms without raphes. (Fragillariophyceae), and pennate diatoms with raphes (Bacillariophyceae). Diatoms are unicellular organizations, but some form colonies (Chaudhary & Dhingra, 2021). Diatoms are classified as follows: 1) Oligohalophilic diatoms: live in freshwater, 2) Mesohalophilic diatoms: live in the sea or brackish water, 3) Polyhalophilic diatoms: live in the sea or brackish water (Bardale, 2016).

The guideline for testing diatoms for drowning is that when a body is kept in water, diatoms can reach the lungs by passive permeation but are not too removed due to the nonappearance of circulation.

The diatom demonstration procedure is that 2-5 grams of tissue or bone marrow are taken, placed in a glass flask, and added to concentrated nitric

acid. Then the preparation is heated for 15-20 minutes, and a transparent yellow liquid is produced. The centrifuged liquid and the precipitate were examined by placing a cover slip.

This diatom test has several interests. The demonstration of a significant number of diatoms indicates death by drowning, the person is still alive when he is submerged in water. The location of drowning can be determined by comparing the diatom species in the body and the source/location of the body being found. The advantage is that diatoms resist decomposition and can be demonstrated even in highly decomposed bodies (Bardale, 2016).

Lung Examination

This examination is a type of microscopic examination where the tissue and fluid contained in the lungs are taken and will be observed under a microscope. Where later will be searched for the presence of foreign objects with the help of a light microscope. The basis of this examination is that fluid entering the lungs can cause foreign objects such as sand, diatoms, and algae to penetrate the circulation through diffusion and osmosis to the blood vessels. The foreign objects that may be found are:

a. Sand

This is often found during inspections because drowning events generally occur in rivers or the sea, where sand is often found at the bottom. These sands also frequently appear on macroscopic internal examination and not only in the lungs and airways but also in the esophagus and stomach.

b. Diatom

Diatoms are unicellular algae found wherever there is water belonging to Bacillariophyta. 6 More than 10,000 species have been found with diameters or lengths ranging from 40-200 m. The shape also varies from needle-like to sphere (ball). The most forensically significant aspect of diatoms is their ability to envelop themselves with a silica-like wall called a frustule. The discovery of diatoms on microscopic examination is the gold standard for diagnosing drowning. The standard principles include qualitative and quantitative analysis of diatoms in organs related to the analysis of diatoms under sinking conditions. However, until now, this examination still has controversy. First, diatoms may be absent when the macroscopic diagnosis of drowning is precise. For example, when the victim is found dead followed by a brief survival struggle or when monthly variations occur due to often

disturbing climatic influences. This can also explain why in the case of drowning in freshwater, only one-third of cases diatoms are found. Although in the open ocean, diatoms cannot be used as the primary benchmark for diagnosing drowning. Diatoms are sometimes found in people who do not drown. It is said that someone who consumes shrimp and oyster shells will consume about 2 million diatoms per year.

Meanwhile, on examination, if five diatom frustules are found in 10 grams of bone marrow, the diagnosis will be positive for drowning. So far, there is no evidence that diatoms cannot enter the circulation through the digestive tract. Of course, it will cause a false positive result. In addition, the method used to examine diatoms, such as highly acidic liquids and Soluene-350 can destroy diatoms found in the sea, which are very fragile. In addition, the number of diatoms on earth will decrease due to pollution on the water's surface. As happened in Belgium, only one species is still alive, namely Eunotia exigua. 4 This is why the examination of diatoms is still controversial today.

c. Algae

The discovery of algae can be more informative in the case of drowning in water that has few diatoms. However, destructive methods such as Soluene-350 as a solvent should be avoided. Chlorophyll can also be found in the lungs using spectrofluorometric methods, but this is still in the experimental phase. Detection of phytoplankton genes can also be helpful. However, in some samples of rabbits that were not drowned, post-mortem penetration of phytoplankton was found in the respiratory system.

d. Worm eggs

Worm eggs may be found where the victim drowned in the water and was contaminated with feces containing this.

Pulmonary Examination

A lung float test is done to determine if the baby being examined was alive. To do this test, the requirements are the same as the air embolism test: the corpse must be fresh (Forensic Medicine, 2012).

Remove the tools in the oral cavity, neck, and chest cavity in one unit, the base of the esophagus and trachea can be tied.

a. Float all the tools in a tub filled with water.
b. When floating, release the lungs, both left and right.
c. Float the two lung organs. If floating continues with the separation of each lobe, the right has five lobes, and the left has two lobes.
d. Float all the lobes. Note which one sinks and which one floats.

e. The floating lobes were taken partially, i.e., each lobe five pieces with a size of 5 mm x 5 mm, from a separate and peripheral place.
f. Float the 25 small pieces. If they float, place the pieces on two cartons, do the trampling using the body weight, then put them back in the water.
g. If floating means a positive pulmonary buoyancy test, the lungs contain air, and the baby is born alive.

If only part of the float, the possibility of partial respiration, the baby was stillborn alive.

Conclusion

Drowning is asphyxia that prevents air entry into the lungs by inhaling fluid into the airways, i.e., nose and mouth. Drowning is the third driving cause of inadvertent harm passing. It accounts for about 4000 deaths annually within the Joined together States, where it is the tenth most common injury-related passing. Cases of drowning death are caused by irreversible brain damage in the development of irreversible cerebral anoxia and hypoxia. There are two classifications of drowning, namely Dry Drowning and Wet Drowning. Doctors in the field of forensic medicine have an important role in cases of drowning deaths, such as in helping efforts to identify victims and determine the cause of death. The investigation process includes Pre-Autopsy Preparation and Interest in Victim History, External Findings, Internal Meetings, and Special Tests.

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The Challenges of Diagnosing Drowning Death Case

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ABSTRACT

Background: According to the World Health Organization (WHO), about 0.7% of deaths worldwide, or 500,000 deaths worldwide each year, are caused by drowning. Drowning is the leading cause of death worldwide in boys aged 5-14. In the United States, drowning is the second leading cause of accidental death among children ages 1 to 4 years, with an average death rate of 3 per 1000 people. Based on the latest definition from WHO in 2002, drowning is a process of respiratory distress caused by submersion or immersion in liquid. Most drowning victims who drink only a small amount of water usually get better on their own. Less than 6% of drowning victims require hospital treatment. If the drowning victim is rescued as soon as possible, the subsequent drowning process can be prevented, which means it will not be fatal.
Objective: To determine the challenges of dignosis of drowning death case at Bhayangkara Pusdik Sabhara Porong Hospital in 2021-2022.
Methods: The study used a retrospective descriptive method. The research sample used was medical record data for drowning victims examined at Bhayangkara Pusdik Sabhara Porong Hospital in 2021-2022.
Results: The study sample consisted of 5 dead bodies. The autopsy findings of drowning victims are cadaveric spasm, the sign of asphyxia, froth in the mouth/nose, abrasion, washerwoman's hands, enlarged lungs, Paltauf's spots, and froth in the airways.
Conclusion: The challenges of diagnosing drowning death case at Bhayangkara Pusdik Sabhara Porong Hospital are mostly the dead bodies found in decomposed stage and unavailability of laboratory data. The diagnosis of drowning based on the results of the examination of signs of asphyxia, cadaveric spasm, and mostly froth was found in the respiratory tract.

Introduction

Drowning is death caused by fluid aspiration into the breath due to the immersion of all or part of the body into the liquid. In contrast, near drowning is a condition when the physiological disturbance of the body occurs due to drowning but does not cause death. In other

studies, it is also stated that serum electrolyte imbalance affects heart function (cardiac reflex) and can also be caused by laryngospasm due to vagal reflexes (Schilling & Bortolin, 2012).

According to the World Health Organization (WHO), about 0.7% of deaths worldwide, or 500,000 deaths worldwide each year, are caused by drowning. Drowning is the leading cause of death worldwide in boys aged 5-14. In the United States, drowning is the second leading cause of accidental death among children ages 1 to 4 years, with an average death rate of 3 per 1000 people. Based on the latest definition from WHO in 2002, drowning is a process of respiratory distress caused by submersion or immersion in liquid. Most drowning victims who drink only a small amount of water usually get better on their own. Less than 6% of drowning victims require hospital treatment. If the drowning victim is rescued as soon as possible, the subsequent drowning process can be prevented, which means it will not be fatal (Szpilman, 2012).

In general, drowning is an accident, either direct or unintentional, such as drowning in a drunk victim, under the influence of drugs, or in an epileptic patient. In the case of adult homicide, accidental drowning can occur, i.e., the victim was previously abused, and the victim fainted. However, the perpetrator thought the victim was dead, and to eliminate traces, the victim was thrown into the river, so he died by drowning. Suicide by drowning is also an event that occurs several times (Singh et al., 2015).

Drowning cases have many challenges, when proven by a forensic pathology approach, in determining the cause and manner of death of the corpse. In determining the manner of death, coordinated consideration is required of the circumstances suspected in the death. The available objective medical evidence and some confirmatory data can be sought through external examination, although not specific. Internal examinations and crime scene examinations can help determine how drowning victims' bodies died.

Autopsy Findings

1. External Inspection
    a. There is no pathognomonic sign for drowning; its function is only to strengthen.
    b. Only a few findings confirm the diagnosis of drowning, among others: wet, cold, and pale skin.
    c. Bruises are usually *cyanotic*, except when the water is freezing, the bruising will be pink.
    d. Sometimes, *cutis anserina (Goose flesh)* is on the arms, thighs, and shoulders. This is because the cold

water temperature causes contraction of the *m.errector pilorum.*

e. Fine white froth in the mouth and nose, sticky nature (thick & frothy liquid).
f. Sometimes, there is a cadaveric spasm in the hands, and dirt can be grasped.
g. If someone stays in the water for a long time, the skin on the palms of the hands and feet will wrinkle *(Washer women's hands)* and become pale *(bleached)* (Soekry, 2012).

2. Internal Inspections
   a. Airway filled with froth, sometimes found mud, sand, water grass, diatoms, and others.
   b. The pleura may be reddish, and there may be bleeding spots due to compression of the inter-alveolar septum or due to a convulsive phase due to lack of oxygen
   c. The lungs are enlarged, congested, and have a marbled appearance, so the right heart and large veins are dilated. If the lungs are still fresh, sometimes it can be distinguished whether it is submerged in freshwater or saltwater (Soekry, 2012).

3. Laboratory Examination
   a. Diatom Examination

Diatoms are single-celled algae (algae) with cell walls made of heat-resistant silicates and strong acids. Diatoms can be found in freshwater, seawater, river water, well water, and air. Diatoms and other plankton enter the respiratory or digestive tract when a drowning person swallows water. Then the diatoms will enter the bloodstream through damaged capillary walls while the victim is still alive and spread throughout the tissues. On the other hand, if a corpse is submerged in water, even though diatoms can enter the lungs passively, no circulating blood flow is possible, so (theoretically) diatoms cannot be found in the larger internal organs. far. Examination of diatoms was carried out on the lung tissue of fresh corpses. When the corpse decomposes, diatoms are examined from kidney tissue, skeletal muscle, or femur bone marrow. Examining diatoms in the liver and spleen is less meaningful because it comes from abnormal absorption from the digestive tract of drinking water or food. Examination of diatoms with the destruction method (acid digestion) in the lungs is carried out by taking 100 grams from the peripheral lung tissue. Then put it in a

Kjeldahl flask, and add concentrated sulfuric acid until the lung tissue is submerged; let it stand for about half a day so that the tissue is destroyed. Then heated in a fume hood while concentrated nitric acid was added until a clear liquid was formed, cooled, and spun in a centrifuge (Nur M, Mayatuti; Ramadhani, Farah Nishfi; Sakarisa, Shanti Andri; W, 2015).

The sediment formed was added with distilled water, re-spun and finally viewed with a microscope. The diatom examination is positive if there are many diatoms found in lung tissue, 4-5/LPB or per 10-20 per one preparation, or only one is found in the bone marrow. In addition, pulmonary sap can be examined by flushing the surface of the lung with clean water, then slicing the periphery. Then take a little juice from the peripheral lung tissue, put it on an object glass, cover it with a cover slip, and look at it with a microscope. Apart from diatoms, algae or other types of plants can also be seen. According to Simpson, the diatom test is sometimes negative, even when submerged in diatom-rich water. There have been many false positives that are said to have occurred for technical reasons; therefore, the test is so unreliable that this technique should be used. Moreover, the results are interpreted by considering other circumstances (Nur M, Mayatuti; Ramadhani, Farah Nishfi; Sakarisa, Shanti Andri; W, 2015).

4. Electrolyte and Blood Tests

According to Gettler, in cases of drowning in fresh water, serum chloride levels in the blood from the left heart are lower than in the right heart. Meanwhile, drowning in salt water happens the other way around. In addition, another test, the Durlacher test, can also be used to determine the diagnosis in addition to the Gettler test. The Durlacher test determines the difference in plasma specific gravity of the right and left hearts. If on examination, it is found that the specific gravity of the left heart is higher than the right heart, it can be assumed that the victim died from drowning. Differences in electrolyte levels of more than 10% can support the diagnosis, although separately, it is less significant (Nur M, Mayatuti; Ramadhani, Farah Nishfi; Sakarisa, Shanti Andri; W, 2015).

When fresh water enters the lungs, plasma sodium falls and plasma potassium increases, whereas in salt water inhalation, plasma sodium rises

moderately and potassium increases only mildly. Thus, in victims who died in salt water, the serum sodium concentration in the blood from the right ventricle was lower than that of the left ventricle. Meanwhile, in freshwater drowning, the serum sodium concentration in the blood from the left ventricle is lower than that of the right ventricle. However, this figure can vary because when the postmortem begins, the diffusion of fluids can change the actual level of sodium and potassium. Therefore Simpson argues that analysis of the levels of Na, Cl, and Mg has been used, but the results are too diverse to be used in daily practice (Nur M, Mayatuti; Ramadhani, Farah Nishfi; Sakarisa, Shanti Andri; W, 2015).

Methods

The study used a retrospective descriptive method. The research sample used was medical record data for drowning victims examined at the Bhayangkara Pusdik Sabhara Porong Hospital in 2021-2022. The sampling method used is total sampling.

Result and Discussion

From the study sample, which consisted of 5 bodies, the autopsy findings of drowning victims were based on gender, age, cadaveric spasm, signs of asphyxia, froth in the mouth/nose, abrasions, washerwoman's hands, enlarged lungs, Paltauf's spots, and froth in the airways, which can be seen in the following table:

Table 1. Autopsy Findings on Drowning Cases in Bhayangkara Pusdik Sabhara Porong 2021-2022

No	Examination		Frequency	Precentage
1.	Sex	Male	5	100%
		Female	0	0%
2.	Age	20-40 year old	1	20%
		40-60 year old	3	60%
		>60 year old	1	20%
3.	Dead body condition	Fresh	2	40%
		Decomposed	3	60%
4.	Cadaveric Spasm	Yes	5	100%
		No	0	0%
5.	Asphyxia Sign	Yes	5	100%
		No	0	0%
6.	Froth aorund Nostril and Mouth	Yes	2	40%
		No	3	60%
7.	Froth in upper and lower airways	Yes	4	80%
		No	1	20%
8.	Congestion	Yes	2	40%
		No	3	60%
9.	Washerwoman's Hand	Yes	1	20%
		No	4	80%
10.	Paltauf's Spot	Yes	1	20%
		No	4	80%
11.	Trauma	Yes	1	20%
		No	4	80%

In a study conducted by Wulur, the distribution of drowning cases by sex, it was found that more men died from drowning, as many as 12 cases (80%), compared to women with only 3 cases (20%). These results follow data from the World Health Organization (WHO), the National Safe Kids Campaign (NSKC), and the Centers for Disease Control and Prevention (CDC), which states that men experience drowning more often than women. The data obtained from the results of the study that the authors obtained from medical records were in accordance with the research conducted by Wulur; as many as 5 (100%) cases recorded were male. This could be because men are

more often exposed to water and risky behaviors such as swimming alone, drinking alcohol before swimming alone, and boating (Wulur, 2013).

From the data on the distribution of drowning cases by age group, Wulur's research found that most cases occurred at the age of 20, around 86.67%. This result is also in accordance with statistical data from the Centers for Disease Control and Prevention (CDC), which states that drowning increases in adulthood. The data obtained from the results of the study that the authors obtained from medical records were in accordance with the research conducted by Wulur; as many as 5 (100%) cases were recorded at the age of 20. This can be because the adult group has a broader scope of activity, in contrast to children and adolescents who are still under supervision and the scope of their activities is still limited. Alcohol is also one of the causes of drowning in adults. About 30-50% of drowning cases in adults are found in a drunken state. Locations on the coast are a risk factor for drowning (Wulur, 2013).

Signs of cadaveric spasms will be difficult to see when the body is in a state of decomposition. The decay process was caused by the old victim's body being found. So that at the time of examination, the corpse was already in a state of decay. A cadaveric spasm is an intravital sign that occurs when the victim tries to save himself by holding anything, such as grass or other objects in the water, or abrasions on the elbows, fingers, knees, and feet due to friction of objects in the water. Signs of cadaveric spasm were only found in 1 case (6.67%) in the study conducted by Wulur. The data obtained from the study results that the authors obtained from medical records were slightly different from the research conducted by Wulur, namely as many as 5 (100%) cases recorded experiencing Cadaveric spasms. This is a sign that the victim is trying to save himself by holding anything, such as grass, branches, stones, or other objects, in the water (Wulur, 2013).

Asphyxia is generally defined as a lack of oxygen, either partial (hypoxia) or complete (anoxia). In the event of drowning, asphyxia signs were found with a percentage of 100%. Asphyxia is divided into three major classifications: suffocation, strangulation, and chemical asphyxia. In the classification of suffocation, there is environmental suffocation, smothering, choking, drowning, mechanical asphyxia, gagging, and gas suffocation. Meanwhile, there are manual strangulation, ligature strangulation, and hanging in strangulation. The data from the research results that the authors obtained from medical records are similar to the research conducted by Putri, namely 5 (100%) of the 5 cases recorded as having asphyxia (Agung & Anom, n.d.;

Hussein, N. Haidar; Abdulla, 2019). The classic signs are:

1. Tardieu's spot (Petechial Haemorrhages)
2. Congestion and Oedema
   a. A vascular dam causes the accumulation of blood in the organs.
   b. Venous dams increase intravascular hydrostatic pressure, which causes the seepage of plasma fluid into the interstitial space, and edema occurs.
3. Cyanosis is when the fingers, nails, and lips appear bluish due to a lack of oxygen in the blood.

In a study conducted in Baghdad, based on an external examination of the corpse, most cases were found with froth in the mouth and airways area, 95%. In Indonesia, the finding of froth was 26.67%. On the body also found the presence of fine white froth coming out of both nostrils and mouth. Froth is produced from air, mucus, and aspirated fluid shaken during vigorous respiratory effort. This signifies that the victim is still alive while in the water.

On internal examination, the upper airways filled with fine white froth until the airways branched (carina) and came out of both lungs without pressure. The froth that comes out in the form of lung edema fluid contains exudate, protein, and surfactant mixed with water from the media where the victim drowned. Usually white, sometimes red or pink, because it mixes with blood due to intrapulmonary bleeding. Froth is scattered from the trachea, main bronchi, and smaller airways. The data obtained from the study results that the authors obtained from medical records differed slightly from the research conducted by Putri; namely, only 2 (40%) of the 5 cases had froth. This can occur in dry drowning, where the amount of water that enters is minimal, or the victim dies shortly after entering the water.

In Hussein's study, 54 (90%) of the 60 drowning cases could be found Washerwoman's hands. The data obtained from the research results that the authors obtained from medical records are slightly different from the research conducted by Hussein, in which is only 1 (20%) of the 5 cases recorded as having Washerwoman's hands (Hussein & Abdulla, 2019).

Another study conducted by Wulur, in line with the results found in the study, found that 2 (13.3%) of 15 cases experienced Washerwoman's hands. This may be because signs such as Washerwoman's hands are difficult to evaluate if the body is in a decomposed state. The decay process was caused because the old victim's body was found, so at the time of examination, the corpse was already in a state of decay (Wulur, 2013). In addition, according to Hussein, some of the bodies did not show these signs because they were pulled out of the water immediately after drowning or because of

the low temperature of the water. This is because Washerwoman's hands are a sign of prolonged immersion often observed in women who use water for a long time in the kitchen or bathroom (Hussein & Abdulla, 2019).

In accordance with research conducted in Belgium, a study by Hussein found emphysema, edema, increased lung weight, and pleural effusion in drowning cases as much as 100%. Enlarged lungs in drowning bodies are caused by edema and lung congestion. The data obtained from the study results that the authors obtained from medical records differed slightly from the research conducted by Hussein; namely, only 2 (40%) of the 5 cases recorded had enlarged lungs. This is because the possibility of enlarged lung data is not recorded in the victim's medical record (Putra, 2012; Hussein & Abdulla, 2019).

According to research conducted in Baghdad, the most drowned bodies found paltauf spots by 100% on internal examination. These patches, known as Paltauf's spots, are bleeding spots that result from increased pressure leading to rupture of the alveolar walls. It is often found on the anterior surface and border of the lung but can also be found in the subpleural space if there has been further perforation or rupture. The data obtained from the study results that the authors obtained from medical records differed slightly from the research conducted by Putri; namely, only 1 (20%) of the 5 cases recorded had a paltauf spot. This is due to the possibility of spot paltauf data not being recorded in the victim's medical record (Putra, 2012; Putri, 2021).

In a study conducted in Baghdad, based on external examination of the bodies, most cases were found with froth in the mouth and respiratory tract area. In contrast, in Manado, Indonesia, drowning bodies found froth only at 26.67%. Froth formation is due to fluid entry into the respiratory tract, stimulating mucus formation. When mixed with water and surfactant from the lungs, this substance is shaken due to intense breathing effort. This indicates that the victim is still alive when in the water. The data obtained from the results of the study that the authors obtained from medical records were in accordance with the research conducted by Putri, in which 4 (80%) of the 5 cases recorded that there was froth in the respiratory tract (Putri, 2021; Wulur, 2013).

Signs of violence can occur when the victim tries to save himself by holding anything, such as grass or other objects, in the water, while abrasions can occur on the elbows, fingers, knees, and feet due to friction of objects in the water. The percentage of abrasions in drowning victims is 86.67%, based on research conducted by Wulur. The data obtained

from the study results that the authors obtained from medical records differed slightly from the research conducted by Wulur; only 1 (20%) of the 5 cases recorded had injuries. This is because the possibility of data on the occurrence of injuries is not recorded in the victim's medical record (Wulur, 2013).

Conclusion

Drowning is a form of suffocation in which the victim is immersed in water/liquid, and the object is sucked into the airway to the alveoli and lungs. When drowning occurs, the whole body does not always go into the water, but if the nostrils and mouth are below the surface, it is sufficient to meet the criteria as a drowning event. The challenges of diagnosing drowning death case at Bhayangkara Pusdik Sabhara Porong Hospital are mostly the dead bodies found in decomposed stage and unavailability of laboratory data. The diagnosis of drowning based on the results of the examination of signs of asphyxia, cadaveric spasm, and mostly froth was found in the respiratory tract.

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Profile of Road Traffic Accident Victims Admitted at Bhayangkara Pusdik Sabhara Porong Hospital

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ABSTRACT

Background: Traffic accidents are a health problem in forensic medicine that often occurs in society and needs attention, mainly because it is still a major problem in implementing road transportation in Indonesia. Traffic accidents increase yearly along with the increasing number of road users and the ease of ownership of transportation facilities. In 2012, the death toll from traffic accidents in Indonesia was 29,544, with a case fatality rate (CFR) of 14.95%. In 2013, the victims died from traffic accidents, namely 26,416 people, with a case fatality rate (CFR) of 15.98%. In 2014 the victims died due to traffic accidents, namely 28,297 people with a case fatality rate (CFR), traffic accidents of 17.16%. In 2015 the victim died due to traffic accidents, namely 26,185 people with a *case fatality rate* (CFR) traffic accident of 15.37%.
Objective: To describe profile of road traffic accident victims admitted at Bhayangkara Pusdik Sabhara Porong Hospital in 2021-2022.
Methods: This research is a retrospective descriptive study. The research sample used was medical record data of traffic accident patients examined at Bhayangkara Pusdik Sabhara Porong Hospital in 2021-2022.
Result: The incidence of traffic accidents at Bhayangkara Pusdik Sabhara Porong Hospital can be described as follows; 71.4% are male. Thirteen people (37.1%) are aged 15-29 and based on where the most occurrences on the Surabaya-Malang highway, there are ten people (28.6%), and then based on the time of the incident where the most happened at 12.00 – 18.00, namely 12 people (34.2%), based on the position of the victim where the most were as motorists. Motorcycles have as many as 26 people (74.3%), and based on the type of injury where the most were abrasions is 24 people (40%).
Conclusion: The description of the incidence of traffic accidents at the Bhayangkara Pusdik Sabhara Porong Hospital in 2021-2022 is mainly experienced by men of productive age. It occurred on the Surabaya-Malang highway, which has a heavy traffic flow; the time of the incident was during working hours, position the victim was a motorcyclist, and the most common types of injuries were blunt force trauma.

Introduction

Traffic is a facility for moving objects or people from one place to another. Traffic can have a direct or indirect positive impact on the economy, education, tourism, and health. In addition to having a positive impact on mobilization, there are also unwanted negative impacts, such as congestion, increased air pollution, and traffic accidents (Ministry of Health Republic of Indonesia, 2017). Traffic accidents are a health problem in forensic medicine that often occur in society and need special attention because they have still become a major problem in implementing road transportation in Indonesia. Traffic accidents increase yearly along with the increasing number of road users and the ease of ownership of transportation facilities.

According to the World Health Organization (WHO) 2018, in every year There are 1.35 million people die due to traffic accidents around the world. Every 24 seconds, one person loses his life on streets worldwide. Meanwhile, according to the Ministry of Health of the Republic of Indonesia, Indonesia (RI) 2017, in Indonesia, an average of three people die every hour due to road accidents. A large number of accidents is caused by several things, namely: 61% are caused by human factors, 9% are caused by factors vehicles, and environmental factors and infrastructure cause 30% (Handoko, 2018; Indonesia Statisic Center, 2018).

In 2012, the death toll from traffic accidents in Indonesia was 29,544, with a case fatality rate (CFR) of 14.95%. In 2013 the victim died due to traffic accidents, namely 26,416 people, with a case fatality rate (CFR) of 15.98%. In 2014 the victims died due to traffic accidents, namely 28,297 people, with a case fatality rate (CFR) of traffic accidents of 17.16%. In 2015 the victims died from traffic accidents, namely 26,185 people, with a case fatality rate (CFR) of traffic accidents of 15.37%. (Indonesia Statisic Center, 2018).

Based on data from the Sidoarjo Police Traffic Unit, accidents that occurred throughout 2018 were more serious than the previous year. The vehicles involved in the accident are still dominated by motorcycles. Throughout 2018, there were 1,518 accidents in Delta City. An increase of 4.98 percent compared to 2017, which counted 1,446 accidents. The death toll also rose by 5.33 percent. From 244 victims in accidents throughout 2017, it increased to 257 in 2018 (Taufik, 2019).

From the results of a survey conducted by researchers on September 8, 2022, at the Bhayangkara Pusdik Sabhara Porong Hospital, the Medical Record section. There were 41 victims of traffic accidents who were taken to the Bhayangkara Pusdik Sabhara Porong

Hospital in 2021-2022. Based on the above background, researchers are interested in researching the description of events in traffic accident victims at Bhayangkara Pusdik Sabhara Porong Hospital in 2021-2022.

Methods

This research was conducted in the Forensic Medicine section of the Bhayangkara Pusdik Sabhara Porong Hospital from August 2021 to August 2022. The study used a descriptive method using a retrospective method. The research sample used was medical record data of traffic accident patients examined at Bhayangkara Pusdik Sabhara Porong Hospital in 2021-2022, which met the inclusion and exclusion criteria. The sampling method used is simple random sampling.

Result and Discussion

The number of patients who were victims of traffic accidents brought to the Bhayangkara Pusdik Sabhara Porong Hospital in 2021-2022 who met the inclusion criteria and did not enter the exclusion criteria was 35 samples. From the research sample, which consisted of 35 patients, the description of patients who died in traffic accidents based on gender, age, time of occurrence, and type of injury was obtained as follows:

Table 1. Frequency Distribution By Sex

Sex	Frequency	Presentation (%)
Male	25	71,4
Female	10	28,6
Total	35	100.00

Table 2. Frequency Distribution By Age

Age	Freq	Precentage (%)
0-4 year old	0	
5-14 year old	6	17,2
15-29 year old	13	37,1
30-44 year old	6	17,2
45-59 year old	9	25,7
>60 year old	1	2,8
Total	35	100.00

Table 3. Frequency Distribution by Time of Occurrence

Time of Occurence	Freq	Precentage (%)
00.00 – 06.00	8	22,9
06.00 – 12.00	9	25,7
12.00 – 18.00	12	34,2
18.00 – 00.00	6	17,2
Total	35	100.00

Table 4. Frequency Distribution by Place of Occurrence

Place of Occurence	Freq	Precentage (%)
Road way	35	
Surabaya - Malang	10	28,6
Surabaya - Banyuwangi	6	17,2
Gempol	4	11,4
Porong	3	8,5
Pasuruan	2	5,7
Others	10	28,6
Alley	0	0
Total	35	100.00

Table 5. Frequency Distribution by Victim Position

Victim Position	Freq	Precentage (%)
Passenger	6	17,2
Motorbike Driver	26	74,3
Car Driver	0	0
Pedestrian	3	8,5
Total	35	100.00

Table 6. Frequency Distribution by Wound Type

Wound Type	Passenger	Pedestrian	Motorbike Driver	Total	Precentage (%)
Bruises	4	0	10	14	23,3
Abrasions	4	2	18	24	40
Abraded	1	1	14	16	26,7
Fracture	1	1	4	6	10

A traffic accident risk factor is a potentially dangerous condition that can trigger disease in a certain person or group. Three main risk factors can cause traffic accidents, namely humans, vehicles, and the environment (physical & socio-economic environment) (Ministry of Health Republic of Indonesia. 2016; Mohammed, 2019).

Human Risk Factor

It is divided into three parts (Ministry of Health Republic of Indonesia, 2016); Inherent risk factors, namely risk factors that any interference cannot identify with the individual, such as age, gender, and genetics; Behavioral risk factors are the behavior of drivers who are at risk for injury due to KLLD, such as, not wearing personal protective equipment (PPE), using mobile phones, driving at high speeds, smoking, consuming alcohol and drugs (amphetamine); Drivers conditions/ diseases include fatigue, drowsiness, musculoskeletal disorders, hearing loss, visual impairment, epilepsy, hypertension, and diabetes.

Vehicle and Socio-Economic Factors

People, especially those living in low- and middle-income countries, generally have two or three-wheeled vehicles compared to those with four or more wheels. These vehicles are usually used for work or other family purposes. In contrast to the condition of people in developed countries, they prefer to drive four-wheeled vehicles for family needs and two-wheeled vehicles for leisure or recreational activities. This condition is influenced by the community's socio-economic status, especially related to the income of the community in general (Sharma, 2008; Mohammed, 2019). In 2013, there were more than 104.2 million motorized vehicles in Indonesia. Users of two-wheeled and three-wheeled vehicles reach 81% more when compared to people who use four-wheeled vehicles, which are only around 10%. The rests are heavy truck and bus users. This number continues to increase yearly to reach more than 138.5 million motor vehicles in 2017, with a growth rate of around 7.40% annually. With a large number of two-wheeled motorized vehicles, this condition significantly impacts the high number of high-traffic accidents and deaths caused by these accidents. More than 60% of the total traffic accidents in Indonesia in 2013 were related to two-wheeled vehicles. This percentage increased significantly in the following year, reaching 71% or 108,883 cases of the total traffic accidents in 2014 (Kirono, 2014; The Association of South East Asia Nation, 2016).

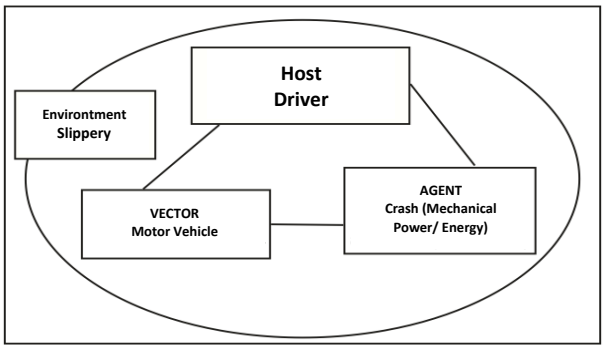
Environtment Factor

Environmental factors significantly influence the occurrence of traffic accidents and result in increased mortality (mortality rate) and disability (Disability-Adjusted Life Years). An increase in the number of motorized vehicles without being followed by an increase in transportation infrastructures such as roads, traffic lights at every intersection, and particular roads for pedestrians and bicycles will cause significant problems for the plan to reduce

the number of traffic accidents. Based on the 2018 Central Statistics Agency report, the increase in road infrastructure until 2017 reached 539,353 km. Meanwhile, the number of vehicles reached more than 118.9 million in 2017, and more than 6 million vehicles have increased since 2016. This condition is a particular problem for the increase in traffic accidents (Indonesia Statisic Center, 2018; Mohammed, 2019).

Mechanism of Accident

Based on the epidemiological point of view, an accident is an event as a result of the interaction between three components, namely: agent (cause), host (recipient), and environment (environment) (Ministry of Health Republic of Indonesia, 2016).



Picture 1. Interaction Scheme of 3 Traffic Accident Components (Ministry of Health Republic of Indonesia. 2016)

1. Agent

In particular diseases, especially infectious diseases, the cause can be a single bacterium (agent). It is different from accidents; it found a little difficulty because of several factors involved in determining the occurrence of accidents (multiple). In traffic accidents, the causes can lie in: (1) the condition of the road, (2) the condition of the vehicle, (3) the driver of the vehicle, and so on. Injury or death coincides with the accident or within a short time.

2. Host

A host is a person who suffers injury or death in an accident. Host factors are intrinsic elements that affect susceptibility to the cause (agent). To determine which hosts are vulnerable, it is necessary to examine the characteristics of the hosts, such as age, gender, education, occupation, and others. There is a marked difference in the form of an accident that befalls a person.

3. Environtment

The environment describes the state of the environment at the scene. "Environmental" factors are extrinsic elements that influence the occurrence of accidents. In "environmental factors," apart from physical factors (weather, lighting, road conditions, and others), some include socio-cultural environmental factors.

Injuries in Traffic Accidents

Most traffic accidents cause trauma due to blunt force violence. Hard and blunt objects can cause various types of trauma (Iwan, 2017; Idries, 2011; Mohammed, 2019), including:

1. Bruises (Contusion)

   Bruises are a wound characterized by tissue damage without any discontinuity of the skin surface. The damage is caused by capillary rupture so that blood flows out and seeps into the surrounding tissue. Bruises are not only on the skin but may also be found in internal organs, such as the lungs, heart, brain, and muscles (Iwan, 2017).

   One form of bruising that can provide information about the shape of a blunt object is "marginal hemorrhages." For example, if the victim's body is run over by a vehicle tire, where there is pressure, it does not show abnormalities. The bleeding will pull over to form a bleeding edge that matches the shape of the gap between the two edges of the tire.

2. Abrasions

   Scratches are wounds caused by damage or detachment of the outer layer of the skin. The characteristics are irregular wound shape, sometimes minor bleeding, the surface covered by crusts (a serum that has dried), and reddish-brown color. On microscopic examination, some parts are still covered by epithelium and tissue reaction (inflammation).

   In the case of a traffic accident where a vehicle tire runs over the victim's body, the abrasions pressed on the victim's body are often the prints of the vehicle's tires. The prints, especially if the tires are still in good condition, where the "blossoms" of the tires are still more pronounced, for example, parallel zigzag shape. Thus, in a hit-and-run case, information on the characteristics contained in the victim's body is very useful in the investigation.

3. Open Wound

   An open or torn wound is caused by contact with a blunt object with force capable of tearing the entire layer of skin and underlying tissue, with the following characteristics: The shape of the wound boundary line is irregular, and the edges of the wound are uneven. Because some of the tissue was destroyed), the wound cliffs were uneven, and there were tissue bridges around the wound boundary lines and bruises found.

4. Fractures

   The hardness of a blunt object is strong enough to cause fractures. The presence of fractures can be detected if there are signs: There are deformities

compared to normal, There is a difference in length, primarily when it occurs in the limbs, When moved, hear a creaking sound (crepitus), The pattern of fractures that occur depends on the location of the fracture. Skull bone fractures often occur in the form of impression fractures; namely, parts of the bone are broken and pushed into. These skull bone fractures can result in bleeding in the skull cavity in the form of epidural, subdural, or subarachnoid hemorrhage and damage to the lining of the brain and brain tissue.

In the case of a traffic accident, fractures that occur can provide information on the direction of the vehicle that hits the victim's leg. When hit from behind, the broken bone will be pushed forward and can tear the muscles and skin in the front leg area. The opposite happens when the victim is hit from the front. Thus, based on the nature of the fracture, it can be estimated where the violence came from and hit the victim's body. This is necessary for reconstructing events other than injuries from blunt objects. Some injuries in traffic accidents can also be caused by sharp objects, such as cuts caused by a tip—motorcycle license plate. Wounds caused by violence by objects that break easily, such as broken car windows, the only injuries found are abrasions and cuts because the windshield is deliberately designed so that if it breaks, it will break down into small pieces. Burns can also occur during an explosion following an accident or minor burns due to contact with high-temperature vehicle parts, such as exhaust (Ramadhani, 2019; Bezabih, 2021).

This study shows that there are more male victims of accidents than women. The results of this study are supported by other studies where men are the most victims of accidents compared to women, with a total of 101 male victims (Yandi, 2020). The same study was conducted by Putra *et al.*, which found that the male gender dominated traffic accident victims. Men as many as 64 people (Putra, 2022). The thing that causes men to experience more traffic accidents is that the highest level of work activity is in the male sex, so they have a higher risk of traffic accidents. In addition to the activity level, other factors, such as having a riskier lifestyle, such as consuming alcohol and smoking while driving, interferes with the driver's focus in traffic (Ratu, 2021). Men, while driving, tend to show emotional characteristics such as irritability, impatience, desire to drive fast and aggressively, and ignoring danger (Putra, 2022).

Based on age, the results of this study indicate that accident victims aged 15-29 years are the most common age group who become victims of traffic accidents. The results of this study are supported by other studies where young adults are the most victims of accidents compared to other ages, with a total of 102,881 people in the 16-25 year age group and 343,743 people in the 26-30 year age group.20 The same study was conducted by Putra *et. al,*. They found that the traffic accident victims were dominated by the age group 15-29 years, as many as 43 people or 44.8% of the total number of accident victims during 2018-2019 at the General Hospital H. A. Thalib Kerinci (Putra, 2022). The number of victims from the age group is young adults because the mobility of the early adult age group is higher than that of other age groups. According to data analysis conducted by the Directorate General of Land Transportation, drivers aged 16-30 years have the most traffic accidents. Early adulthood is a productive age group that has higher mobility compared to other age groups (Putra, 2022; Herawati, 2019).

Based on the incident's time, this study's results were similar to the research conducted by Herawati, 2019. where most accidents occurred at 06.00-12.00 and 12.00-18.00, each of which was 31%. These hours are the morning, afternoon, and evening peak hours. This result indicates that the denser the road traffic, the more accidents that occur, or the quieter the traffic, the less the chance of accidents (Herawati, 2019). This is also in accordance with research conducted by Saputra, 2017 where the results of data analysis on accidents On highways, it is recorded that most accidents occur in the period of 00.00–06.00 (early morning), which is 17%, while another 22% of accidents occur at 06.00-12.00 (morning), and the period during the day is 12.00-18.00. by 44%, and at 18.00-24.00 (night) which is 17%. If observed, most road traffic accidents occur at 12.00-18.00, as many as 44% of cases, because that time is a busy/productive time for road traffic in Indonesia (Saputra, 2017). In 2020, Yandi's research shows that traffic accidents traffic based on several characteristics, namely the day of the incident (33 victims on Sundays) and the time of the incident (34 victims from 6 am to 2 am). According to Vara *et al*., 2021 traffic accidents often occur during the day with a period of 12.00-18.00 due to decreased body stamina due to fatigue doing activities in the morning (Yandi, 2020; Vara, 2021).

Based on the location of the incident, in this study, it was found that

the location of the most frequent accidents was on the Surabaya-Malang road. This is supported by research conducted by Maisaroh, 2021, where Jalan Raya Surabaya - Malang is one of the roads in East Java province which is prone to accidents with its status as a national road. This route is one of the links between Surabaya, which is the center of economic and socio-cultural activities. In East Java Malang, the area is known as one of the main tourist destinations in East Java. Therefore, many residents outside Surabaya or Malang came in droves. This has an impact on the concentration of activity in both cities. Activities that enter the city of Surabaya or Malang impact increasing road users. This factor can encourage the growth of transportation facilities and infrastructure to support meeting these needs, and if not balanced adequately, it will cause accidents.

This study found that the most victims were motorcycle riders, namely 26 people (74.3%). Several previous studies have also obtained similar results. In the results of Riskesdas in 2018, it was found that the cause of injury in traffic accidents often occurs in motorcycle riders (Susanti, 2021). In Indonesia, there is an increase in motorcycle users, and many motorcycle riders drive their vehicles carelessly. The increase in motorcycle users can be caused by poor public transportation (Mohammed, 2019). Another study stated that young motorcycle drivers have risky behaviors, including the habit of driving at high speed, drinking alcohol, desire to seek sensation, and lack of experience controlling the vehicle. Uncontrolled emotions also influence risky driving habits. Based on statistical reports in many countries, the causes of traffic accidents are aggressive behavior of drivers, stress, emotional instability, depression, and insecurity while driving (Susanti, 2021).

The four groups' most common types of injuries were abrasions, with 24 wounds (60%), and the least common was fractured, with six wounds (15%). The results of this study are supported by several other studies, which also show that abrasions are a type of wound often found in traffic accidents. In a study by Putra *et, al.*, about the Overview of Wound Patterns in Traffic Accident Cases at the Mayjen H. A. Thalib Kerinci Hospital for the 2018-2019 period, the results of the most frequent type of wound were abrasions (Putra, 2022). Another study by Indriani and Yulianti explained that Most wounds are abrasions. Another study in India also explained that abrasions were the most

common injuries in traffic accidents (Ambade, 2021).

This is because abrasions occur more quickly than other types of wounds, where abrasions are formed due to displacement of the superficial skin epithelial layer due to friction against a rough surface. Meanwhile, other types of wounds require more energy to cause bodily injury than the energy needed to cause abrasions. Scratches are often found in motorcycle accidents because when falling from a motorcycle, the rider is usually dragged by the repulsive force between two objects; it can be due to friction between the road surface, clothing, and skin, causing abrasions to the affected body part. Motorcycle accident victims generally experience more than one injury, either from the type of injury or the location of the injury. Pedestrian abrasions are often found due to the tracking of blunt objects and being dragged due to collisions with vehicles (Putra, 2022).

The most common abrasions in traffic accidents are sliding abrasions. Shear abrasions are caused by direct pressure on the skin accompanied by a sliding motion. Shear abrasions can determine the direction of the cause of violence, where the first part that slides touches the blunt object will provide a more even boundary, and when the blunt object leaves the displaced skin, it will have an uneven border. There are scratches on the epidermis that run parallel (Putra, 2022).

Conclusion

The Description of traffic accidents at Bhayangkara Pusdik Sabhara Porong Hospital, based on gender, age, time of occurrence, scene, the position of the victim, and type of injury, are in accordance with the three main risks of traffic accidents. The main risk is human, vehicle, and environmental factors.

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Clinical Forensic Assessment of Victim with Sharp Force Injury (A Case Report)

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ABSTRACT

Background: Violence or trauma committed against living victims can take many different forms, including blunt force, sharp force, or other types of injury. Because sharp weapons are simple to get, violent criminal acts frequently involve them. Homicide, suicide, and accidents can all result in deaths from sharp items.
Objective: This study aims to dtermine the diagnosis wound qualification on the examination on patient in the emergency room of the Bhayangkara H.S. Samsoeri Mertojoso Hospital.
Methods: The method of diagnosis uses a clinical assessment and based on Criminal Code's Criteria.
Results: A 61-year-old male victim with the initials JA who claimed to have experienced sharp force injury was reported. Upon inspection of the victim, an open wound of approximately 3 cm in length, 1 cm in width, and approximately 2 cm in depth was discovered on the outside left upper arm. The patient got wound hecting and medicine to reduce the pain. After that the patient release from hospital.
Conclusion: Wounds on the patient's body are criminally caused injuries that fall under the category of minor abuse, meaning they don't make the victim sick or make it difficult for them to accomplish their jobs.

Introduction

Indonesia is a country based on the law of the rule of law as written in the 1945 Constitution 4th Amendment Article 1 paragraph (3) which reads: "Indonesia is a state of law." This has legal consequences that in the Indonesian state, the implementation of state power in a broad sense must always be based on law. This gives legitimacy and limits the state's authority in regulating and providing societal safety and happiness.

Acts of persecution can endanger the safety of the lives of the public, so this

action is subject to a criminal act based on Article 351 of the Criminal Code;
(1)Persecution is punishable by a maximum imprisonment of two years and eight months or a maximum fine of four thousand five hundred rupiahs; (2) If the act results in serious injury, the guilty person is threatened with a maximum imprisonment of five years; (3) If it results in death, it is punishable by a maximum imprisonment of seven years; (4) Persecution is equated with deliberately damaging health; (5) Attempting to commit this crime is a criminal offense.

During the persecution, the perpetrator's actions can cause harm to the victim. *Wounds* can be defined as tissue discontinuities due to trauma. Injuries can be caused by gunshots, electric currents, contact with sharp objects, contact with blunt objects, chemicals, etc.

In upholding justice for victims of persecution, Visum et Repertum must be made as evidence to be brought to court. Visum et Repertum is a certificate made based on experts' observations and findings, whose results will be addressed to the requesting party for Visum et Repertum.

This article will present cases of abuse against living victims who experienced upper-arm abuse (Pramesti, 2015; Margono, 2016).

Methods

This study was based on examining emergency room patients at Bhayangkara H.S.Samsoeri Mertojoso Hospital Surabaya. The diagnosis uses a clinical assessment based on Criminal Code's Criteria

Case

On August 26, 2022, at 21.30 Local Time (GMT +7), a man came to the IGD Bhayangkara H.S. Samsoeri Mertojoso Surabaya, delivered by the police, was conscious of a wound on his left upper arm that was bleeding. To the police statement, the resident found the victim on the street in a state that was already injured for about an hour and a half. Then coming to the hospital and immediately reported it to the police. The police immediately took the victim to the ER Bhayangkara H.S Samsoeri Mertojoso Hospital Surabaya for an examination.

Result and Discussion

On examination of the wound, an open wound was found on the outer left upper arm, eight centimeters below the top of the shoulder. The shape of the wound is a slit, with a length of 3 cm and a width of approximately 1 cm, and a depth of about 2 cm with blood. The wound has clear boundaries and flat edges, both sharp angles, in the area around the clean wound.

On physical examination, all other body areas were within normal limits. Next, the victim's wound is cleaned, stitched to stop the bleeding, and given treatment.

Injuries from sharp objects are bodily abnormalities caused by contact with sharp-edged and pointed objects or tools so that tissue continuity is damaged/lost. Sharp-edged means it can slice, and pointed-tip means it can stab or tear, such as kitchen knives, broken glass, razor blades, swords, kris, sickles, flaps, daggers, bayonets, and others. To determine the degree of injury is done through a medical assessment by a doctor; in writing the conclusion, visum et repertum generally refers to the language of the articles in the law.

Injuries that do not require treatment or medical intervention and do not interfere with function are classified as first-degree injuries. Bruises and abrasions are generally classified as first-degree injuries. The interpretation of third-degree injuries is based on Article 90 of the Criminal Code regarding serious injuries. Getting an injury that does not give any hope of healing or poses a danger of death, causes loss of one of the five senses, gets severe disability, suffers from paralysis, or impaired thinking power for four years. More weeks, and causes the loss or death of a woman's womb. Meanwhile, for injuries that do not meet the criteria for grades three and one, they are classified as grade 2, namely injuries that cause illness or obstacles to carrying out work or searching for a while." (Safitry, 2013).

Injuries caused by sharp objects have the following characteristics, the edges of the wound are flat, the angle of the wound is sharp, the hair is cut, there are no tissue bridges, and there are no bruises or abrasions around it.

In conducting the examination, recording, and reporting of injuries, it is necessary to photograph the condition of the wound first, then calculate the number of wounds and see where the wound is located. Next, measure the wound for the length; it is done by first closing the two edges of the wound. The depth of the wound is described by mentioning the damage to the organs through which the wound passes. For example, a wound on the abdominal wall, abdominal muscles, and liver tissue as far as 5 cm (not penetrating). Thus we get an idea of the depth of the wound. Next, describe the characteristics of the existing wound; the edges of the wound, the angle of the wound, whether there are any tissue bridges, bruises, or abrasions, whether there are any hairs cut, or if anything is coming out of the hole. The next step is to see if there is a foreign object in the wound and if it is possible to find a foreign object. For example, broken glass, a complete knife, and some of the tips of the knife are severe and left behind, then determine the

intravital of the wound and whether it is lethal (Apuranto, 2003). H., 2012).

Sharp violence can cause several types of injuries, including:

Sliced Wound (Incised Wound)

An *incised wound* is caused by a sharp-edged object or tool that occurs with light pressure and scratches on the body surface. It can be caused by knives, broken glass, razor blades, swords, and cutting zinc. The shape of the iris wound is caused if it is parallel to the direction of the elastic fibers or if the wound muscle is in the form of a slit. If it is perpendicular to the direction of the elastic/muscle, the wound is gaping; if it is tilted to the elastic fiber/muscle, the wound is asymmetrical. The characteristics of an iris wound include the edges and surface of the wound being flat, the angle of the wound being sharp, there being no tissue bridge, and the hair being cut (Apuranto, H., 2012).

Slash Wound (Chop Wound)

A *slash wound* is caused by a heavy object or tool with sharp or somewhat blunt eyes with a swing accompanied by a rather large force. Tools that can cause stab wounds include swords, sickles, axes, and ship propellers. The characteristics of stab wounds are usually prominent in size, and the edges of the wound depend on the weapon's blade, sharp or less sharp (Delabarde, *et. al.,* 2017). The sharper the eye of the weapon used, the flatter the edges of the wound, the angle of the wound depends on the eye of the weapon used and almost always causes damage to the bone, sometimes the body part that is stabbed is cut off, bruises or abrasions can be found around the wound (Apuranto, 2003). H., 2012).

Stab Wound

A *stab wound* is caused by an object/tool with a sharp tip and sharp or blunt edge that occurs with a pressure perpendicular to or oblique to the body surface. These injuries can be caused by daggers, bayonets, swords, kris, sickles, broken glass, and pointed objects with a round/square/triangular cross-section—for example, a file, buffalo horn, and others. The shape of the wound caused depends on the location of the wound and the shape of the tool's cross-section causing the wound. In parenchyma and bone organs, the shape of the stab wound is according to the cross-section of the causative device. On the skin or muscle, if caused by a knife parallel to the elastic/muscle fiber: the wound is like a slit; if the direction is perpendicular to the elastic/muscle fiber, it will form a gaping wound. The wound will be asymmetrical if tilted towards the elastic/muscle fiber. If the wound is caused by a tool in the form of a hook/javelin, the shape of the wound will be

like a slit. If the wound is in the area where the elastic/muscle fibers meet, then the shape of the wound is round (according to the tool's cross-section). If the tool that caused the wound has a triangular or rectangular cross-section, the shape of the wound will resemble a three- or four-legged star.

The characteristics of a stab wound depend on the sharp-edged tool or not. If the tool has a pointed tip and sharp edge, the edges of the wound are flat, and the angle of the wound is sharp; on the blunt side of the tool, the angle of the wound is not sharp; on the sharp side of the tool, the hair is also cut, if the puncture is carried out to the base of the knife, sometimes bruises are found. Around the wound, the size of the wound is greater than the length of the wound.

If the stab wound is caused by suicide; in that case, the characteristics include the location of the wound in an area where vital organs are located and can be reached by the victim's hands. Such as the chest or abdomen; the number of fatal wounds is usually one. Experimental stab wounds were found around the primary wound, clustered and with different depths; no blockage was found; if in an area where there are clothes, the clothes will be removed first; sometimes, the hand holding the weapon experiences a cadaveric spasm.

If a murderer causes the wound, the location of the wound will be in any place; also, in areas that are impossible to reach with one's own hands. There must be a sign of resistance or defense wounds or signs of restraint from the victim that caused a blockage wound; no attempted stab wounds were found (tentative stability) (De-Giorgio, et. al., 2015). In most cases, the stab wound in homicide is only one and deep (Burke, *et. al.*, 2018). Murder can resemble a suicide attempt. The target is an unprotected area of the body, and the chest is often a target because it is close to the attacker and knows the many vital organs in the chest area. Most perpetrators use their right hand (not left-handed) so that the wound is often found on the victim's left side, and most attack from the front (Asser, et. al., 2019).

In this case, the wound was on the outer left upper extremity. Injuries to the upper extremities can occur when the victim tries to defend or protect himself from the attacker (Syarifah & Yudianto, 2017). The location and size of the wound on the person can be interpreted as a form of slash commonly found in parry wounds when someone is trying to protect themselves. The presence of bleeding indicates a wound that affects the blood vessels, so it is necessary to suture the wound.

If the stab wound occurs in the head area, it is almost always a homicide; death is often caused by bleeding and damage to vital organs, namely brain tissue. The shape

of the head wound can help determine the weapon's identity. If the stab wound is in the neck, death can be caused by severing the carotid artery, jugular vein, pharynx, and trachea. Cutting the carotid artery can cause profuse bleeding or can cause a thrombus that can block the cerebral artery. Cutting the jugular vein can cause air embolism that can block the pulmonary artery. A trachea cut can cause the aspiration of blood into the lungs. If the stab wound is in the chest area, it can cause damage to the heart, lungs, prominent veins, or arteries, leading to death. If the location of the stab wound is in the abdomen, it can cause damage to the liver, spleen, stomach, pancreas, kidneys, urinary bladder, and intestines, so it can cause quite a lot of bleeding. If the stab wound is in the extremity area, there are often parry wounds; if the number is large, it can cause death due to bleeding (Apuranto, H., 2012).

Conclusion

In this case, the victim came accompanied by an investigator with an SPVR because of the injuries suspected to be the result of a criminal act. The location of the wound on the upper left arm does not affect vital organs or large blood vessels. It is not the dominant hand for carrying out activities, so the wound is a wound that does not cause disease or obstacles in carrying out work, position, or livelihood. Furthermore, the VeR made by the doctor can be used as evidence in the trial.

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