Porcine DNA in Medicine toward Postpartum Patients from Medical and Islamic Perspectives in Malaysia

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ABSTRACT

Nowadays, the issue of the use of pig resources in medicine is a disputed Halal and Haram study. The widespread social media exposure of medicines containing pork in Malaysia has raised concern among many people, especially postpartum patients, who often be provided with pork-based medicine to prevent blood clots in the body. Most Malaysians still do not know the real action to take when faced with such a scenario. Thus, this study focuses on the purpose and requirements in using porcine DNA in postpartum patients according to the perspective of Medicine and Islam in Malaysia. This research methodology used qualitative methods through a library research approach by reviewing selected articles and interviews with physicians and Fiqh. The data collected were analyzed based on the principles of *Maqasid Al-Shariah* and *Dharurah*. By applying the principle "*al-Darurat Tubih al-Mahzurat*", the results found that porcine DNA in medicine are allowed to use toward postpartum patients in *Dharurat* when there is no other option other than using drugs from haram sources.

1. Introduction

In this era of globalization, issues related to Halal and Haram often arise among Muslims. However, nowadays, several factors need to be reviewed, either remain as Haram or are allowed for certain reasons. But it does not mean that any disputed between Muslims need to exaggerate to the point of disunited them. We should apply a good attitude by listening to people's opinions and only then we can judge the good and the bad (Muhammad Ikraam, 2011). Therefore, this research paper reflexes the empirical findings from the United Nation of Shariah Development Goals which is good health and well-being.

Islam is a "*Syumul*" religion, which complements all aspects of human life. The religion of Islam is taking care of the *Muslims* themselves in terms of their safety in daily life. Islam also provides a wide range of facilities for *Muslims* in all situations that may be detrimental, in particular the safety of *Muslims*. In the religion of Islam, caring for life is included as the second stage in *Maqasid Shariah* because "life" is a right of God that should be protected from any threat of disease, murder and so on. Until then in the case of Islamic assassination, the law enforces *Qisas* towards the killer. Today, issues of *halal* and *haram* among *Muslims* are no longer about food and beverages only, but their status has expanded to include medicines (Ahmad Nuryani, 2015).

Even though Islam encourages its people to seek and to cure disease. However, there are modern medicines that we used today, developed from non-halal sources called Clexane. This issue has been raised doubts among *Muslim* patients and medical expertise especially regards the issue of its use. The use of medicines is one of the methods of treatment to reduce and restore the patient's health. Although there are certain ingredients that sources elements that are contrary to Islamic law used in medicine. In essence, Islam prohibits the use of medicines that contain *haram* sources to treat *Muslim* patients.

Furthermore, the use of medicine is required in the case of *Dharurat*, to save the patient's life. The medicines can be used when there were no other *halal* sources of medicines for the patients in the clinical condition during treatment. An example of a situation regarding this issue, a postpartum patient with cesarean delivery needs treatment to dilute blood patient after childbirth. There is no other safe drug used to dilute the blood other than Clexane even though it contains a source that prohibited in Islam and if the condition of the patient is critical, then the use of the medication is necessary to save the patient. Therefore, the current study aimed to find out the using of DNA porcine in medicine toward postpartum patients according to Islamic and medical perspective in Malaysia.

2. Materials and methods

Generally, the needs of pork gelatin in food are commonly used by any food manufacturing such as marshmallows, yoghurt low calories and chewing gum. But at the same time, DNA porcine also used in medicines especially in the field of pharmacy. However, according to the Islamic perspective as *Muslim,* we cannot take any product containing from an illegal source (haram) in it either from pigs or dogs. But in fact, the medical field needed DNA porcine as one of the positive ways to treat the disease. For instance, women after giving childbirth by Caesarean need to take Clexane which contain DNA porcine, aimed to prevent the blood clots in the body of the patient after giving birth. Hence, this issue discussing the necessity to continue the method by using DNA porcine as medicine or using other methods than using the substance of pork.

Islam, we know that pork is illegal (haram) to eat all parts of the body related to pigs, whether raw or cooked, slaughtered or non-slaughtered, whether for food or equipment such as brushes, shoes, handbags, belts and so on. The fact that pork is illegal is eaten because the pork itself contains parasites and dangerous diseases become a strong base for banning it. However, this reason should be the second reason because the main reason that we are banned from eating pork is because that Allah s.w.t. already ask for it (Abd Rahman, 2010).

The ban on pigs for *Muslims* is very clear based on the holy verses of the Quran in Al-Baqarah 2:173, *He has only forbidden you what dies of itself (carrion) and blood and the flesh of swine, and that which is slaughtered as a sacrifice for others than Allah. But if one is forced by necessity without willful disobedience nor transgressing due limits, then there is no sin on them. Truly, Allah is Oft-Forgiving, Most Merciful.*

The 87th National Fatwa Committee on June 23, 2009, held that Islam forbids the use of medicine from any illegal (haram) sources to cure diseases except in cases where there was no other medicine available from halal sources. Therefore, only take the medicine that is required for the patients to avoid harm (Imelda Balchin, 2017). Based on the holy of the Quran in Al-An'am 6:119,

And why should you not eat of that upon which the name of Allah has been mentioned while He has explained in detail to you what He has forbidden you, excepting that to which you are compelled. And indeed, do many lead (others) astray through their (own) inclinations without knowledge. Indeed, your Lord - He is most knowing of the transgressors.

Because to make an *Ahkam* in medicine, even though the medicine from Haram sources, but we need to consider the "availability" of that medicine. If the medicine from Halal sources is not available in the time of emergency *(Dharurat)*, to save lives *Dharurat* was applying. As stated in *al-Qawaid al-Fiqhiyyah* which is "*al-Darurat Tubih al-Mahzurat*" means that necessity renders all prohibited

things permissible (Ali Haidar, 2003). Secondly, we need to consider the "feasibility" of medicine. *Halal* medicine requires a bureaucratic process and the price became too expensive, and it's almost impossible to find it right away. Therefore, it is considered as no alternative to search.

2.1. Literature Review

The research study title "*Panduan Penggunaan Ubat-Ubatan Yang Mengandungi Unsur Tidak Halal*" provides research about the ways of using medicines that contain *Haram* sources towards *Muslim* patients in the Ministry of Health Malaysia. These researches mentioned very details about the significance of using DNA porcine in medicine towards *Muslim* patients in Malaysia. How the application of the *"Dharurat"* situation can make a Muslim used the medicine that contains Haram sources. However, the author does not mention the details about *al-Qawaid al-Fiqhiyyah* in the needs of using DNA porcine in medicine. Even though we can apply for this medicine in a certain emergency that can bring harm to the patients, but not explain how much the percentage that can be used toward patients (Nor Aziah, 2016).

Based on the research study "*Ubat Dari Sumber Babi dan Pilihan Alternatif*" this research highlighted various medicines from pig sources and other alternative options to replace those medicines containing pork. However, although the author states alternative medicines from *Halal* sources but the author does not specify in details the ways how to obtain *Halal* medicines alternative, is it readily available in Malaysia? Or is it only available overseas? Plus, the author also did not specify mention in details how much of percentage that the patients may use the medicines from Haram sources in emergency or "*Dharurat*" situation (Abd Rahman, 2010).

"*Penggunaan Gelatin Babi Dalam Perubatan: Hukum, Hujah dan Penyelesaian*" research study highlighted that the use of pork gelatin is very broad, it is used in food manufacture because of its elastic properties and easy-to-find resources, including medicinal use. The author also emphasized arguments that prohibited the use of drugs contained in it from an illegal source as Allah s.w.t says in the Holy Quran "He has only forbidden you what dies of itself, and blood, and flesh of swine, and that over which any other than Allah has been invoked; but whoever is driven to necessity, not desiring, nor exceeding the limit, no sin shall be upon him; surely Allah is Forgiving, Merciful" which means that pigs are one of the animals that are categorized as illegal to eat and unclean when touched. But unfortunately, the author does not mention the explanation from a medical perspective. It does not state is there exist any kind of medicine that could replace medicine that contains Haram sources and can it resulted as the same as Haram sources medicine that will not affect the patient that takes those medicine (Muhammad Ikraam, 2011).

According to the research title "The use of porcine-derived low molecular weight heparins in *Muslims*" (Mir Sadat-Ali, 2013), they reinterpret that it is one of the prime duty of surgeons and doctors to inform *Muslim* patients and getting their consent before using any kind of medicines that derived from porcine DNA to them. Plus, the author added the use of porcine DNA only can be used in an emergency that can affect the life of patients with the purpose to save lives. However, this research focuses on Saudi Arabia only, while doctors and surgeons in Malaysia already applying the procedure to obtain consent from patients before giving any kind of medicine to *Muslim* patients.

In the article "Heparin and low-molecular-weight heparin" (Elaine Gray, 2008), the authors stressed the comparison of effectiveness between the medicine that contains porcine DNA (Clexane) and without porcine (Heparin). They believe that the potential of Clexane is greater than Heparin in term of convenient and less bleeding toward postpartum patients. It is also reinforced by the argument of the research studies that found a greater improvement in effectiveness in the prevention of blood clots (Pulmonary Embolism). However, the authors do not explain precisely the ineffectiveness of unfractionated heparin to strengthen the point that claims Clexane much better than Heparin.

2.2. Metodology

To complete this study, several Qualitative methodology designs have been used, namely, Library Research and interviews. Researchers have discussed these aspects with emphasis on these techniques.

This study uses library research by reviewing selected journals and articles to see the situation of used drugs by patients after childbirth.

The researcher completed the research through a structured interview with Dr Maizatul Azma, who is an expert in Obstetrics and Gynecology and Associate Prof. Dr Irwan Mohd Subri, who is an expert in Halal Issues and academician of Universiti Sains Islam Malaysia. This interview aims to get the views of experts in taking the law both from the point of view of Medicine and Islam to the relevant patients who use these drugs.

The results of data collection from library research and interviews were analyzed using Maqasid Syariah and Emergency principles to produce the legal position required by Shariah.

3. Results and Discussion

3.1. Porcine DNA in Medicine

Historically, Porcine insulin is obtained from the pig pancreas. A porcine skin graft is one in which pigskin is used, such as in the surgical treatment of burns or other serious skin injuries. Porcine came from the Latin words "*Porcus*" which means "pig" and related to swine (William C. Shiel Jr., 2018).

In Oxford Dictionary Porcine means affecting, or resembling a pig or pigs. While, DNA means Deoxyribonucleic acid, a self-replicating material that is present in nearly all living organisms as the main constituent of chromosomes. It is the carrier of genetic information. Each molecule of DNA consists of two strands coiled around each other to form a double helix, a structure like a spiral ladder. Each rung of the ladder consists of a pair of chemical groups called bases (of which there are four types), which combine in specific pairs so that the sequence on one strand of the double helix is complementary to that on the other: it is the specific sequence of bases which constitutes the genetic information (Angus Stevenson, 2010).

3.2. The Purpose of Using Porcine DNA in Medicine toward Postpartum Patients

During pregnancy and the postpartum period, women are four times more likely to suffer from Venous Thromboembolism (VTE) than when they are not pregnant. VTE is a condition that has blood clot forms in the deep veins of the leg, arm (known as deep vein thrombosis, DVT) and travels in the circulation and also in the lungs (known as Pulmonary Embolism, PE). Nowadays VTE in pregnancy is the highest cause of maternal mortality. The ranges were between 1 per 1000 deliveries incidence of pulmonary embolism (PE) during pregnancy, and PE right now is a leading cause of maternal mortality in developed countries. The treatment of acute PE in pregnancy routinely relies on the use of low molecular weight heparin (Clexane) admission to the hospital, the patient was probably having normal blood pressure although echocardiographic signs of right ventricular dysfunction were present.

Every year, in Malaysia, 13 or 14 postpartum patients died due to blood clots in the blood vessels of the lungs (Pulmonary Embolism). In hundreds of per cent (100%) maternal deaths in Malaysia, 60% were caused by pulmonary embolism (Ciurzyński M, 2011).

Table 1: Direct causes of maternal deaths in Malaysia 2008-2014

CAUSES OF MATERNAL DEATHS (MALAYSIA)	2009		2010		2011		2012		2013		2014	
	n	MMR	N	MMR	n	MMR	n	MMR	n	MMR	n	MMR
Pulmonary Embolism	13	2.6	15	3.1	10	2.0	14	2.7	13	2.6	15	2.9
Amniotic fluid embolism	10	2.0	15	3.1	6	1.2	9	1.7	9	1.8	9	1.8
PPH	20	10.5	13	2.6	19	3.7	15	2.9	14	2.8	15	2.9
Hypertensive Disorders in Pregnancy	18	13.7	25	5.1	25	4.9	19	3.6	11	2.2	12	2.3
Obstetric Trauma	4	5.4	10	2.0	12	2.3	4	0.8	5	1.0	6	1.2

Source: Family Health Division, MOH Malaysia, 2014

In 7 of 10 which is 73% of maternal deaths due to pulmonary embolism occur after birth and only 3% of 10% occur before birth. Besides that, only 9% in 10% which is 90% of maternal deaths due to pulmonary embolism occur after Caesarean surgery and after the patients return to their homes (Family Health Division, 2014).

Pregnant women and postpartum mother are at higher risk of blood clots than non-pregnant women. This is because the pregnant mother's hormones stimulate the body to produce more blood-protein that will condense the blood. The main purpose is to protect the postpartum mother from excessive bloodshed after giving birth. This blood pressure is the reason why pregnant women are at risk 6 times higher to get blood clots than those women who are not pregnant.

The same situation also applies to postpartum patients, because women during pregnancy often having blood thicker than usual. Blood volume is a term that used to the blood in the circulation volume to measure in litres. Blood volume increases gradually by thirty per cent to fifty per cent in the pregnant woman, so by full-term pregnant women has about 1.5 litres more blood than before they get pregnant. A higher circulating blood volume is required to provide extra blood flow through the placenta; therefore, nutrients and oxygen can be delivered to the fetus (Imelda Balchin, 2017).

The increase in blood volume is caused by two changes; firstly, a rise in the volume of blood plasma which increase the fluid part of the blood. Secondly, an increase in the circulation of red blood cells number. The volume of blood plasma increases after about the sixth week of pregnancy. It reaches its maximum level of approximately fifty per cent above non-pregnant values by the second trimester and maintains until full term.

The total red cells volume in the circulation growth by about eighteen per cent during pregnancy, due to the extra oxygen requirements made by the maternal, the placental and fetal tissues. Red blood cells contain the oxygen-carrying substance called hemoglobin. The high hemoglobin levels may cause the body to make too many red blood cells, causing the blood to be thicker than usual. This can lead to clots, heart attacks, and strokes.

That is the reason why postpartum patients had higher blood concentration until the next 6th week and the risk of developing blood clots is 5 times higher after childbirth compared to the situation before birth. This is due to changes in the water content of the blood vessels after birth which causes blood to become condensed. The highest risk is in the first three weeks after postpartum. Therefore, postpartum patients need a blood thinner after childbirth to reduce and prevent the blood clots in the body or else it will become a serious lifelong condition that can be fatal if it is not treated (Maizatul Azma, 2019).

3.3. Types Of Medicines Used To Postpartum Patients In Malaysia

Low-molecular-weight heparin (LMWH) is a class of anticoagulant medications that have been used to prevent blood clots and treatment of venous thromboembolism (VTE) or it also called deep vein thrombosis and pulmonary embolism. Because every year, in Malaysia, 13 or 14 postpartum patients died due to blood clots in the blood vessels of the lungs (Pulmonary Embolism). In a hundred per cent of maternal deaths in Malaysia, 60% of the maternal deaths were caused by pulmonary embolism.

Therefore, the blood-thinning medicine that has been mostly used on women after childbirth in Malaysia consist of three types. Firstly, basic anticoagulant which is Unfractionated Heparin. Secondly, Fondaparinux (Arixtra) made from the synthetic and specific inhibitor of activated Factor X (Xa) and the third one was in the category with LMWH which is Enoxaparin (Clexane)

a. Heparin

Heparin is an anticoagulant (blood thinner) that prevents the formation of blood clots and treat blood clots in the lungs or legs. It is also called Unfractionated Heparin (UFH) which used to prevent and treat blood clots caused by certain medical conditions or medical procedures. Heparin is free from Haram sources which do not contain any porcine in it. Heparin used during blood transfusions, during dialysis when collecting blood samples, when a person is unable to move for a long time and before doing surgery to reduce the risk of blood clots specifically toward postpartum patients. Heparin also helps to keep blood flowing smoothly by making a certain natural substance in the body (anti-clotting protein) to work better.

Furthermore, Heparin function as a fast-acting blood thinner and prevent blood clots in the body. It works together with a natural protein in the body which is antithrombin to block blood clot formation in the patient's body. Specifically, Unfractionated Heparin binds to antithrombin and have the ability to prevent two of the body's most potent clotting factors (factor Xa and factor IIa) within a few minutes (Abdul Rashid Abdul Rahman, 2013). Unfractionated Heparin derived from natural sources which are mainly porcine intestine or bovine lung can be administered originally to prevent thrombosis (clotting or local coagulation of the blood in a part of the circulatory system). Therefore, the effects of unfractionated heparin are more unpredictable than Low molecular weight heparin (LMWH) which is Clexane (Garcia DA, 2012).

Clexane can be given subcutaneously and does not require activated partial thromboplastin time (APTT) monitoring, not like unfractionated heparin which need frequent blood tests to ensure correct dosage for the patient. Besides that, Clexane permits outpatient treatment of conditions such as deep vein thrombosis or pulmonary embolism that previously was sent to the hospital for unfractionated heparin administration. Because Clexane has a more predictable anticoagulant effect and pharmacokinetics. That is why Clexane was recommended over unfractionated heparin for patients with pulmonary embolism (PE) and deep vein thrombosis (VTE). Compared to placebo or no intervention, a treatment designed to prevent a disease from occurring for medical patients using Clexane and similar anticoagulants reduces the risk of venous thromboembolism, especially pulmonary embolism (Douketis JD, 2008).

Fig. 1 Heparin

Fig. 2 Arixtra

b. Arixtra

Arixtra is also known as fondaparinux is a synthetic anticoagulant that makes up the minimal antithrombin (AT) based on the Penta saccharide sequence which binding area of heparin. Even though it is similar to Clexane, which is an indirect inhibitor of factor Xa, but does not inhibit thrombin at all. While compared to heparin, Arixtra has a longer half-life than heparin and does not interact with platelets, but both of which may be useful in certain settings (Kenneth A Bauer, 2019).

The active substance in Arixtra is fondaparinux sodium, which is the sodium salt of a sulphated pentasaccharide molecule and it is in contrast to its animal-sourced competitors which are unfractionated heparin (UFH) and low molecular weight heparin (LMWH) or in Malaysia using Clexane in LMWH category. However, Arixtra is manufactured totally by chemical synthesis without using any basis from an animal source. It was presented with the primary container which is a single dose syringe consisting of a glass barrel with a stainless-steel needle and a rubber needle shield and closed with a plunger stopper (European Medicines Agency, 2008)

In Malaysia, Arixtra was produced by GlaxoSmithKline Farmaseutikal Sdn Bhd company with a registered number under the Ministry of Health Malaysia (MOH) MAL07081508A (Abd Rahman, 2010). As medical professional, they will provide the best treatment and solution to save the lives of patients. In Arixtra (Fondaparinux) issue, even though the blood thinner claim to have no Haram sources, but the study clearly shows that Clexane use is twice as good in terms of quality, efficacy and safety in patients as Arixtra and Heparin. Plus, the cost of getting Arixtra is much higher than Clexane and Arixtra (Fondaparinux) has not been proved and not suitable to be effective toward postpartum and pregnancy use (Peters RJ, 2008).

Besides that, the care and monitoring of patients given Arixtra are also very complicated, whether the patients being hospitalized or even when they were allowed to return home. Both of these situations still need monitoring from medical professional due to afraid that the effect of blood thinner become worse can lead to severe bleeding toward post-partum patients especially with c-section delivery (Maizatul Azma, 2019).

c. Clexane

Clexane is one of the low molecular weight heparin (LMWH) and known as Enoxaparin Sodium. Most of the LMWH like Enoxaparin sodium, Dalteparin, Nadroparin, Bemiparin, and Tinzaparin were also based on porcine derived. However, mostly in Malaysia only using Clexane in the LMWH category as a blood thinner toward postpartum patients. But it still depends on the patient's condition. Clexane is derived directly from porcine intestinal mucosa which obtained by alkaline depolymerization of heparin benzyl ester.

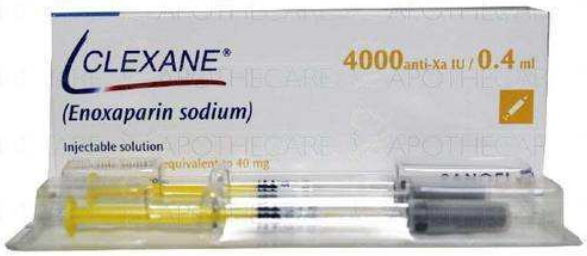

Fig. 3 Clexane

Both Arixtra and Heparin does not have any issue because it is not containing pig elements in both medicines. But the elements used in the initial process of Clexane manufacture is containing pig elements. However, many research studies that clearly show the effectiveness of using Enoxaparin (Clexane) is ten times better in terms of quality, efficacy and safety for patients nowadays (Irwan Mohd Subri, 2019).

Today, there is no comparable medicine like Clexane in terms of its effectiveness to prevent blood clots in veins and body toward women after childbirth. Plus, it also can reduce the maternal mortality rate that causes by venous thromboembolism (VTE) and Pulmonary Embolism (PE). There is no other alternative to cure and prevent blood clots other than Clexane, even though there have other medicines such as Heparin but quality, efficacy and safety in patients were not as good as Clexane. Other than that, the care and monitoring of patients given Arixtra and Heparin medications are more complicated, either when they being hospitalized and when they return home. Both of these situations still need monitoring from a Medical expert (Maizatul Azma, 2019).

Therefore, even though Clexane is based on porcine-derived products, but to save lives and in Dharurat, it may be applied to life-saving situations. With the current availability of synthetic anti-thrombotic drugs in Clexane that can be used to prevent prophylaxis of VTE (Mir Sadat-Ali, 2013).

3.4. Types of Postpartum Patients that Needs Porcine DNA in Medicine

Many types of patients that may be at risk to get blood clots, it is not specific towards postpartum patients with caesarean or normal delivery only. Any people also may be at risk to get blood clots and needs these medicines to prevent blood clots from stopping the flow of blood to the heart, lungs, or brain which can cause death. But women after giving birth, normally experience bleeding and pass some blood clots as the uterus contracts and becomes smaller.

But these medicines are compulsory for all cesarean patients because C-Section raises the risk of postpartum blood clots. Chances highest to four times among those getting emergency cesareans or C-section because it develops many blood clots than women who delivered vaginally. It potentially brings dangerous blood clots in the legs or lungs following childbirth. But, women with normal deliver also may be at risk to have blood clots.

a. Normal Delivery

Normal childbirth is labour that begins spontaneously, basically between 37 and 42 weeks of pregnancy. Normal delivery also means skin-to-skin holding after delivery between the mother and the child, and include breastfeeding within the first hour after delivery. Generally, all women that have low-risk pregnancies are encouraged to proceed with normal childbirth. Elective C-sections are not recommended unless there is a valid medical reason to proceed with the caesarean.

It was a normal situation having blood clots after pregnancy but had too much blood clots or very large blood clots can bring harm and may contribute to Pulmonary Embolism and Venous Thromboembolism. It often happens when the blood does not pass through the vagina immediately and out of the body may form clots. Sometimes these clots can be especially large immediately after giving birth. Therefore, postpartum patients need a Clexane to reduce and prevent blood clots (Rachel Nall, 2017).

Factors that may contribute to blood clots among women with normal delivery as below:

1. Previous Venous thromboembolism (VTE)
2. High-risk thrombophilia (antithrombin, protein C, protein S deficiency)
3. Medical comorbidities (malignancies, cardiac failure, active SLE, IVD U/ TB, nephrotic syndrome, DM with nephropathy, thalassemia major or intermedia post-splenectomy)
4. Obesity BMI above 40kg/m2 and BMI 30-39kg/m2
5. Family history of VTE, Low-risk thrombophilia (Factor V Leiden, High FVIII)
6. Current smoker (up to 10 days)
7. Pre-eclampsia (happen to women during pregnancy)
8. In vitro fertilization (IVF 1st trimester only)
9. Mid cavity/ Rotational instrumental delivery
10. PPH (above 1000mIs) or require a blood transfusion
11. Stillbirth (current)
12. Prolonged labour (up to 24 hours)

If a woman had one or two of these factors, probably will take Clexane which contain DNA porcine to prevent them from having blood clots that will contribute to pulmonary embolism (Maizatul Azma, 2019).

b. Caesarean Delivery

Caesarean delivery or commonly referred to as a cesarean section or C-section, is an extremely safe operation. Most of the serious complications related to cesarean deliveries are not due to the operation itself. Instead, the complications come from the reason for the cesarean delivery.

The most feared complication of cesarean deliveries is the formation of blood clots in the mother's legs or pelvic area. These blood clots can break off and travel to the lungs called a pulmonary embolism. This complication is the leading cause of death among pregnant and postpartum women in most developed countries. Fortunately, the clots usually cause swelling and pain in the legs, and most women bring this to their doctor's attention before the clots travel to the lung. Therefore, if a blood clot is found early, it can be treated with the use of a blood thinner.

Occasionally, there are no warning signs until after the clots have broken off and reached the lungs. Most women recover with treatment, but sometimes the clot can be so large that can affect the life of the mother dies. Unfortunately, there doesn't appear to be a reliable way of avoiding or detecting this condition. Blood clots are more common in the cesarean patient in these three situations. Firstly, the mother is overweight, secondly, the operation was too long or too much complicated. Lastly, the mother has had a long period of bed rest after the operation.

Blood clots were much more common in the past when women were commonly told to remain in bed for weeks after giving birth. Fortunately, they are less common today. Besides that, blood clots are more common toward postpartum patients and pregnant women rather than the person that not pregnant. First, estrogen is produced in large amounts by the placenta. This increases the body's production of clotting proteins. Blood forms must clot quickly after delivery to avoid the bleeding complications above. Second, as the baby grows, the uterus puts pressure on the veins that bring blood back from the mother's legs. This slows blood flow during pregnancy. The combination of

slow blood flow and increased ability to clot leads to a higher risk of clotting complications during pregnancy and after childbirth (Debra Rose Wilson, 2012).

Cesarean patients need to take blood thinner medicine about 10 days after post-partum to prevent blood clots. Moreover, patients with a huge risk to gain blood clots such as patients with overweight and non-balance BMI above 40, need to take Clexane once a day for 6 weeks and Heparin twice a day due to the high risk to gain more blood clots in their veins.

Besides that, another factor that pregnant woman will get during pregnancy is high blood pressure due to hormone changes of a pregnant woman that will make their blood more thick than usual. Even after postpartum, their blood will become thicker and it is natural that their blood to be like that. But when there is a cut on our body (c-section), it will naturally freeze itself because if it does not freeze, then the blood will always come out constantly.

For example, when the skin is cut and broken, your body will form blood clots. Due to this, women with c-section were more exposed to get more blood clots than women with normal delivery, unless women with normal delivery had another contributing factor that can lead to having blood clots such as for overweight (Maizatul Azma, 2019).

3.5. The Expertises' Views in Medical and Islamic Perspective

a. Medical Perspective

Based on a medical perspective, the necessity to use Clexane as a medium to prevent blood clots is very clear and obvious because there are too many cases regarding maternal mortality about venous thromboembolism (VTE) and Pulmonary Embolism (PE) which cause by blood clots in veins and body. For the last 15 years the main factor of maternal mortality due to Hypertensive heart disease of pregnancy but now the main factor is blood clots after childbirth. Hypertensive heart disease refers to heart conditions caused by high blood pressure which is the heart working under increased pressure causes some different heart disorders. Hypertensive heart disease includes heart failure, thickening of the heart muscle, and coronary artery disease. Therefore, we are in an emergency (*Dharurat*) to use Clexane as a medium to prevent maternal mortality because there is no medicine as good as Clexane in effectiveness, quality and safety to patients.

For now, there is no comparable medicine like Clexane in terms of its effectiveness to prevent blood clots in veins and body toward women after childbirth. Plus, it also can reduce the maternal mortality rate that causes by venous thromboembolism (VTE) and Pulmonary Embolism (PE). There is no other alternative to cure and prevent blood clots other than Clexane, even though there have other medicines such as Heparin but quality, efficacy and safety in patients were not as good as Clexane. Other than that, the care and monitoring of patients given Arixtra and Heparin medications are more complicated, either when they being hospitalized and when they return home. Both of these situations still need monitoring from the Doctor.

Besides that, the medicals already tried Arixtra toward patients to replace Clexane, but it is very complicated because it not gives the same result as Clexane and give many risks toward patients that use it (Maizatul Azma, 2019).

b. Islamic Perspective

In Malaysia, they have practised Syafie' schools (*Mazhab Syafie*) and the majority of scholar agreed to say that dogs and pigs are illegal. Therefore, in Malaysia, it is very clear that the banning of these two animals from every aspect in terms of food care, cosmetics and medicines should be free from prohibited elements (*Haram*). However, it needs to be emphasized that the current situation in which

maternal mortality statistics counts for the highest number of cases is due to blood clots (pulmonary embolism). Therefore, to save the life of the maternal mother by giving a blood thinner (Clexane) to prevent the clotting of blood from flowing into the mother's body (Imelda Balchin, 2017).

There are many blood thinners used in post-natal patients such as Heparin, Clexane and Arixtra. However, the most effective drug used for mother after childbirth is Clexane, which is made originally from a pig. It was true that both Arixtra and Heparin medications also serve as blood thinners, but the potential to get risk by using these medications is huge and it requires observing and attention from the Doctor either in the hospital or after being allowed home. Also, the manufacturer of Arixtra itself does not recommend to use this medicine as a blood thinner for postpartum patients. Plus, the cost of Arixtra is two times higher than Clexane. Therefore, today there is no other alternative that can compare the effectiveness of Clexane toward maternal mothers.

The most suitable Islamic legal maxims to use regarding the issue of Clexane is *al-Dharurat Tubih al-Mahzurat* (prohibited things are permissible in *Dharurat* situation). Where in an emergency, *Dharurat* allows Muslim to do things that been prohibited. For example, if in a state of hunger that can lead to death, then it is necessary to eat a pig or dog if it is the only food that exists to survive. In this situation, if there are a blood clots in postpartum patients, it is compulsory to cure with Clexane because if not, it can cause death to the postpartum patients. This is because today there is no other alternative, even Arixtra cannot counteract the effectiveness as the Clexane and will give side effects to postpartum mother that use it.

According to Shariah specialists, pharmacy doctors and O&G (Obstetrics & Gynecology) that have been interviewed. The consultant gynecologist interviewed was 9 people, consist of 6 *Muslims* and 3 *non-Muslims*. Two of the non-Muslim doctors were the head of O&G Malaysia and a representative for the WHO (World Health Organization) while the other was the head of O&G at a Sarawak hospital. It is widely agreed that Clexane is the most effective to prevent blood clots. The widespread blood clots that occur to postpartum patients are included in *Dharurat* situation and cannot use Arixtra as it will contribute to causing harm (Irwan Mohd Subri, 2019).

Furthermore, according to *Qawaid Al-Fiqhiyyah* under *al-Dharurat Tubih al-Mahzurat,* it is also allowed to do things that are prohibited in Islam based on 3 conditions. Firstly, if it really will harm a person if he or she does not do that prohibited things in Islam. Secondly, if there are no other halal drugs that can replace the effectiveness of Clexane. Lastly, can do prohibited things just as much as needed, do not exceed the limit.

This coincides with the doses or injections of Clexane that commonly given to patients. Generally, the doctor will decide how much doses of medicines the patient will receive based on her condition which is the amount of risk of blood clots that she probably got. This depends on the patient condition and also other factors, such as the weight of one patient. Obesity is one of the bigger factors that will make the quantity of medicine became an increase in one patient. For the treatment of blood clots to post-partum, the initial dose should be given approximately 12 hours preoperatively which have formed in the leg or deep vein a dose of Clexane is twice a day 1 milligram or once a day 1.5-milligram body weight injected under the skin (Muhammad Zahruddin, 2017).

Plus, recently a few researchers find out that they could not trace DNA porcine in Clexane because *Istihalah* process that change and transform something from its nature and characteristics (Jamaludin, 2018). For example, when you eat bread, the sewage does not turn out to be bread, but it turns into another form and cannot trace the bread. It completely became another thing and form because it went through many processes and many stages to change. So, does as Clexane, it was transmitted through various stages and cannot detect the original substance that derived from porcine because it is already transformed and change the molecule substance in Clexane.

In general, the Clexane is not made from the original pork. But it is made from the intestines and bacteria of the pig which has been extracted. In simple words, the Clexane has been through the

Istihalah process. However, in Malaysia according to the Syafie' schools (*Mazhab Syafie*) received *Istihalah* in 3 conditions only which are animal skin that has been cleansed (*sertu*). Secondly, blood that turned into milk and thirdly, a wine that turned to vinegar. However, the process of medicine is not included in these 3 conditions. Therefore, taking Clexane was justified because it was in a life-threatening emergency and no other medicine could replace the effectiveness like Clexane.

4. Conclusion

The study shows that medicines derived from porcine DNA help to prevent disease and save the life of postpartum patients from blood clots in the body. For the last 15 years in Malaysia, the main factor of maternal mortality due to Hypertensive heart disease of pregnancy but now the main factor is blood clots in veins and lungs after childbirth known as Pulmonary Embolism (PE) and Venous Thromboembolism (VTE). The result of this blood clots can cause respiratory failure and damage part of the lung due to restricting blood flow. It also decreases oxygen levels in the blood and affects other organs as well. Large or multiple blood clots can be fatal and dangerous. The effect of blockage in the respiratory system can be life-threatening to the person if left untreated.

From a medical perspective, the expert's views that the necessity to use Clexane as a medium to prevent blood clots is very clear and obvious because there are too many cases regarding maternal mortality about venous thromboembolism (VTE) and Pulmonary Embolism (PE) which cause from blood clots in veins and body. There is no other alternative that could replace Clexane even Arixtra itself not gives the same result as Clexane. Therefore, we are in a *Dharurat* situation to use Clexane as a medium to prevent maternal mortality because there is no medicine as good as Clexane in effectiveness, quality and safety to patients.

While the Fiqh experts say by applying Islamic legal maxims *al-Dharurat Tubih al-Mahzurat* (prohibited things are permissible in Dharurat situation). Where in an emergency, *Dharurat* allows *Muslim* to do things that been prohibited. According to the theory of *Maqāsid Al-Shari'ah*, it is compulsory to use Clexane to preserve and protect life (*Hifzu'ala al-Nafs*). Furthermore, the Clexane is not made from the original pork. But it is made from the intestines and bacteria of the pig which has been extracted. In simple words, the Clexane has been through the *Istihalah* process and it is not containing any DNA porcine anymore.

In a nutshell, although various perspectives have been clarified, but hoped that this issue will not be the reason why all *Muslims* should split up and hostile to each other. Because medical experts just give opinions based on their experience in treating patients, Doctors will do anything to cure and reduce the mortality rate in Malaysia. Therefore, Malaysians should be open to each other and have a real discussion about the real issues regarding Clexane and itS *Dharurat* situation to the public for the good of all Malaysians.

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