

# The Differences in Malondialdehyde Levels Between Normal Pregnancy and Abortus

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## ABSTRACT

The background: The world and Indonesia is still recording the high rates of abortus. In midwifery services, abortus is still a problem and a cause of increasing mortality rates, mother's morbidity and newborn baby. One of causes of abortus was the MDA imbalance that occurred during placentation process.

The purpose: The study aimed to determine the difference in levels of Malondialdehyde (MDA) between normal pregnancy and abortus. The Methods: The study design was cross sectional. The research was conducted at Bayangkara Hospital, Padang Hospital, Ibnu Sina Padang Hospital, dr. Rasidin Padang, Andalas Health Center, Biomedical and Biochemical Personnel at Faculty of Medicine of Andalas University in December 2016-February 2017. The sample of the study was 14 pregnant women diagnosed experienced having an abortus and 14 normal 20 weeks pregnant women using contraceptive techniques. Malondialdehyde levels were checked by spectrophotometer method

The Results: The mean of MDA level was  $3.31 \pm 0.59$  nmol/ml in abortus and  $3.71 \pm 1.24$  nmol/ml in normal pregnancy with  $p$  value  $> 0.05$ . The conclusion: There was a tendency towards the role of MDA levels on abortus and normal pregnancy, but it was not statistically significant.

**Keywords:** *Malondialdehyde (MDA), Abortus, Normal Pregnancy*

## 1. INTRODUCTION

Low birth weight babies Abortus was a major complication in pregnancy and a major cause of maternal and fetal morbidity and mortality. The maternal mortality rate caused by abortus was recorded in high level[1] The causes of abortus could be divided into fetal factors and maternal factors: anatomical abnormalities, immunological factors, infections, chronic diseases, endocrine disorders, nutrition, use of drugs and environmental influences[2]. The estimated abortus recorded by WHO was about 40-50 million, as well as 125,000 abortuses per day.[3] It was about 2-2.5% recorded in Indonesia.<sup>4</sup> In 2015, the number of abortuses based on the health profile data of West Sumatra was 3,359 people, this number increased sharply from 2009 as many as 2,123 people. It was recorded that for Padang city, there were 339 abortus cases in 2015 experiencing abortus every year[5] Abortus risk factor analysis was needed to reduce the adverse effects of abortus.

## 2. MATERIALS AND METHODS

The research was conducted in the maternity ward of Bayangkara Hospital in Padang, Ibnu

The risk factors for oxidative stress could increase malondialdehyde (MDA) levels in the incidence of abortus.

MDA level showed the oxidation products of unsaturated fatty acids by free radicals. The increasing of free radicals would cause oxidative stress. The increase in oxidative stress corresponded to an increase in MDA formation. Oxidative stress would cause damage to trophoblast cells which continue towards to be an abortus. MDA is a biomarker of oxidative stress.[6][7]

The study aimed to determine the difference in Malondialdehyde (MDA) levels between the incidence of abortus and normal pregnancy

Sina Hospital, Dr. Reksodiwiryo Padang, RS. Rasidin Padang and Andalas Health Center Padang Biomedical and Biochemical Laboratory, Faculty of

Medicine, Andalas University (FK-Unand) Padang for one year and 6 months starting in December 2016.

The study was a comparative study of two unpaired groups with a cross sectional approach to analyze the mean levels of MDA in aborted mothers and normal pregnancies. The population in the study were pregnant women diagnosed who had had an abortus and normal pregnancies women with gestational age about 20 weeks who were treated in the maternity ward at Padang, RS. dr. Reksodiwiryo Padang, Ibnu Sina Hospital, Padang, RS. Rasidin Padang and Andalas health center Padang with a total sample was 24 samples. Sampling was done by using consecutive sampling technique.

Every pregnant woman (who abortus and normal pregnant) who came to check her pregnancy in there and met the inclusion and exclusion criteria, they were taken as samples. They who met the research requirements would be taken as research subjects and given an explanation prior to

**3. RESULTS**

Table 1. The Average of MDA Level

Variabels	Group		P value
	Abortus (Mean ± SD)	Normal Pregnancy (Mean ± SD)	
MDA Level (nmol/ml)	3,31±0,59	3,71±1,24	0,285

Based on the table above, it could be seen that the mean of MDA level between abortus was slightly lower than normal pregnancy, namely 3.31±0.59 nmol/ml in abortion and 3.71±1.24 nmol/ml in normal pregnancy. The results of statistical tests showed p value 0.05, so there was no significant difference in MDA levels between abortus and normal pregnancy .

**4. DISCUSSION**

The differences in malondialdehyde levels between normal pregnancy and abortus the mean of MDA level on group abortus was 3.31±0.59 nmol/ml, meanwhile 3.71±1.24 nmol/ml in normal pregnancy. The results of statistical tests showed p value > 0.05. It could be said that the result of the study showed that on abortus had inclined lower MDA level than normal pregnancy.

In a cross-sectional study, 50 pregnant women (25 people in each group, namely mothers had a abortus and those did not) were conducted. The result showed that maternal serum MDA levels were

approval about the research to be carried out and if they agreed, they were asked to sign an informed consent form. After that, a 3 cc median cubital venous blood sample was taken. Then the blood was put into a centrifuge tube (vacuum tube) without EDTA by

allowing the syringe handle to bleed automatically from the syringe tube. Then, centrifuge the blood sample at a speed of 2000-3000 rotations per minute (rpm) for 20 minutes in Laboratory Bayangkara Hospital of Padang. Then, the centrifuged serum was stored in the sample cup. After that, the blood was sent to the Biomedical and Biochemical Laboratory, Faculty of Medicine, Andalas University, Padang and stored at a temperature of -20° C or 80° c until the examination was carried out.

ELISA method was used in Examination of MDA levels. The study was carried out after obtaining ethical feasibility from the research ethics committee of the Faculty of Medicine, Andalas University, Padang.

higher in women who had an abortus 3.41±0.42 nmol/ml compared to normal pregnant women 3.24±1.16 p = 0.022.8. This was in line with previous studies which said that there was no significant difference between MDA levels in abortus with normal pregnancy (p=0.68).[9] The results of the study explained that 2.35 of increases in MDA level were found in women who had a abortus, because MDA level increased in pregnancy associated with changes that occurred in maternal and fetal endocrine.<sup>10</sup> Inadequate trophoblast invasion resulting in the formation of trophoblastic oxidative stress caused the relationship between the products of conception and the spiral arteries to not occur completely. Pregnancy experiencing placenta oxidative stress also had implications for the occurrence of abortus.[2][10]

One of the causes of malondialdehyde (MDA) levels in abortus was the increased production of lipid peroxidation which was typically initiated by highly reactive free radicals. Reactive electrophile species caused toxic stress in cells. High serum MDA concentrations indicated an oxidation process in the cell membrane causing endothelial cell damage through either direct

interaction with the endothelial cell membrane or indirectly through the activation of other mediators by lipid peroxidation products.[11]

This would cause the endothelial membrane to leak and molecules up to the size of an enzyme can escape through the damaged membrane causing DNA damage. If the DNA damage that occurred could not be repaired by DNA repair mechanisms, the cell would enter to the apoptotic pathway and cell death occurred, which in the fetal stage, this death would trigger the body's response to expel the products of conception, resulting an abortus.

## 5. CONCLUSION

The average of MDA level in abortus indicated lower rate than in normal pregnancy.

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