

Clinical Overview Of Endometrial Curettage Preparations In Abortion At The Department Of Anatomical Pathology, Faculty Of Medicine, Universitas Sumatera Utara And Anatomical Pathology Unit, Haji Adam Malik Hospital Medan 2021-2022

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Abstract

Backgrounds

Abortion is a condition where the pregnancy ends before the fetus is able to live outside the womb and before the fetus weighs 500 grams or gestational age is less than 20 weeks. Many factors can cause abortion, including age, parity, gestational age, birth history, education level, employment, marital status, economic status, various medical illnesses, nutritional status, pregnancy spacing, embryo abnormalities such as chromosomal abnormalities, damage to the development of placenta or embryo, infection and others.

Methods

This study was a descriptive study with a cross sectional approach on 42 samples from endometrial curettage preparations with *H&E* staining.

Results

In this study, the age of most sufferers was 31-40 years, namely 18 samples (42.9%), the most parity was < 1, 21 samples (50.0%), the most pregnancy interval was > 2 years, 23 samples (54.8 %), the highest gestational age 11-15 weeks as many as 22 samples (52.4%), sufferers who had no history of abortion 29 samples (69.0%), no history of diabetes mellitus 42 samples (100.0%), no history of hypertension 42 samples (100.0%), history of no infection 31 samples (74.4%), history of unknown smoking, drugs and alcohol 42 samples (100.0%), history of unknown autoimmune disease 42 samples (100.0%), 33 samples (78.6 %) did not undergo beta-hCG examination, 23 samples (54.8%) had incomplete abortions, 19 samples (45.2%) had histopathological diagnosis results.

Conclusion

Based on histopathology, the highest percentages were products of conception (45.2%), molhydatidiform (31.0%), and decidual casts and/or stella arias (23.8%).

Keywords: Abortion; endometrial curettage; patient characteristics

INTRODUCTION

Abortion is a condition where the pregnancy ends before the fetus is able to live outside the womb and before the fetus weighs 500 grams and the gestational age is less than 20 weeks or 5 months and the fetus cannot live outside the womb.^{2,3,4}

The incidence of abortion in the United States in 2020 is around 10-20%, while in Indonesia the incidence of abortion is around 1,280 pregnant women, of which 16% occurs in West Java province, 12% in East Java, North Sumatra 48%. Of the 48% percentage in North Sumatra province, 24% is in Kab. Deli Serdang.^{1,2}

Most of the causes of abortion are not known with certainty, but several influencing factors are growth factors resulting from conception, which can cause fetal death and congenital defects. Impaired growth of the products of conception can occur due to chromosomal factors from the initial meeting of chromosomes, including sex chromosomes. Endometrial environmental factors occur because the endometrium is not ready to accept implantation of the products of conception. Apart from that, poor maternal nutrition due to anemia or too short a pregnancy interval also has an influence, including endometrial infection, conception products influenced by drugs and radiation, psychological factors, maternal habits (smoking, alcohol, drug addiction).³

Factors that influence the occurrence of abortion are age, education level, employment, marital status, economic status. Other health factors that influence are gestational age, parity, history of abortion, pregnancy spacing, nutrition, as well as diseases including embryo abnormalities such as chromosomal abnormalities, damage to the development of the placenta or embryo, infections, cervical incompetence, chemotherapy for cancer, diabetes mellitus, , and hypertension. Based on clinical abortion, it is divided into imminent, incipient, incomplete, complete, missed abortion and habitual abortion, while based on its occurrence, abortion is grouped into spontaneous and artificial abortion.^{1,4,5,6,7}

With the high number of cases of spontaneous abortion, the availability of histopathological examination techniques for the results of conception in failed pregnancies

is an integral component of management. Bleeding and early miscarriage cause problems that must be treated in the first trimester of pregnancy, for histopathological examination to determine the assessment of possible causes of recurrence, miscarriage and determine some unexpected pathological conditions.⁸

METHODS

The design of this research is descriptive research with a cross-sectional approach determine the clinicopathological description of endometrial curettage preparations for abortion in the Department of Anatomic Pathology, Faculty of Medicine, University of North Sumatra and the Anatomic Pathology Unit of H. Adam Malik Hospital, Medan for the 2021-2022 period using paraffin blocks and endometrial curettage histopathology slides that meet the inclusion criteria. The exclusion criteria were that the slide preparations that had been reviewed were dominated by blood components or were not representative so they could not be processed, cut and re-stained.

This study used 42 samples with based on characteristics of age, parity, pregnancy spacing, gestational age, history of abortion/still birth, history of diabetes mellitus, history of hypertension, infection in the mother, history of smoking-drugs-alcohol, history of autoimmune disease (Systemic Lupus Erythematosus (SLE), antiphospholipid syndrome, rhesus abnormalities) and beta-hCG, based on clinical diagnosis it is grouped into 5, namely incomplete, complete, missed abortion, molhydatidiform and blighted ovum and histopathological diagnosis is grouped into 4, namely products of conception, molahidatidiform, blighted ovum and decidual cast and/or stella arias. missed abortion, molhidatidiform and blighted ovum.

RESULTS

Forty-two endometrial curettage samples were obtained in this study. Table 1 shows the distribution of sample characteristics based on age, parity, pregnancy spacing, gestational age, history of abortion/still birth, history of diabetes mellitus, history of hypertension, maternal infection, history of smoking-drugs-alcohol, history of autoimmune

disease (Systemic Lupus Erythematosus (SLE), antiphospholipid syndrome, rhesus disorders) and beta-hCG.

Table 1. Characteristics of abortion patients

Characteristics	N = 42	%
Age		
1 = <20 years	2	4.8
2 = 21-30 years	15	35.7
3 = 31-40 years	18	42.9
4 = > 40 years	7	16.6
Parity		
1 = < 1 x parity	21	50.0
2 = 2 x parity	8	19.0
3 = 3 x parity	9	21.4
4 = > 4 x parity	4	9.6
Pregnancy Spacing		
1= < 2 years	19	45.2
1= > 2 years	23	54.8
Gestational Age		
1 = 5- 10 weeks	20	47.6
2 = 11-15 weeks	22	52.4
3 = 16-20 weeks	0	0
History of Abortion/Still Birth		
1 = None	29	69.0
2 = Abortion 1 x	12	28.6
3 = 2 x abortions	1	2.4
4 = Abortion > 3 x	0	0
History of Diabetes Mellitus		
1= Yes	0	0
2= No	42	100
History of Hypertension		
1= Yes	0	0
2= No	42	100
Maternal Infection		
1= Yes	11	25.6
2= None	31	74.4
Smoking-drug-alcohol history		
1= Yes	0	0
2= None	0	0
3= Don't know	42	100
History of Autoimmune Disease		
1= Yes	0	0
2= None	0	0
3= Don't know	42	100
Beta-hCG examination		
1 = Beta-hCG examination was carried out	9	21.4
2= Beta-hCG examination was not carried out	33	78.6

According to table 1, the age of most sufferers was 31-40 years, namely 18 samples (42.9%), the most parity was < 1, 21 samples (50.0%), the most pregnancy interval was > 2 years, 23 samples (54.8%), the highest gestational age 11-15 weeks as many as 22 samples (52.4%), sufferers who had no history of abortion 29 samples (69.0%), no history of diabetes mellitus 42 samples (100.0%), no history of hypertension 42 samples (100.0%), history of no infection 31 samples (74.4%), history of unknown smoking, drugs and alcohol 42 samples (100.0%), history of unknown autoimmune disease 42 samples (100.0%), 33 samples (78.6%) did not undergo beta-hCG examination.

Table 2. Frequency distribution of sufferers based on clinical diagnosis

Characteristics	N = 42	%
Clinical Diagnosis		
- Incomplete	23	54.8
- Complete	0	0
- Missed abortion	6	14.2
- Hydatidiform mole	13	31.0
- Blighted ovum	0	0

According to table 2, based on the most clinical diagnosis, the incomplete group was 23 samples (54.8%), followed by the molhydatidiform group with 13 samples (31.0%), then missed abortion with 6 samples (14.2%).

Table 3. Frequency distribution of sufferers based on histopathological diagnosis

Characteristics	N = 42	%
Histopathological Diagnosis		
-Results of conception	19	45.2
- Complete, partial, degenerative molhidatidiform hydrophic	13	31.0
- Blighted ovum	0	0
- Decidual cast and/arias Stella	10	23.8

According to table 3, based on histopathological diagnosis, the highest number of products of conception group was 19 samples (45.2%), followed by the molhydatidiform group with 13 samples (31.0%), then deciduous cast and/or stella arias with 10 samples (23.8%).

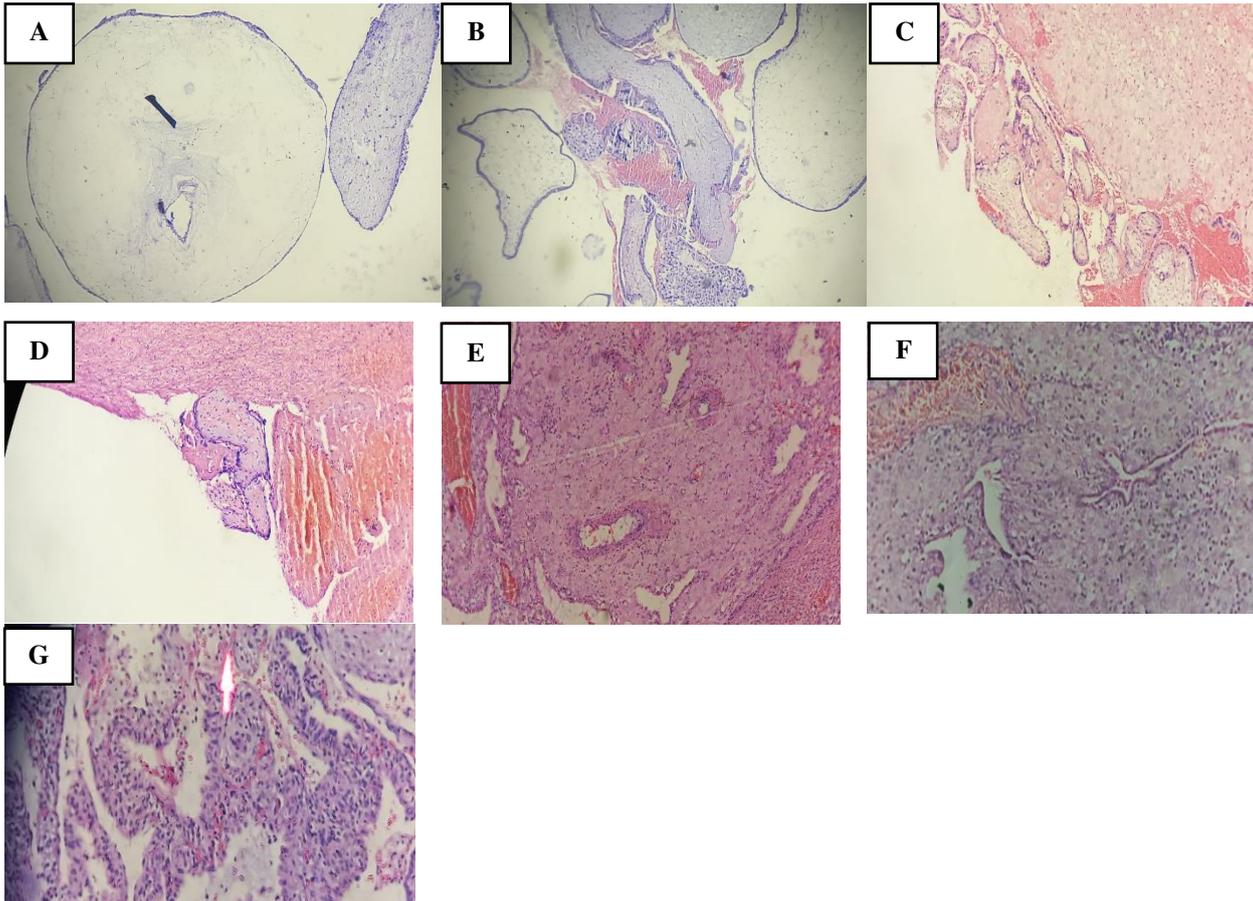


Figure 1. A & B. Molahidatididosa C & D. Products of conception E, F & G . *Decidual cast and/Arias stella*

DISCUSSION

The results of this study show that the largest sample is around the age of 31 years to 40 years with a percentage of 42.9%. Apart from these findings, it was found that 16.6% were over the age of 40 years and 4.8% were under 20 years of age. This is in line with the results of research conducted by Nugraheni et al and Nirma Surya et al where the largest group, with a percentage of 46.87%, was in the age range 31-40 years. 9,10 In several other studies, namely by Lama P et al and Dhruvi, the highest percentage who experience abortion is in the age range of 21-30 years or between 46%-61.2%.^{11,12}

Apart from the above, the factors for abortion can be influenced by the function of the female reproductive system, where if the gestational age is under 20 years, the possibility of abortion will increase by a percentage of around 12%, but on the other hand, if the pregnancy occurs after the age of 35 years, the possibility of complications will occur. bleeding and postpartum accompanied by degenerative diseases will increase with a percentage reaching 26%.^{5,10}

Several studies show that the number of parities is closely related to the occurrence of abortion, where the age range factor also influences the number of parities in the incidence of abortion in pregnancy. In this study, the highest percentage of parity distribution groups who experienced abortion were those with <1 parity (50%) followed by 21.4% in the 3 times parity group, 19% with 2 times parity and 9.6% with 4 times parity. In theory, multiparas and grand multiparas are groups at higher risk of experiencing abortion due to the weakening of the reproductive organs, especially the endometrium of the uterine body due to reduced vascularization, degeneration and necrosis processes. Deterioration of function and reduced vascularization cause infertility in the function of the endometrium in receiving the products of conception, oxygenating the products of conception, and the nutrition needed by the fetus through the circulation of the mother's blood to the fetus. This will cause death and the release of all the products of conception from implantation and will cause stimulation of the uterus and cause contractions resulting in abortion.¹³ The results of this study are in line with research conducted by Lama P et al and Liayuni et al where the highest percentage of abortions occurred in one-time group with an age range of 31-40 years (40.4% and 43.8%)^{11,13}, where research with different results was found by Indra that the most abortions were in the multiparous group (70%).¹⁴

The distribution of pregnancy spacing is also one of the things that influences the occurrence of abortion, where research conducted by Nirma Surya et al found that 61.5% of abortion cases were in women who had children between two and five years between pregnancies.¹⁰ The pregnancy process will take place if there is four conditions that meet

the criteria for pregnancy, namely the presence of ovum, spermatozoa, conception and nidation. However, apart from the above, a pregnancy distance that is too close will increase the risk of abortion and babies with low birth weight, namely < 2,500 grams, followed by fetal and infant death.¹⁰ Research conducted by Wahyuni et al and Yeyen found that the percentage of abortions with a pregnancy distance of less than two year is between 39.1%-61.4%. This study is different in that it was found that the group between pregnancies between two years was only around 45.2%, where the percentage range between pregnancies between less than two years and more than 2 years was 45.2% to 45.8%. This is quite significant when compared with research conducted by Nirma and Yeyen.^{15,16}

A pregnancy is the duration of pregnancy in the number of weeks before birth based on historical data, fetal ultrasound, or neonatal examination. The duration of pregnancy is divided into pregnancy phases, namely the first trimester (0-12 weeks), second trimester (13-28 weeks) and third trimester (29-39 weeks).¹⁷ Several research results found that 50% of spontaneous abortions occurred in first trimester, where the cause of abortion is caused by cytogenetic abnormalities, autosomal trisomy and triploidy, from the results of this study, the highest gestational age distribution group, 52.4%, was at 11-15 weeks of gestation, followed by 47.6% at gestational age. 5-10 weeks. This situation is almost the same as the results of research conducted by Linda Yanti where 35.8% of abortions were found at 10-16 weeks of gestation and 39.2% at 48 weeks of gestation.¹⁷ Risk factors related to gestational age include the presence of abnormality. on ovetal factors, maternal factors, other maternal factors diseases preeclampsia (pregnancy-induced hypertension) and eclampsia, Acquired thrombophilia, diabetes mellitus, maternal anemia, Toxic damage to the placenta, Metabolic storage disorders, Chromosomal abnormalities.¹⁸

The risk factor for abortion is from the maternal side, namely Diabetes Mellitus, where a history of Diabetes Mellitus in this study was not found, so that the overall abortions that occurred were not related to Diabetes Mellitus, although in several studies

hyperglycemia occurred in the first seven weeks of the embryonic phase accompanied by no If there is control over glycemic levels, the risk of recurrent abortion can reach 30-60%.¹⁹ This research shows that 100% is not related to a history of diabetes mellitus, but in research conducted by Laila et al, the percentage of a history of diabetes mellitus was 78%.²³ It was not found. The history of Diabetes Mellitus in this study is also in line with the results of research conducted by Betris and Niken that in some abortions there was no history of Diabetes Mellitus in the 42-58 samples studied. 20,21 Several things related to the occurrence of abortion are level of education, employment , marital status, economic status, but socioeconomic conditions, employment and education are risk factors related to the education and awareness of pregnant women about the problem of abortion. In this research, these factors were not the variables tested.

Other maternal diseases include whether there is a history of hypertension, whether or not there is a history of smoking, drugs and alcohol, and whether there is a history of autoimmune disease. It was found that the percentage of these disease histories was 100% not found. These things include research by Betris that 91.6% of abortions occurred more often in mothers who did not have hypertension, as well as the explanation by Ela Rusidi et al that from the sample studied 83.9% of abortions occurred in mothers with no hypertension. history of hypertension, while in research by Laila et al, 78% of the samples studied occurred in mothers with a history of hypertension.^{22,23,24}

In theory, hypertension is known to cause disturbances in placental blood circulation and abortion. Cardiovascular changes are basically related to increased cardiac afterload due to hypertension, cardiac preload which is significantly influenced by pathological reductions in pregnancy hypervolemia due to hematological changes, impaired renal function and pulmonary edema. The prognosis is always influenced by the complications that accompany the disease. The prognosis for hypertension in pregnancy is always serious. This is the most dangerous disease that can attack pregnant women and their fetuses.²⁵

There are many differences of opinion and outright contradictions regarding the nature

and significance of the lesions seen in various maternal disorders. Hypertension in pregnancy does not reveal a single or specific abnormality in the placenta affected by this condition. In the majority of cases, the placenta shows a low uteroplacental outflow effect. The placenta is smaller than the placenta without pregnancy complications. Infarcts are more common and centrally located. The villi may show cytotrophoblast proliferation, thickening of the trophoblast basement membrane, inconspicuous small fetal capillaries, and prominent villous stroma. The villi show accelerated maturation and are often abnormally small with an increase in syncytial knots (more than 30% of the total villi). The spiral arteries show a lack of adaptive remodeling features. In these women, the second wave of intravascular migration of trophoblasts does not occur. The intramyometrium of the spiral artery segments retains the musculoelastic media and cannot dilate. Spiral arteries show acute necrotizing arteriopathy. This type has also been described in other complications, including other hypertensive placentas, diabetes, systemic lupus erythematosus, and lupus erythematosus antiphospholipid syndrome, and antiphospholipid syndrome. A small group of preeclamptic patients showed large placentas with abundant immature trophoblasts. These patients usually have other causes including diabetes, multiple pregnancies, or hydatidiform mole.¹⁸

Whether there is a history of infection, in this study it was found that 74.4% of the sample percentage did not have an infection, but 26.6% had a history of infection. Infectious diseases that are always found are typhus abdominalis, malaria, syphilis, acute diseases such as pneumonia, pyelonephritis, etc. which can cause abortion. Toxins, bacteria, viruses or plasmodium can pass through the placenta to the fetus, causing fetal death and then abortion. 16,18 Any infection in early pregnancy accompanied by severe maternal systemic disorders, for example lobar pneumonia, can cause abortion without any involvement. directly from the placenta or fetus. However, a number of organisms appear to have specific abortifacient effects, despite producing little or no systemic symptoms in the mother, organisms that are particularly stigmatized in this regard, including rubella

virus, treponema pallidum, listeria monocytogenes cytomegalovirus, toxoplasma gondii, campylobacter sp and an herpes simplex and coxsackie virus.¹⁸

Other conditions related to abortion, namely a history of smoking, drugs and alcohol, a history of autoimmune disease, were not found in the entire sample. Although the results of this study, the percentage of history of infection was only 26.5%, from several studies the characteristics of abortion can be caused by anatomical problems such as cervical incompetence, uterine leiomyoma, massive chronic intervillitis, lymphoplasmacytic, deciduitis, and chronic decidual perivasculitis. This allows for a history of infection in the mother who experiencing an abortion related to infection in the decidua. 82 An increase in infections in pregnant women that are uncontrolled and untreated will cause the percentage of miscarriages to increase in the second trimester with a percentage of 15-66%.²⁶

The next explanation is about whether there is a history of drugs, the results of this study show that of the entire sample studied there was no history of smoking, drugs or alcohol. Although the data obtained did not reveal this history, in theory the consumption of smoking, alcohol and drugs (NAPZA) will cause malformations in the fetus due to the phasoactive effect of inhibiting uteroplacental circulation, reducing hemoglobin levels in pregnant women, endocrine disorders, reproductive hormone disorders, sexual function, menstrual period disorders and abortion.²⁷ For a history of autoimmune disease, the results obtained also showed that the entire study sample was not associated with autoimmune disease. In theory, it is known that autoimmune diseases such as systemic lupus erythematosus, myasthenia gravis, transfer of specific autoantibodies through the placenta can cause fetal or neonatal disease, Obstetric antiphospholipid syndrome (OAS) are some examples of types of autoimmune diseases that can appear in pregnancy and cause miscarriage.^{28, 29}

Beta hCG is the main test for early pregnancy detection and identification if complications are encountered early in pregnancy, the condition of the endometrium during pregnancy will be maintained by beta hCG progesterone levels so that the endometrium

supplies oxygen and nutrients to the fetus through the endometrial spiral arteries so that the pregnancy can be maintained. Production of Beta hCG will occur during fertilization and implantation of the blastocyst to save itself from developing. Apart from that, Beta hCG is also a glycoprotein containing galactose and hyperoxamine produced by the syncytiotrophoblast to prolong the life of the corpus luteum by the developing chorion. This research shows that the percentage of pregnancies that underwent Beta hCG examination was only 21.4%, while 78.6% did not undergo Beta hCG examination. The role of ultrasound and histopathological examination is an examination that can differentiate between types of miscarriage and differentiate types in other conditions.³⁰

Clinically, examination of mothers with cases of abortion can be carried out on a clinical basis. From this study, the results obtained through histopathological examination showed that the highest abortion was the incomplete abortion group, namely 58.5%, followed by molhydatidiform 31%, mised abortion 14.4%, while blighted ovum and complete abortion were not found (0%). This percentage is in line with the research of Kubro et al, Silva et al, namely that the highest group is incomplete abortion with a sample percentage of 47.7% - 93%, as well as Lama P who stated that incomplete abortion was 42.5%. 77.78 On the other hand, Nisa and Kartini found that imminens abortion was the highest group of abortions when compared with other abortions at 44.2%.³³

This research was also carried out based on histopathological diagnosis where based on histopathological diagnosis usually the diagnosis that can be determined consists of the results of complete, partial molahidatidiform conception and with hydropic degeneration apart from these two types the diagnosis can be made through histopathology of abortion curettage tissue where blighted ovum and decidual can be found. cast/arias stella. The description of the results of conception from endometrial fluid tissue is rare, which originates from the meeting of egg and sperm cells and is divided into 3, namely trophoblast villi, implantation and fetal tissue. For diagnostics, it is difficult to identify the results of conception, especially at the beginning of pregnancy, due to the very small scale

in the biopsy specimen if the results of the conception are carried out before curettage. 34 This study shows that the group of results of conception diagnosed histopathologically was 45.2%. Lama P et al found that the histopathological diagnosis of the most correlative samples was 75% as well as by Olayi et al as much as 68.2%. In addition to the results of conception, the frequency of trophoblast villous hydrops involves the chorionic villi during embryonic development. This group of molhydatidiform moles can be differentiated into partial moles (proliferating trophoblasts, villous hydrops, corionic villi) followed by complete molahidatidiforms (trophoblasts proliferating, villous hydrops but without embryo development), the percentage followed by molahidatidiforms in this study was 31%.³⁵

Diagnosis *blighted ovum* found in abortions are usually caused by chromosomal abnormalities which are detected in 85% of abortion cases. A blighted ovum occurs when the egg cell has been fertilized by a sperm cell implanted in the uterus but does not develop in the embryo or when the blighted gestational sac develops normally but the embryo part of the pregnancy is absent/stops growing. Another term for blighted ovum pregnancy is called anembryonic pregnancy. The results of this study did not show any blighted ovum from the samples studied. Another histopathological finding in this study was the presence of decidual casts/stellar arias in 23.8% of which the nuclear decidual cast was the 3rd most common case after conception products 45.2% molhydatid 31.0%. Decidual cast is a change in the endometrial stroma characterized by round stromal cells, large eosinophilic cytoplasm, large round nuclei accompanied by a prominent nucleus, usually almost complete appearance of stella arias, starting from the glands/papillae and cell cytoplasm that is clear, eosinophilic and glycogen, especially hobnail cells. The nuclei appear very atypical and the chromatin is coarse/vesicular. However, the number of mitoses is rare and it is possible to encounter pseudo-inclusion nuclei. Due to limitations in immunohistochemical staining in several studies and bibliography, this condition is always suspected as clear cell carcinoma.^{35, 36, 37} Various opinions in the literature have been

expressed that it can reduce the death rate by histopathological examination of endometrial tissue due to abortion accompanied by clinical symptoms and clinical examination. completeness is very important in reducing cases of mortality in the products of conception.³²

CONCLUSION

In this study, the age of most sufferers was 31-40 years, namely 18 samples (42.9%), the most parity was < 1, 21 samples (50.0%), the most pregnancy interval was > 2 years, 23 samples (54.8 %), the highest gestational age 11-15 weeks as many as 22 samples (52.4%), sufferers who had no history of abortion 29 samples (69.0%), no history of diabetes mellitus 42 samples (100.0%), no history of hypertension 42 samples (100.0%), history of no infection 31 samples (74.4%), history of unknown smoking, drugs and alcohol 42 samples (100.0%), history of unknown autoimmune disease 42 samples (100.0%), 33 samples (78.6 %) did not undergo beta-hCG examination, 23 samples (54.8%) had incomplete abortions, 19 samples (45.2%) had histopathological diagnosis results.

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