ANALYSIS OF PREGNANT WOMEN WITH PLACENTA ACCRETA IN HAJI ADAM MALIK MEDAN HOSPITAL, PERIOD 2017-2019

[1]Ormias Pratama, [1]Sarma N Lumbanraja,[1]Muara P Lubis,[1]Teuku M Ichsan,[1]Elida R Sidabutar,[1]Cut A Adella
[1]Obstetrics and Gynecology Department, Medical Faculty of Universitas Sumatera Utara, RSUP Haji Adam Malik Medan, North Sumatera, Indonesia.

Abstract : Placenta accreta is an abnormal form of placentation in which the chorion villi attaches or invades abnormally through a defect in the basal decidua causing a possible failure of placental detachment from the uterus followed by heavy post-partum hemorrhage.[1] Lately, there has been an increase in the incidence of placenta accreta at Rumah Sakit Umum Pemerintah Haji Adam Malik Medan (RSUP HAM). However, up to now, there are no data on prevalence, patient characteristics, risk factors or management of placenta accreta events in the province of North Sumatra.The design of this study is a descriptive study with a case series design that is women diagnosed with placenta accreta. The research sample is a part of the population that fulfills the inclusion and exclusion criteria. The sample size in this study is 50 patients diagnosed with placenta accreta to be taken with the total sampling technique registered in the medical record of RSUP Haji Adam Malik Medan from May 2017 to June 2019. The total number of patients diagnosed with placenta accreta from May 2017 to June 2019 (2 years) was 50 patients (100%), with the most periods being June 2018-June 2019 totaling 40 patients (90%), then the period May 2017 - May 2018 numbered 10 patients (10%). The total number of patients diagnosed with placenta accreta from May 2017 to June 2019 (2 years) was 50 patients, with the most period being June 2018-June 2019 totaling 40 patients, then the period May 2017-May 2018 amounted to 10 patients. Based on age, 29 samples were aged 20-35 years, with parity, the majority were multigravida by 42 people. Based on gestational age, as many as 31 samples were between 34-37 weeks of pregnancy. For the history of antenatal care (ANC) the majority of samples did in external hospitals as many as 44 people, based on the history of C-section it appears that the majority of 31 samples lived 2 times. 43 samples never experienced abortion. 37 samples underwent Total Abdominal Hysterectomy (TAH) and 13 samples underwent conservative measures. 50 samples gave birth to live infants, while the majority of babies born weighed between 2500-4000 grams as many as 38 babies. Based on the Placenta Accreta Index (PAI) Score, it appears that 22 samples had scores >4-<6. 48 samples underwent elective surgery while only 2 samples underwent emergency surgery. Based on anatomic pathology examination, it appears that 29 samples were placenta accreta, 18 samples were placenta increta and 3 samples were placenta percreta.

Keywords : Placenta accreta, analysis of the incidence, pregnancy.

INTRODUCTION

Placenta accreta is an abnormal form of placentation in which the chorion villi attaches or invades abnormally through a defect in the basal decidua causing a possible failure of placental detachment from the uterus followed by heavy post-partum hemorrhage.[1] The use of the term placenta accreta is often confusing among clinicians, especially when distinguishing placenta accreta from placenta creta, which is caused by the absence of international consensus in nomenclature.[2] Therefore, the term Accreta Placenta Spectrum is often used in a more general discussion.[2]

Placenta accreta is actually a rare complication, where the incidence rate is around 1 in 3.000-5.000 deliveries, however, the incidence is increasing directly proportional to the increase in labor rates in the c-section.[3,4,5] The current incidence rate of placenta accreta in the world ranges from 1 in 540 to birth.[6,7] However, up to now, there is no exact data on the incidence in Indonesia.

The two main risk factors for placenta accreta are placenta previa and a history of previous uterine surgery.[1,8] Cases that cause injury to the uterine wall are important factors, because implantation of the placenta at the site of the previous uterine scar has a high risk of developing placenta accreta. Other risk factors such as hypertension disorders in pregnancy, smoking, pregnancy by means of in vitro fertilization (IVF), and a history of recurrent abortion are factors associated with risk of a higher incidence of placenta accreta.[9]

Placenta accreta is a life-threatening condition in which all or part of the placenta is attached to the uterine wall.[10,11] If there is placenta accreta, there is a possibility of failure to release the placenta from the uterus followed by heavy post-delivery bleeding . Maternal morbidity and mortality rates due to placenta accreta require special attention to health services. Early diagnosis is an important point in reducing the risk of bleeding and maternal death.[12]

Lately, there has been an increase in the incidence of placenta accreta at RSUP HAM. But to date, data have not been found either prevalence, patient characteristics, risk factors or management of the incidence of placenta accreta in the province of North Sumatra. Haji Adam Malik General Hospital was chosen, because RSUP HAM is a referral center hospital in North Sumatra province, so it is expected that patients diagnosed with placenta accreta who came to RSUP HAM can represent the whole picture of placenta accreta patients. By analyzing patient data, cases of placenta accreta were found at Haji Adam Malik General Hospital, so that this data can be used by clinicians to be able to predict patients with high risk factors and be able to prevent and reduce morbidity and mortality rates of pregnant women with placenta accreta.

METHOD

The design of this study is a descriptive study with a case series design that is women diagnosed with placenta accreta. The study was conducted at the RSUP H Adam Malik Medan and conducted in December 2019, placenta accreta medical record data was taken from May 2017 to June 2019 the sample size in this study were 50 patients diagnosed with placenta accreta to be taken with the total sampling data technique.

The data used is the medical record of all obstetric patients enrolled at Haj Adam Malik General Hospital that has met the inclusion and exclusion criteria. The data is then recorded and grouped according to the variables used.

RESULTS

In this study, delivery termination method was found in RSUP. HAM in the period May 2017 to June 2019 with a total of 1082 cases by vaginal delivery totaling 328 cases and 754 cases of operation, of which 754 cases 68 cases were pregnancies with placenta accreta. From 68 samples, 50 samples fulfilled the inclusion criteria which will be explained in the table below and 18 excluded samples were reviewed from incomplete PAI score data and incomplete anatomic pathology data. Of the 18 samples of the exclusion criteria, the highest age group was 25-30 years, with 12 people based on parity. The highest number was multigravida, 12 people. Based on gestational age, the highest age was 34-37 weeks, 13 people, based on the history of antenatal care found the most from outside hospitals with a total of 15 people, based on the history of cesarean section found the most is a history of surgery twice as many as 12 people, based on the history of abortion found the most is with a history of never having abortion with the number 16 people, in terms of management found the most is a hysterectomy group with a total of 16 people, based on the termination plan found the most with an elective plan of 15 people, based on infant outcomes there are 3 dead babies and 15 live babies with the highest birth weight a lot that is 2500-4000gr with 13 babies

Table 1. Number of cases by year diagnosed placenta accreta

Period	Amount (n)	Percentage (%)
May 2017- May 2018	**10**	**10**
June 2018 - June 2019	**40**	**90**
Total	**50**	**100%**

Found that the total number of patients diagnosed with placenta accreta from May 2017-June 2019 (2 years) was 50 patients (100%), with the most periods being June 2018 - June 2019 totaling 40 patients (90%), then the period May 2017 - May 2018 numbered 10 patients (10%).

Table 2. Characteristics of Research Samples

Variable	Amount (n)	Percentage (%)
Age		
<20 years old	**0**	**0**
20 - 35 years old	**29**	**58**
> 35 years old	**21**	**42**
Parity		
Primigravida	**0**	**0**
Secundigravida	**7**	**14**
Multigravida	**42**	**84**
Grandemultigravida	**1**	**2**
Age of Pregnancy		
<34 weeks	**1**	**2**
34 - <37 weeks	**31**	**62**
≥ 37 weeks	**18**	**36**
Antenatal Care		
Hospital Adam Malik	**6**	**12**
Hospital Outside	**44**	**88**
C-Section History		
1x	**15**	**30**
2x	**31**	**62**
≥ 3x	**4**	**8**
Abortion history		
Never	**43**	**86**
1x	**6**	**12**
2x	**1**	**2**
≥ 3x	**0**	**0**
Management		
TAH	**37**	**74**
Conservative	**13**	**26**
Accrual Placenta Index Score		
> 1 - <4	**14**	**28**
> 4 - <6	**22**	**44**
> 6 - 9	**14**	**28**

Termination Plan	**48**	**96**
Elective	**2**	**4**
Emergency		
Histopathology	**29**	**58**
Aceta	**18**	**36**
Increta	**3**	**6**
Percreta		
Weight Infants	**12**	**24**
1000 - <2500 gr	**38**	**76**
2500 - 4000 gr	**0**	**0**
> 4000 gr		
Baby's Condition		
Life	**50**	**100**
Died	**0**	**0**

Found in the characteristics of the age most found is the age group of 20-35 years which amounted to 29 people (58%), then in the age group >35 years totaled 21 people (42%). Based on parity, the most common number found in multigravida was 42 people (84%), and then followed by secundi gravida totaling 7 people (14%) and grandemulti gravida totaling 1 person (2%).

Based on gestational age, the most number was 34-37 weeks gestational age group with 31 people (62%), followed by gestational age group >37 weeks totaling 18 people (36%), and <34 weeks totaling 1 person (2%) .

Based on the Antenatal Care visit list, *it was* found that the most were referrals from outside hospitals totaling 44 people (88%), while those of Haji Adam Malik General Hospital alone consisted of only 6 people (12%). Based on the previous C-Section history , it was found that the most number was with a C-Section history of 2 times with a total of 31 people (62%), followed by a history of C-Section 1 times with a total of 15 people (30%) then with a history of *C- Section* more than 3 times totaling 4 people (8%).

Based on the history of abortion found the most number is the group that has never experienced abortion numbered 43 people (86%), followed by a history of abortion 1 time amounted to 6 people (12%), and history of abortion 2 times amounted to 1 person (2%).Based on the management principle, the management of total abdominal hysterectomy (TAH) was the most numbered in the management of 37 people (74%), followed by conservative management of 13 people (26%).Based on the Placenta Accreta Index score, it was found that the most scores were >4-<6 totaling 22 people (44%), and scores >1-<4 totaling 14 people (28%), scores >6-9 totaling 14 people (28 %).Based on the termination plan, the most patients were found in the elective group with 48 people (96%), while the emergency group numbered 2 people (4%). Based on the type of histopathology examined, the type of placenta accreta was the most with 29 (58%), followed by placenta increta totaling 18 (36%), and placenta percheta 3 (6%).Based on the output of babies born, it was found that the most babies weight was 2500-4000 gram baby weight group with 38 babies (76%), then followed by <2500 gram baby weight with 12 babies (24%), and in the baby's condition those born were found alive as many as 50 babies (100%), none of them died after termination.

DISCUSSION

Placenta accreta is defined as an abnormality of trophoblast invasion in part or the entire placenta in the uterine myometrial wall. The placenta accreta spectrum, formerly known as morbidly adherent placenta, refers to the pathological attachment range of the placenta, including placenta increta, placenta percreta, and placenta accreta. Maternal morbidity and mortality can occur due to massive and sometimes life-threatening bleeding, which often requires blood transfusion.

The maternal mortality rate is increased in women with placenta accreta spectrum. The most common risk factors are placenta previa and a history of previous C-section labor. In a systematic review, the incidence spectrum of placenta accreta increases of 0 , 3 % in women with a history of cesarean deliveries to be 6.74% for women with a history of five or more delivery C-section.[31] In previous studies, it appeared that all patients with a history of C-Section in which as many as 31 samples (62%) went through it twice, followed by 15 people with a history of once (30%) and only 4 samples (8%) who had more than 3 time. In line with the study by Slaoui, where among the 6 cases studied all patients had undergone C-section (100%) with 50% undergoing cesarean section 3 times, 33.3% 2 times and 16.7% only underwent it once. The study shows that the level of incidence of this anomaly increases with the number of a history of C-section before.

Data from this study found 29 people (58%) of samples aged between 20-35 years and 21 people (42%) aged over 35 years, in the study by Slaoui, 4 of the 6 samples studied were over 35 years of age (66.6 %) and the rest between 20-35 years old (33.4%).[32] Analysis univariate shown that women with placenta accreta tend to have an older age, young gestational age and higher gravidity compared with controls (P <0.001). In addition, placenta accreta was identified as being associated with a history of abortion, an injured uterus and a higher frequency of placenta previa (P <0.001).

According to Usta et al, one of the risk factors that cause placenta accreta is placenta previa and maternal age over 35 years.[27] And this is in line with Rambei's study, that placenta previa will occur with increasing age of mothers with more than 30 years of age at risk of experiencing placenta previa 2 , 6 times and developing 3 times greater than in women under the age of 20 years. This is due to an endometrial condition whose vascularization decreases so that blood flow to the endometrium is disrupted.[31] Kionodo also mentioned that increasing maternal age will cause perfusion and infarction of the placenta due to changes in the uterine wall so that changes in placental size cause the growth of the placenta to widen to the lower uterine segment and cover part or all of the internal uterine ostium.[34] This is also in line with Garmi's research, that the median maternal age for placenta accreta is 34 years.[4]

According to Singh et al, multiparity is one of the risk factors that cause placenta accreta. [3] Furthermore, other studies show multivariate regression analysis showing maternal age (OR = 1,268, 95% CI: 1,143-1,406, P <0.001), gravidity (OR = 3,435, 95% CI: 1,413-8,350 for 2 times, P = 0.006 ; or = 9.643, 9 5% CI: 3,901- 23 838 to 3 times, (P <0.001) and the placenta lies low (OR = 15 952, 95% CI: 4701-54127, P <0.001) were independent risk factors for placenta accreta.[35] In line with

this study, it appears that the majority of the sample were multigravida by 42 people (84%) with an average sample of 31 people (62%) at gestational age between 34-37 weeks. However, no clear correlation was found between the occurrence of placenta accreta and the occurrence of multiple abortions (OR = 2,757, 95% CI: 0.679-11.184, P = 0.156), uterine scar (OR = 0.573, 95% CI : 0.184-1.7 88, P = 0.338) and hypertensive disorders (OR = 1.395, 95% CI: 0.368-5291, P = 0.624) which is consistent with this study that the majority of the sample (86%) had never experienced an abortion.[35]

From this research the list of visits Antenatal Care, found that most of the referrals from hospitals outside amounted to 44 (88%), while the patients RSUP HAM alone amounted to only 6 (12%). This is in line with Sofiah et al., The referral system algorithm from placenta accreta itself which must be managed multidisciplinary or a senior team of obstetric specialists, anesthesiologists, and urology team found in tertiary hospitals, therefore patients found in this study are mostly referred from home outside pain.[7]

For the final results, 50 samples (100%) with live births were seen while for the baby's weight the majority of babies with a range of weight between 2500 - 4000 grams were 38 babies (76%) and 12 babies were found to weigh <2500 grams (24%). The discovery of the baby weight <2500 grams in this study are consistent with the study by Zhang shows neonates were born from pregnancies with placenta accreta has a birth weight were significantly lower (3022.27 ± 607.14 vs 3341.09 ± 444.05 control) , 5 minutes Apgar score first low and the incidence of neonatal asphyxia were higher when compared with controls.[36]

The diagnosis is definitive is in histopathology where no finding of cleavage zone between the placenta and myometrium making the delivery becomes difficult and even impossible.[32] When an anatomic pathology examination was performed, it appeared that 29 positive samples of placenta accreta (58%) and the remaining 18 (36%) included placenta increta and 3 (6%) included placenta percreta (42%). In a study by Samosir, found 21 patients with a history of cesarean section, 10 (47.6%) of them were proven histophatologic with an abnormally invasive placenta.[37]

According to Sofiah, the alleged diagnosis of placenta accreta can be made from a combination of ultrasonographic findings and confirmed by clinical and histopathological findings.[7] All patients studied in this study had undergone a hysterectomy and some conservative measures then the diagnosis of placenta accreta was confirmed by histopathological examination.

The first-line management of placenta accreta is hysterectomy, but now with advances in surgical and hemostatic techniques, it increases the prognosis of postpartum hemorrhage and allows clinicians to experiment with conservative treatment. Conservative care must be applied carefully and in an appropriate infrastructure to enable the maintenance of fertility and reduce maternal-fetal morbidity and mortality.[32] In line with this study, management with TAH was prioritized with 37 patients (74%) and only 13 samples with conservative care (26%).

Based on the Natural Sciences Score, it appears that 22 samples (44%) are in scores >4-<6 and the remaining 14 samples (28%) with scores >1-<4 and 14 samples (28%) with scores> 6-9. Placental Accreta Index (PAI) is proposed to predict an individual's risk for placental attachment abnormalities using a 2-D color Doppler sonographic examination. The evaluation system PAI improve diagnostic accuracy by 80 is 3 %. The implementation of the PAI scoring system significantly increased the sensitivity of the ultrasound diagnosis (34% to 60%, p < 0.005). Specificity, positive predictive value (PPV), and Negative Predictive Value (NPV) were also higher using the PAI score of 100%, 100%, 55% respectively. The area under the ROC curve (AUC) of the score IPA to predict placenta accreta is 0.774 in the case without a previous cesarean , and 0,794 with at least one cesarean delivery before, and these results are lower than ever reported before (0.87). PAI score >4 is able to predict 100% abnormalities invasion of the placenta in patients with at least 1 cesarean before.[35] Research by Samosir shows the cores of the AJOG placenta accreta index have a sensitivity of 70%, a specificity of 81.8%, a positive predictive value of 77.8%, a negative predictive value of 75%, and an accuracy of 0.762 to diagnose invasive abnormal placenta.[37]

When classified by type of operation, it appears that 48 samples (96%) underwent elective surgery while only 2 samples (4%) underwent emergency surgery. This is in line with Singh's research, that in the event of placenta accreta it is better to plan elective surgery to prevent other complications that can endanger the mother's condition, namely the amount of bleeding that can occur and adhesions that arise.[3] The algorithm of management systems in Surabaya also suggests that elective surgery is performed at 34-36 weeks' gestation and in a team multidisciplinary approach.[38]

CONCLUSION

The total number of patients diagnosed with placenta accreta from May 2017 to June 2019 (3 years) was 50 patients, with the most period being June 2018-June 2019 totaling 40 patients, then the period May 2017-May 2018 amounted to 10 patients. Based on age, 29 samples were aged 20-35 years, with parity, the majority were multigravida as many as 42 people. Based on gestational age, as many as 31 samples were at gestational age between 34-37 weeks. For the history of antenatal care (ANC) the majority of the sample did it in outside hospitals as many as 44 people, based on the history of the C-section it appears that the majority of 31 samples lived 2 times. 43 samples never experienced abortion. 37 samples underwent Total Abdominal Hysterectomy (TAH) and 13 samples underwent conservative measures. 50 samples gave birth to live infants, while the majority of babies born weighed between 2500-4000 grams of 38 babies. Based on the IPA score, it appears that 22 samples had scores >4-<6. 48 samples underwent elective surgery while only 2 samples underwent emergency surgery. Based on anatomic pathology examination, it appears that 29 samples were placenta accreta, 18 samples were placenta increta and 3 samples were placenta percreta.

.

SUGGESTION

Researchers hope the results of this study can be beneficial for the progress and optimality of diagnosis and treatment in terms of the placenta accreta spectrum, so as to reduce morbidity and mortality rates in pregnant women suffering from placenta previa suspicious of placenta accreta. One of the most important risk factors for placenta accreta is prior C-section history. For this reason, doctors are expected to be able to reduce the number of C-section actions and perform these actions according to clear indications. In addition, the researchers hope that future research can be conducted with a larger sample and more specific characteristics on this topic so that it is expected to perfect this research and provide precise and straightforward information to the public and clinicians.

REFERENCES

[1] Douraghi-Zadeh D, Gay H, Davies C L, Narayanan P. Imaging of Placenta Accreta, Increta and Percreta. European Society of Radiology;1-20.

[2] Jauniaux E, Collins S, Burton G. Placenta accreta spectrum: pathophysiology and evidence-based anatomy for prenatal ultrasound imaging. American Journal of Obstetrics and Gynecology. 2017.

[3] Singh N, Kumari P. Placenta Accreta: A Mini Review. Journal of Pregnancy and Child Health. 2014;01(02).

[4] Garmi G, Salim R. Epidemiology, Etiology, Diagnosis, and Management of Placenta Accreta. Obstetrics and Gynecology International. 2012;2012:1-7.

[5] Nunes C, Carvalho RM, Araujo C, Santo S, Melo A, Graca LM, Diagnosis of Placenta Accreta by Ultrasonography: a "Gold Standard"? Acta Obstet Ginecol Port. 2014;8(2):136-140.

[6] Saraví PG, Patiño NK, Juana ML, Mariano J, Reyna E, Tizzano R. Doppler Ultrasound in the diagnosis of placenta percreta: our experience. Rev. Argent. Radiol. 2014;78(3): 149-155.

[7] Sofiah S, Fung L. Placenta Accreta: Clinical Risk Factors, Accuracy of Antenatal Diagnosis and Effect on Pregnancy Outcome. Med J Malaysia. 2009;64(4):298-302.

[8] Baughman W, Corteville J, Shah R. Placenta Accreta: Spectrum of US and MR Imaging Findings. RadioGraphics. 2008;28(7):1905-1916.

[9] Fitzpatrick KE, Sellers S, Spark P, Kurinczuk JJ, Brocklehurst P, Knight M. Incidence and Risk Factors for Placenta Accreta/Increta/Percreta in the UK: A National Case-Control Study. PLoS ONE. 2012;7(12):e52893.

[10] Arafa A, Stamatis R, Abdel-Aal R, Vanderby A. Placenta Accreta: Challenging Diagnosis and Management. A Case Report and Literature Review. NHS Trust. 2015.

[11] Sentilhes L, Goffinet F, Kayem G. Management of placenta accreta. Acta Obstetricia et Gynecologica Scandinavica. 2013;92(10):1125-34.

[12] Wilches A, Jimenez G P, Abreu J A, Vasquez A, Rumie C, Romero J. Practical Assessment of Diagnosis of Placenta Accreta: Radiologist Perspective. European Society of Radiology. 2014. 1-17.

[13] Morlando M, Sarno L, Napolitano R, Capone A, Tessitore G, Maruotti G, et al. Placenta accreta: incidence and risk factors in an area with a particularly high rate of cesarean section. Acta Obstetricia et Gynecologica Scandinavica. 2013;92(4):457-460.

[14] Cunningham FG, Leveno KJ, Bloom SL, Hauth JC, Rouse DJ, Spong CY. Obstetrical Hemorrhage. In : Williams Obstetrics. 23rd ed. USA:MC Graw Hill, 776-780.

[15] Oyelese Y, Smulian J. Placenta Previa, Placenta Accreta, and Vasa Previa. Obstetrics & Gynecology. 2006;107(4):927-941.

[16] Callahan T L, Caughey A B. Antepartum Hemorrhage. In : Obstetrics & Gynecology. 6th ed. Philadelphia: Lippincott Williams & Wilkins. 2013:62-71.

[17] Department of Health Government of Western Australia. Placenta Accreta: Management of A Woman With Suspected or Confirmed. Clinical Guidelines Abstetrics and Midwifery. 2014:1-8.

[18] Silver RM, Fox KA, Barton JR, Abuhamad AZ, Simhan H, Huls CK, Belfort MA, et al. Center of Excellence for Placenta Accreta. American Journal of Obstetrics and Gynecology. 2015:561-568.

[19] Collins S, Arulkumaran S, Hayes K, Jackson S, Impey L. Labour and Delivery. In : Oxford Handbook if Obstetrics and Gynaecology. London : Oxford University Press. 2012:320-321.

[20] Jauniaux E, Jurkovic D. Placenta accreta: Pathogenesis of a 20th century iatrogenic uterine disease. Placenta. 2012;33(4):244-251.

[21] Silver R, Barbour K. Placenta Accreta Spectrum. Obstet Gynecol Clin N Am. 2015;42:381–402.

[22] Belfort M. Placenta accreta. American Journal of Obstetrics and Gynecology. 2010;203(5):430-439.

[23] Berkley EM, Abuhamad AZ. Prenatal Diagnosis of Placenta Accreta. Journal of Ultrasound in Medicine. 2013;32(8):1345-1350.

[24] El-Messidi A, Mallozzi A, Oppenheimer L. A Multidisciplinary Checklist for Management of Suspected Placenta Accreta. Journal of Obstetrics and Gynaecology Canada. 2012;34(4):320-324.

[25] Rac MWF, Dashe JS, Wells CE, Moschos E, McIntire DD, Twickler DM. Ultrasound predictors of placental invasion: the Placenta Accreta Index. American Journal of Obstetrics & Gynecology. 2014; 211:1-7.

[26] American College of Obstetricians and Gynecologists. Placenta Accreta. Obstet Gynecol. 2012; 120:207-211.

[27] Usta I, Hobeika E, Musa A, Gabriel G, Nassar A. Placenta previa-accreta: Risk factors and complications. American Journal of Obstetrics and Gynecology. 2005;193:1045-1049.

[28] Johnston TA, Paterson-Brown S. Placenta Praevia, Placenta Praevia Accreta and Vasa Praevia: Diagnosis and Management. Royal College of Obstetricians and Gynaecologists. 2011;27:1-26

[29] Comstock C. Antenatal diagnosis of placenta accreta: a review. Ultrasound in Obstetrics and Gynecology. 2005;26(1):89-96.

[30] Herath R, Wijesinghe P. Management of morbidly adherent placenta. Sri Lanka Journal of Obstetrics and Gynaecology. 2012;33(2).

[31] Placenta accreta spectrum. Obstetric Care Consensus No. 7. American College of Obstetricians and Gynecologists. Obstet Gynecol 2018;132:e259-75. Available at: https://www.acog.org/Clinical-Guidance-and-Publications/Obstetric-Care-Consensus-Series/Placenta-Accreta-Spectrum?IsMobileSet=false [Accessed on 29 November 2019]

[32] Slaoui A, Talib S, Nah A, Moussaoui KE, Benzina I, Zeraidi N, Baydada A, Kharbach A. Placenta accrete in the department of gynaecology and obstetrics in Rabat, Morocco: case series and review of the literature. Pan African Medical Journal. 2019;33:86. doi:10.11604/pamj.2019.33.86.17700

[33] Rambei I. Gambaran faktor risiko pada kasus plasenta previa di RSUP Dr. M. Djamil Padang periode Januari 2005-2008. Tesis. Fakultas Kedokteran Universitas Andalas Padang. 2008.

[34] Kiodono P, Wandabwa J, Doyle. P. Risk Factor for placenta Previa Presenting with Severe vaginal bleeding in Mulago Hospital, Kampala, Uganda. African Health Science. 2008;8(1);44-49

[35] Nelson T, Chang E, Goodier C, Nino JM. Validation of the Placenta Accreta Index (PAI): Improving the antenatal diagnosis of the morbidly adherent placenta. AJOG. 2018; 209: S133.

[36] Zhang D, Yang S, Hou Y, Su Y, Shi H, Gu Wei. Risk factors, outcome and management survey of placenta accreta in 153 cases: a five-year experience from a hospital of Shanghai, China. Int J Clin Exp Med 2017;10(8):12509-12516. DOI: www.ijcem.com /ISSN:1940 5901/IJCEM0045795.

[37] Samosir SM, Irianti S, Tjahyadi D. Diagnostic tests of placenta accreta index score (PAIS) as supporting prenatal diagnosis and outcomes of neonatal in abnormally invasive placenta management at general hospital of Hasan Sadikin Bandung. Int J Reprod Contracept Obstet Gynecol 2017;6:3765-9.

[38] Agussul, Rozi, Ninta, Gala, Erza, Aldi. Algorithm of AIP in Dr. Soetomo General Hospital. 2018.