

Correlation of Placenta Accreta Spectrum Ultrasound Score and the International Federation of Gynecology and Obstetrics Clinical Grading in Placenta Accreta Spectrum Incidence at H. Adam Malik General Hospital, Medan

Andri Hamonangan Sipahutar¹, Muara Panusunan Lubis², Muhammad Fidel Ganis Siregar³, Makmur Sitepu⁴, Henry Salim Siregar⁵, Muhammad Rusda Harahap⁶

Received on: 13 June 2023; Accepted on: 30 August 2023; Published on: 22 November 2023

ABSTRACT

Background: Placenta accreta spectrum (PAS) is a general term used to describe the clinical condition when part of the placenta, or the entire placenta, invades the uterine wall making it difficult to separate. One of the methods to grade this disorder is the International Federation of Gynecology and Obstetrics (FIGO) grading system which helps in determining the nature and severity of PAS disorders. The PAS ultrasound grading was performed *via* transvaginal and transabdominal ultrasonography (in all cases) according to the guidelines for ultrasonographic (USG) detection of PAS using the following USG signs, loss of clear zone, placenta lacunae, bladder wall disorders, uterovesical hypervascularity, and increased vascularity of the parametrial region.

Aim and objective: To determine the relationship between PAS ultrasound score and FIGO clinical grading on the incidence of PAS disorders at H. Adam Malik General Hospital, Medan, Indonesia.

Materials and methods: Patient identity and secondary data were obtained from medical records. The PAS ultrasound score data was taken from transabdominal ultrasonography and transvaginal ultrasonography records. The FIGO clinical grading data collection was based on operative field findings. Some sections of the uterus and placenta were submitted to the anatomical pathology laboratory for histopathological examination to assess the involvement of the placenta invading the uterine wall. Finally, the correlation between the FIGO grading and PAS ultrasound score was calculated using SPSS software.

Results: The results showed that there was a significant relationship between the length of operation ($p = 0.042$; $p > 0.05$); curettage history ($p = 0.231$; $p > 0.05$); the amount of bleeding ($p = 0.16$; $p > 0.05$); gestational age at delivery ($p = 0.384$; $p > 0.05$); upper arm circumference (UAC) (all) ($p = 0.295$; $p > 0.05$); parity ($p = 0.133$; $p > 0.05$); and history of placenta accreta ($p = 0.761$; $p > 0.05$) with PAS score. There was a significant relationship between the amount of bleeding and arterial ligation with a value of $p = 0.011$ ($p < 0.05$) where the majority of patients who underwent ligation experienced bleeding of 2000–3000 cc compared to those who did not undergo the ligation procedure with bleeding below 2000 cc. The FIGO score frequency distribution was 17 people (34.7%) at stage I; 14 people (28.6%) at stage II; 9 people (18.4%) at stage IIIa; 6 people (12.2%) at stage IIIb; and 3 people (6.1%) were at stage IIIc. On the contrary, for PAS score found 7 people (14.3%) at stage 0; 22 people (44.9%) at stage I; 16 people (32.7%) at stage II; and 4 people (8.2%) at stage III. The Kolmogorov–Smirnov normality test showed that the PAS score and FIGO score data were not normally distributed ($p < 0.05$). After conducting the Chi-square test to assess the relationship between the FIGO score and the PAS score, a p -value of 0.000 was found; this value indicates that there is a significant relationship between the PAS score and the FIGO score ($p < 0.001$). Based on the presence of USG signs of impaired PAS, 57.9% [95% confidence interval (CI): 51.6–64.0%; 150/259] of women were classified as PAS 0, 15.1% (95% CI: 11, 2–19.9; 39/259) as PAS 1, 6.2% (95% CI: 3.8–9.8; 16/259) as PAS 2, and 20.8% (95% CI: 18, 2–26.4; 54/259) as PAS 3.

Conclusion: In this study, it was found that there was a significant relationship between PAS score and FIGO clinical grading in the incidence of PAS abnormalities.

Keywords: Cesarean section, Cervical, Childbirth, Fetus, High-risk pregnancy, Maternal, Placenta, Placenta accreta, Placenta accreta spectrum, Pregnancy.

Journal of Obstetric and Gynaecological Practices POGS (2023): 10.5005/jogyp-11012-0013

INTRODUCTION

Placenta accreta spectrum (PAS) anomaly is a clinical disorder in which the placenta partially or totally invades the uterine wall, making it challenging to separate the two organs. When the placenta is not completely separated from the uterus after delivery, massive obstetric hemorrhage happens. Adult respiratory distress syndrome, transfusion reactions I, electrolyte imbalance, kidney failure, DIC, hysterectomy, and repair of damaged ureters, bladders, bowels, or neurovascular structures, are all consequences of this illness.^{1,2} According to Dr. Soetomo Hospital research, the prevalence of placenta accreta in Surabaya, Indonesia, reached 4% in 2017.

^{1–6}Department of Obstetrics and Gynecology, Universitas Sumatera Utara, Medan, North Sumatera, Indonesia

Corresponding Author: Andri Hamonangan Sipahutar, Department of Obstetrics and Gynecology, Universitas Sumatera Utara, Medan, North Sumatera, Indonesia, Phone: +62 82161399007, e-mail: andrisipahutar23@gmail.com

How to cite this article: Sipahutar AH, Lubis MP, Siregar MFG, *et al.* Correlation of Placenta Accreta Spectrum Ultrasound Score and the International Federation of Gynecology and Obstetrics Clinical Grading in Placenta Accreta Spectrum Incidence at H. Adam Malik General Hospital, Medan. *J Obstet Gynaecol Pract POGS* 2023;1(2):33–41.

A survey conducted at the H. Adam Malik General Hospital in Medan, during the last four years revealed that placenta accreta affected 26 people (44.1%) in 2018 and 23 people (39.0%) in 2019.³

Maternal morbidity and mortality are increased by the obstetric condition known as PAS anomalies, which has a mortality rate of 7% and an increase in incidence from 0.12 to 0.31% during the past 30 years.⁴ The most frequent risk factors for PAS include prior cesarean sections and intrauterine surgery.

According to a recent study, there were 32.8% more cesarean sections performed in the USA in 2010 than there were in 1970 (5.5%).⁵ The PAS clinical grading system was developed by the International Federation of Gynecology and Obstetrics (FIGO).

The FIGO grading system makes it simpler to determine the kind and degree of PAS concerns. Despite not having been confirmed yet, the FIGO grading system is one of the best attempts to categorize PAS objectively. Because this rating system can only be used during childbirth and cannot be used to counsel women before to delivery, the clinical grading system based on ultrasound was used in its place. The use of ultrasound in the diagnosis of PAS illnesses has been linked to surgical outcomes, depth of invasion, and the FIGO clinical scoring system.⁶

MATERIALS AND METHODS

This quantitative study uses a case series design to examine the relationship between FIGO clinical grading and PAS ultrasound score in the incidence of placental spectrum abnormalities. The study was conducted in the Department of Obstetrics and Gynecology of the H. Adam Malik Hospital from July 2019 to February 2020. The population for this study consisted of all patients at H. Adam Malik General Hospital, Medan, Indonesia, who had been identified as having one of the illnesses on the PAS.

Inclusion Criteria

- Patients who have been diagnosed with placenta previa.
- Patients who have been diagnosed with PAS diseases.
- Patients who had their PAS ultrasound score and FIGO clinical grading exams performed.

Exclusion Criteria

- Incomplete medical records.
- Patients who had surgery outside of the facility where the study was carried out.

This study had 49 subjects in total. All research participants were involved in this study, and they were informed of its objectives, merits, benefits, advantages, and disadvantages, as well as its examination procedures. Participation in the study is fully voluntary for the subjects. The Health Research Ethics Committee of the Faculty of Medicine, Universitas Sumatera Utara, Medan, North Sumatera, Indonesia, as well as the research subjects gave their consent for the study to be conducted.

Statistical Analysis

The data was evaluated descriptively to determine the frequency distribution of the variables under investigation. A Chi-square test was used to determine the bivariate connection between categorical variables; if it failed to match the criteria, a Fisher Exact test was used. The FIGO clinical grading in the incidence of placenta spectrum abnormalities and the PAS ultrasound score can be correlated using the Pearson correlation test if the data are normally

Source of support: Nil

Conflict of interest: None

distributed, and Spearman if not normally distributed. The range of scores for correlation strength is 0.30–0.49 for moderate correlation, 0.50–0.69 for strong correlation, and 0.70–0.99 for extremely strong correlation. In a statistical study that was out using a statistical software tool, a *p*-value of 0.05 was deemed significant.

RESULTS

A total of 49 individuals with PAS diagnoses were examined. A prior cesarean section was one of the risk factors that contributed to the development of the PAS.

Based on the information in Table 1, it demonstrates the relationship between the previous cesarean section, PAS score, and FIGO grading. We discovered no link between the PAS score and the previous cesarean section ($p = 0.206$), however, we found a different outcome when we looked at its correlation with FIGO grading. The FIGO grading and previous cesarean section had a correlation ($p = 0.49$), with an average grade of II–IIIc and a 2× record of cesarean section. Curettage was also one of the risk factors that contributed to the cause of PAS by causing iatrogenic damage after its use.

In our investigation, the connection between FIGO and PAS grading and curettage history was substantial ($p = 0.03$; $p = 0.206$); Table 2 displays the data.

Table 3 shows the link between FIGO and PAS grading and duration of operation in our study ($p = 0.033$; $p = 0.042$). In FIGO grading, the majority of grade I–II patients have surgery for 1–2 hours, whereas the majority of FIGO stage IIIa–c patients have surgery for more than 3 hours.

The PAS 0–1 group was found to run for 1–2 hours, while the PAS 2 group operated for more than 3 hours. Whereas PAS 3 yielded the same results after 1–2 and above 3 hours of operation. Different results were obtained based on the volume of bleeding and the association with FIGO and PAS grading. The FIGO grading correlation yielded a significant result ($p = 0.024$).

Based on the information shown in Table 4, the majority of the bleeding was determined to be 1000 cc at the FIGO I stage and 1000–3000 cc at the FIGO II–IIIc level. The connection with the PAS score was non-existent ($p = 0.16$). The type of operation performed on the subject was investigated for any link with FIGO and PAS grading.

Table 5 shows that there is a substantial link between the two grades and the type of procedure ($p = 0.000$; $p = 0.000$). At FIGO stage I, conservative treatment is preferred, whereas hysterectomy is preferred at all other FIGO stages. Conservative therapy is typically used in the PAS 0 group, whereas hysterectomy is indicated in the PAS 1–3 group.

Table 6 examines the relationship between gestational age, FIGO, and PAS grading. The relationship between gestational age and grading was not significant ($p = 0.104$; $p = 0.384$). The relationship between age and FIGO and PAS grade was discovered to be significant ($p = 0.008$; $p = 0.014$).

Table 7 shows the majority of patients with FIGO stages I–II were over the age of 35, while those with FIGO stages IIIa–c were between the ages of 21 and 34. Using the PAS score, the majority of patients in the PAS 0–1 group are beyond the age of 35, whereas

Table 1: Previous cesarean section correlation with FIGO and PAS grading

	PAS score				Total	p-value
	PAS 0	PAS 1	PAS 2	PAS 3		
Previous cesarean section						
Never	1 16.7%	5 83.3%	0 0%	0 0%	6 100.0%	0, 206
1x	3 20.0%	7 46.7%	5 33.3%	0 0%	15 100.0%	
2x	3 10.7%	10 35.7%	11 39.3%	4 14.3%	28 100.0%	
Total	7 14.3%	22 44.9%	16 32.7%	4 8.2%	49 100.0%	

	FIGO clinical grading					Total	p-value
	FIGO I	FIGO II	FIGO IIIa	FIGO IIIb	FIGO IIIc		
Previous cesarean section							
Never	6 100.0%	0 0%	0 0%	0 0%	0 0%	6 100.0%	0, 049
1x	6 40.0%	4 26.7%	3 20.0%	1 6.7%	1 6.7%	15 100.0%	
2x	5 17.9%	10 35.7%	6 21.4%	5 17.9%	2 7.1%	28 100.0%	
Total	17 34.7%	14 28.6%	9 18.4%	6 12.2%	3 6.1%	49 100.0%	

Table 2: Previous curettage correlation with FIGO and PAS

	PAS score				Total	p-value
	PAS 0	PAS 1	PAS 2	PAS 3		
Previous curettage						
Never	7 14.9%	22 46.8%	14 29.8%	4 8.5%	47 100.0%	0.231
1x	0 0%	0 0%	2 100.0%	0 0%	2 100.0%	
Total	7 14.3%	22 44.9%	16 32.7%	4 8.2%	49 100.0%	

	FIGO clinical grading					Total	p-value
	FIGO I	FIGO II	FIGO IIIa	FIGO IIIb	FIGO IIIc		
Previous curettage							
Never	17 36.2%	14 29.8%	9 19.1%	5 10.6%	2 4.3%	47 100.0%	0.03
1x	0 0%	0 0%	0 0%	1 50.0%	1 50.0%	2 100.0%	
Total	17 34.7%	14 28.6%	9 18.4%	6 12.2%	3 6.1%	49 100.0%	

the majority of patients in the PAS 2–3 group are between the ages of 21 and 34. Upper arm circumference (UAC) was also measured.

Based on the information in Table 8, we discovered no connection between FIGO and PAS grading and patient UAC ($p = 0.220$; $p = 0.295$).

Table 9 shows the number of parity and the link with FIGO and PAS grade in this study. The number of parities with FIGO and PAS grading had no connection ($p = 0.171$; $p = 0.133$). The association between prior placenta accreta and FIGO and PAS grade was

investigated. There is no connection between prior placenta accreta and FIGO and PAS grade ($p = 0.710$; $p = 0.761$) (Table 10).

This study looked at artery ligation and its relationship to hemorrhage. We discovered a significant link between arterial ligation and hemorrhage ($p = 0.011$). The majority of subjects having ligation bleed between 1000 and 3000 cc (Table 11).

This study looked at the relationship between FIGO grade and PAS score. The PAS score and FIGO clinical grading data were not normally distributed, according to the Kolmogorov–Smirnov

The PAS Ultrasound Score and FIGO Clinical Grading in PAS Incidence

Table 3: Operation duration correlation with FIGO and PAS

	PAS score				Total	p-value
	PAS 0	PAS 1	PAS 2	PAS 3		
Operation duration						
<1 hour	1 33.3%	2 66.7%	0 0%	0 0%	3 100.0%	0.042
1–2 hours	5 17.9%	16 57.1%	5 17.9%	2 7.1%	28 100.0%	
>3 hours	1 5.6%	4 22.2%	11 61.1%	2 11.1%	18 100.0%	
Total	7 14.3%	22 44.9%	16 32.7%	4 8.2%	49 100.0%	

	FIGO clinical grading					Total	p-value
	FIGO I	FIGO II	FIGO IIIa	FIGO IIIb	FIGO IIIc		
Operation duration							
<1 hour	2 66.7%	1 33.3%	0 0%	0 0%	0 0%	3 100.0%	0.033
1–2 hours	14 50.0%	8 28.6%	3 10.7%	3 10.7%	0 0%	28 100.0%	
>3 hours	1 5.6%	5 27.8%	6 33.3%	3 16.7%	3 16.7%	18 100.0%	
Total	17 34.7%	14 28.6%	9 18.4%	6 12.2%	3 6.1%	49 100.0%	

Table 4: Bleeding volume correlation with FIGO and PAS

	PAS score				Total	p-value
	PAS 0	PAS 1	PAS 2	PAS 3		
Bleeding volume						
<1000	4 19.0%	12 57.1%	5 23.8%	0 0%	21 100.0%	0.16
1000–3000	2 7.7%	10 38.5%	10 38.5%	4 15.4%	26 100.0%	
>3000	1 50.0%	0 0%	1 50.0%	0 0%	2 100.0%	
Total	7 14.3%	22 44.9%	16 32.7%	4 8.2%	49 100.0%	

	FIGO clinical grading					Total	p-value
	FIGO I	FIGO II	FIGO IIIa	FIGO IIIb	FIGO IIIc		
Bleeding volume							
<1000	12 57.1%	7 33.3%	2 9.5%	0 0%	0 0%	21 100.0%	0.024
1000–3000	4 15.4%	7 26.9%	7 26.9%	5 19.2%	3 11.5%	26 100.0%	
>3000	1 50.0%	0 0%	0 0%	1 50.0%	0 0%	2 100.0%	
Total	17 34.7%	14 28.6%	9 18.4%	6 12.2%	3 6.1%	49 100.0%	

normality test ($p = 0.05$). A p -value of 0.000 was observed after doing the Chi-square test to analyze the link between FIGO clinical grading and PAS score, indicating that there is a significant relationship between PAS score and FIGO clinical grading ($p = 0.001$); [Table 12](#)

contains the answers. The PAS 1 stage is known to be associated with FIGO I–II stadium, the PAS 2 stage is known to be related to the FIGO IIIa–b stage, and PAS 3 stage is known to be related to FIGO IIIc stage.

Table 5: Surgical type correlation with FIGO and PAS

	PAS score				Total	p-value
	PAS 0	PAS 1	PAS 2	PAS 3		
Surgery type						
Hysterectomy	0 0%	12 37.5%	16 50.0%	4 12.5%	32 100.0%	0.000
Conservative	7 41.2%	10 58.8%	0 0%	0 0%	17 100.0%	
Total	7 14.3%	22 44.9%	16 32.7%	4 8.2%	49 100.0%	

	FIGO clinical grading					Total	p-value
	FIGO I	FIGO II	FIGO IIIa	FIGO IIIb	FIGO IIIc		
Surgery type							
Hysterectomy	0 0%	14 43.8%	9 28.1%	6 18.8%	3 9.4%	32 100.0%	0.000
Conservative	17 100.0%	0 0%	0 0%	0 0%	0 0%	17 100.0%	
Total	17 34.7%	14 28.6%	9 18.4%	6 12.2%	3 6.1%	49 100.0%	

Table 6: Gestational age correlation with FIGO and PAS

	PAS score				Total	p-value
	PAS 0	PAS 1	PAS 2	PAS 3		
Gestational age at labor						
37 weeks	5 13.9%	14 38.9%	13 36.1%	4 11.1%	36 100.0%	0.384
>37 weeks	2 15.4%	8 61.5%	3 23.1%	0 0%	13 100.0%	
Total	7 14.3%	22 44.9%	16 32.7%	4 8.2%	49 100.0%	

	FIGO clinical grading					Total	p-value
	FIGO I	FIGO II	FIGO IIIa	FIGO IIIb	FIGO IIIc		
Gestational age at labor							
37 weeks	10 27.8%	12 33.3%	5 13.9%	6 16.7%	3 8.3%	36 100.0%	0.104
>37 weeks	7 53.8%	2 15.4%	4 30.8%	0 0%	0 0%	13 100.0%	
Total	17 34.7%	14 28.6%	9 18.4%	6 12.2%	3 6.1%	49 100.0%	

DISCUSSION

Tables 1 to 10 revealed a significant connection between operating duration ($p = 0.042$; $p = 0.05$), kind of operation ($p = 0.000$; $p = 0.001$), age ($p = 0.014$; $p < 0.05$), and PAS score. After conducting the Chi-square test, it was concluded that there was no significant relationship between operating history ($p = 0.206$; $p > 0.05$); curettage history ($p = 0.231$; $p > 0.05$); the amount of bleeding ($p = 0.16$; $p > 0.05$); gestational age at delivery ($p = 0.384$; $p > 0.05$); UAC (all) ($p = 0.295$; $p > 0.05$); parity ($p = 0.133$; $p > 0.05$) and history of placenta accreta ($p = 0.761$; $p > 0.05$) with PAS score.

In a case-control study using the UK Obstetric Surveillance System (UKOSS), it was found that women with a history of cesarean delivery [adjusted odds ratio (aOR): 14.41, 95% confidence interval (CI): 5.63–36.85], additional uterine surgeries (aOR: 3.40, 95% CI:

1.30–8.91), an IVF pregnancy (aOR: 32.13, 95% CI: 2.03–509.23), and placenta previa diagnosis antepartum (aOR: 65). A connection between advanced maternal age and an elevated risk of PAS was also discovered in this study among women who had never undergone a cesarean section (aOR: 1.30, 95% CI: 1.13–1.50 for every year after 35 years).⁷

The incidence of placenta previa accreta was found to be 4.1% in women who had only had one prior cesarean section and 13.3% in women who had had two or more prior cesarean sections, according to a recent systematic review and meta-analysis of 3,889 women who had at least one prior cesarean delivery and placenta previa or a low-lying placenta on ultrasound that was confirmed at delivery. However, these estimates may be too low given that invasive forms of PAS frequently result in hysterectomies, which prevent additional pregnancies.⁵

The PAS Ultrasound Score and FIGO Clinical Grading in PAS Incidence

Table 7: Age correlation with PAS and FIGO

	PAS score				Total	p-value
	PAS 0	PAS 1	PAS 2	PAS 3		
Age						
>35 years	5 15.6%	19 59.4%	7 21.9%	1 3.1%	32 100.0%	0.014
21–35 years	2 11.8%	3 17.6%	9 52.9%	3 17.6%	17 100.0%	
Total	7 14.3%	22 44.9%	16 32.7%	4 8.2%	49 100.0%	

	FIGO clinical grading					Total	p-value
	FIGO I	FIGO II	FIGO IIIa	FIGO IIIb	FIGO IIIc		
Age							
>35 years	13 40.6%	13 40.6%	3 9.4%	2 6.3%	1 3.1%	32 100.0%	0.008
21–35 years	4 23.5%	1 5.9%	6 35.3%	4 23.5%	2 11.8%	17 100.0%	
Total	17 34.7%	14 28.6%	9 18.4%	6 12.2%	3 6.1%	49 100.0%	

Table 8: The UAC correlation with FIGO and PAS

	PAS score				Total	p-value
	PAS 0	PAS 1	PAS 2	PAS 3		
UAC						
Underweight	0 0%	2 100.0%	0 0%	0 0%	2 100.0%	0.295
Normal weight	6 18.8%	16 50.0%	8 25.0%	2 6.3%	32 100.0%	
Overweight	1 8.3%	4 33.3%	6 50.0%	1 8.3%	12 100.0%	
Obese	0 0%	0 0%	2 66.7%	1 33.3%	3 100.0%	
Total	7 14.3%	22 44.9%	16 32.7%	4 8.2%	49 100.0%	

	FIGO clinical grading					Total	p-value
	FIGO I	FIGO II	FIGO IIIa	FIGO IIIb	FIGO IIIc		
UAC							
Underweight	1 50.0%	1 50.0%	0 0%	0 0%	0 0%	2 100.0%	0.220
Normal weight	14 43.8%	9 28.1%	4 12.5%	3 9.4%	2 6.3%	32 100.0%	
Overweight	2 16.7%	4 33.3%	4 33.3%	1 8.3%	1 8.3%	12 100.0%	
Obese	0 0%	0 0%	1 33.3%	2 66.7%	0 0%	3 100.0%	
Total	17 34.7%	14 28.6%	9 18.4%	6 12.2%	3 6.1%	49 100.0%	

UAC, upper arm circumference

By FIGO clinical grading, we also discovered a significant relationship between operating history ($p = 0.049$; $p = 0.05$), history of curettage ($p = 0.03$; $p = 0.05$), operating time ($p = 0.033$; $p = 0.05$), amount of bleeding ($p = 0.024$; $p = 0.05$), type of operation ($p = 0.000$; $p = 0.001$), and age ($p = 0.008$; $p = 0.05$). The Chi-square test, however, revealed no significant relationship between



The PAS Ultrasound Score and FIGO Clinical Grading in PAS Incidence

Table 9: Parity correlation with FIGO and PAS

	<i>PAS score</i>				<i>Total</i>	<i>p-value</i>
	<i>PAS 0</i>	<i>PAS 1</i>	<i>PAS 2</i>	<i>PAS 3</i>		
Parity						
Primigravida	1 20.0%	4 80.0%	0 0%	0 0%	5 100.0%	0.133
Secundigravida	1 8.3%	9 75.0%	2 16.7%	0 0%	12 100.0%	
Multigravida	5 16.1%	9 29.0%	13 41.9%	4 12.9%	31 100.0%	
Grand multipara	0 0%	0 0%	1 100.0%	0 0%	1 100.0%	
Total	7 14.3%	22 44.9%	16 32.7%	4 8.2%	49 100.0%	

	<i>FIGO clinical grading</i>					<i>Total</i>	<i>p-value</i>
	<i>FIGO I</i>	<i>FIGO II</i>	<i>FIGO IIIa</i>	<i>FIGO IIIb</i>	<i>FIGO IIIc</i>		
Parity							
Primigravida	4 80.0%	1 20.0%	0 0%	0 0%	0 0%	5 100.0%	0.171
Secundigravida	7 58.3%	3 25.0%	1 8.3%	1 8.3%	0 0%	12 100.0%	
Multigravida	6 19.4%	10 32.3%	7 22.6%	5 16.1%	3 9.7%	31 100.0%	
Grand multipara	0 0%	0 0%	1 100.0%	0 0%	0 0%	1 100.0%	
Total	17 34.7%	14 28.6%	9 18.4%	6 12.2%	3 6.1%	49 100.0%	

Table 10: Placenta accreta history correlation with FIGO and PAS

	<i>PAS score</i>				<i>Total</i>	<i>p-value</i>
	<i>PAS 0</i>	<i>PAS 1</i>	<i>PAS 2</i>	<i>PAS 3</i>		
Placenta accreta history						
Never	6 13.0%	21 45.7%	15 32.6%	4 8.7%	46 100.0%	0.761
1×	1 33.3%	1 33.3%	1 33.3%	0 0%	3 100.0%	
Total	7 14.3%	22 44.9%	16 32.7%	4 8.2%	49 100.0%	

	<i>FIGO clinical grading</i>					<i>Total</i>	<i>p-value</i>
	<i>FIGO I</i>	<i>FIGO II</i>	<i>FIGO IIIa</i>	<i>FIGO IIIb</i>	<i>FIGO IIIc</i>		
Placenta accreta history							
Never	15 32.6%	13 28.3%	9 19.6%	6 13.0%	3 6.5%	46 100.0%	0.710
1×	2 66.7%	1 33.3%	0 0%	0 0%	0 0%	3 100.0%	
Total	17 34.7%	14 28.6%	9 18.4%	6 12.2%	3 6.1%	49 100.0%	

gestational age at delivery ($p = 0.104$; $p > 0.05$), UAC ($p = 0.220$; $p > 0.05$), parity ($p = 0.171$; $p > 0.05$), and history of placenta accreta ($p = 0.710$; $p > 0.05$) and FIGO clinical grading.

Negro and other researchers' findings: On the basis of histological or surgical confirmation, the samples were separated into four groups, ranging from group 0 (no PAS) to group 3 (PAS) (placenta percreta). The duration of group 3's stay was 9–5 days longer than group 0's—representing a significant difference in stay duration. Surgical procedures in groups 2 and 3 lasted significantly longer (126, 5–170 minutes) than those in the other groups; p -value is 0.001. A total hysterectomy was performed in 10 cases (52, 6%) from group 1, four cases (66.7%) from group 1, and every case (100%) from group 3.⁸

According to Table 11, there was a significant correlation between the amount of bleeding and arterial ligation, with a value of $p = 0.011$ ($p = 0.05$), and the majority of patients who had the procedure experienced bleeding of 2000–3000 cc as opposed to those who did not, who experienced bleeding of 2000 cc. A total of 28 cases of significant bleeding (40.6%) and 41 cases of non-severe hemorrhage (59.4%) were found in Orgul's study. There were statistically significant differences between groups in the total amount of blood loss and the number of situations requiring red blood cell (RBC) transfusion (0.005 and 0.002, respectively). Uterine compression suture was used in 7.2% ($n = 5$) of the cases, uterine artery ligation was done in 13% ($n = 9$) of the cases, and it was done in 1.4% ($n = 1$) of the instances.⁹

The FIGO score frequency distribution is determined from Table 12; with 17 people (34.7%) in stage I; 14 people (28.6%) in stage II; 9 people (18.4%) in stage IIIa; 6 people (12.2%) in stage IIIb; and

3 people (6.1%) in stage IIIc. For PAS score, 7 people (14.3%) were detected at stage 0; 22 people (44.9%) at stage I; 16 people (32.7%) at stage II; and 4 people (8.2%) at stage III. The PAS and FIGO score values were not normally distributed, according to the Kolmogorov–Smirnov normality test ($p = 0.05$). Following the Chi-square test to assess the relationship between the FIGO score and the PAS score, a p -value of 0.000 was discovered, indicating that there is a significant relationship between the PAS score and the FIGO score.

Based on the presence of ultrasonographic (USG) evidence of compromised PAS, women were classified as PAS 0, 15.1% (95% CI: 11, 2–19.9%; 39/259) as PAS 1, 6.2% (95% CI: 3.8–9.8%; 16/259) as PAS 2, and 20.8% (95% CI: 18, 2–26.4%; 54/259) as PAS 3. Women with PAS 0 were substantially younger than those with PAS 1 (35.0 + 4.5 years), PAS 2 (33.8 + 3.7 years), and PAS3 (35.0 + 3.8 years), while women with PAS 1, PAS 2, and PAS 3 did not vary significantly in terms of maternal age. Women with PAS 0 had a later gestational age than those with PAS 1, PAS 2, and PAS 3 (36.4 + 1.1 weeks, 34.7 + 1.1 weeks, and 33.9 + 1.9 weeks, respectively).⁶

A 100% of cases of PAS can be diagnosed using a model based on three factors: Abnormal lacunae structure (grades 2 and 3), bladder wall abnormalities, and uterovesical vascularization.¹⁰ The Spearman relationship test results for PAS patients in the study by Lumban Raja were negatively correlated with their PAS and FIGO scores ($r = -0.223$). With a value of $p = 0.29$ ($p > 0.05$), the Chi-square test on patients with PAS revealed a significant correlation between PAS and FIGO scores. The relationship category also included the FIGO spectrum placenta accreta and PAS patient relationship scores, with sensitivity, specificity, PPV, and NPV values of 46, 75, 81.2, and 37.5, respectively.¹¹

Despite being associated with high rates of maternal morbidity (40–50%) and, in the case of placenta percreta, a mortality rate of up to 7% due to damage to the pelvic organs and blood vessels, cesarean hysterectomy remains the gold standard of treatment for invasive accreta. The majority of Society of Perinatal Obstetricians, with and without experience in the management of PAS disorders, prefer conservative treatment when adjacent pelvic organs such as the bladder and bowel are involved (69 and 70%, respectively), according to a survey of previous preferences for surgical versus conservative therapy in cases of placenta percreta.

CONCLUSION

There was a strong association between PAS score and FIGO clinical grading in the occurrence of PAS anomalies in this study. We also

Table 11: Artery ligation correlation with bleeding

	Ligation		Total	<i>p</i> -value
	Yes	No		
Bleeding				
<1000	8	13	21	0.011
	38.1%	61.9%	100.0%	
1000–3000	21	5	26	100.0%
	80.8%	19.2%	100.0%	
1000–3000	1	1	2	100.0%
	50.0%	50.0%	100.0%	
Total	30	19	49	
	61.2%	38.8%	100.0%	

Table 12: The FIGO and PAS correlation

	FIGO clinical grading					Total	<i>p</i> -value
	FIGO I	FIGO II	FIGO IIIa	FIGO IIIb	FIGO IIIc		
PAS score							
PAS 0	7	0	0	0	0	7	0.000
	100.0%	0%	0%	0%	0%	100.0%	
PAS 1	10	11	1	0	0	22	100.0%
	45.5%	50.0%	4.5%	0%	0%	100.0%	
PAS 2	0	3	8	4	1	16	100.0%
	0%	18.8%	50.0%	25.0%	6.3%	100.0%	
PAS 3	0	0	0	2	2	4	100.0%
	0%	0%	0%	50.0%	50.0%	100.0%	
Total	17	14	9	6	3	49	
	34.7%	28.6%	18.4%	12.2%	6.1%	100.0%	

discovered a substantial relationship between the PAS score and the length of operation, kind of operation, and age. There was also no significant link between the PAS score and the history of surgery, history of curettage, amount of bleeding, gestational age at birth, UAC (all), parity, and history of placenta accreta in this study.

There is a significant relationship between FIGO clinical grading and history of surgery, history of curettage, length of operation, amount of bleeding, type of operation, and age, but there is no significant relationship between FIGO clinical grading and gestational age at delivery, UAC (all), parity, and history of placenta accreta. There was a substantial association between the amount of bleeding and artery ligation in this study, with the majority of patients who had ligation experiencing bleeding of 1000–3000 cc.

Clinical Significance

By identifying the correlation between FIGO grading and PAS scoring, we can effectively use either one of the grading systems and knowing each limitation when put into practice.

ORCID

Andri Hamonangan Sipahutar  <https://orcid.org/0009-0000-2981-1710>

REFERENCES

1. Committee On Obstetric Practice. Committee opinion No. 529: Placenta accreta. *Obstet Gynecol* 2012;120(1):207–211. DOI: 10.1097/AOG.0b013e318262e340.
2. Aryananda RA. Resurgence of placenta accreta in Indonesia opinion: Resurgence of placenta accreta in Indonesia. *Maj Obs Gin* 2018;26(3):98–99. DOI: 10.20473/mog.V26I32018.98-99.
3. Dwi PS. Analisis Kejadian Plasenta Akreta Di Rsup H. Adam Malik Medan Tahun 2016–2019. Available at: <http://Repositori.Usu.Ac.Id/Handle/123456789/25050> 2019. Accessed on: 14 July 2021.
4. Zhang D, Siqin Y, Yanyan H, et al. Risk Factors, Outcome and management survey of PAS disorders in 153 cases: A five-year experience from a hospital of Shanghai, China. *Int J Clin Exp Med* 2017;10(8):12509–12516.
5. Jauniaux E, Chantraine F, Silver RM, et al. FIGO placenta accreta diagnosis and management expert consensus panel. FIGO consensus guidelines on placenta accreta spectrum disorders: Epidemiology. *Int J Gynaecol Obstet* 2018;140(3):265–273. DOI: 10.1002/Ijgo.12407.
6. Cali G, Forlani F, Lees C, et al. Prenatal ultrasound staging system for placenta accreta spectrum disorders. *Ultrasound Obstet Gynecol* 2019;53(6):752–760. DOI: 10.1002/uog.20246.
7. Fitzpatrick KE, Sellers S, Spark P, et al. Incidence and risk factors for placenta accreta/increta/percreta in the UK: A national case–control study. *PloS One* 2012;7(12):e52893. DOI: 10.1371/journal.pone.0052893.
8. Negro VD, Aleksa N, Galli C, et al. Ultrasonographic diagnosis of placenta accreta spectrum (PAS) disorder: Ideation of an ultrasonographic score and correlation with surgical and neonatal outcomes. *Diagnostics (Basel)* 2020;11(1):23. DOI: 10.3390/diagnostics11010023.
9. Orgul G, Ayhan SG, Saracoglu GC, et al. Is it possible to predict massive bleeding in nulliparous women with placenta previa? *Rev Bras Ginecol Obstet* 2021;43(1):9–13. DOI: 10.1055/s-0040-1721355.
10. Fard MB, Kasraeian M, Vafaei H, et al. Introducing an efficient model for the prediction of placenta accreta spectrum using the MCP regression approach based on sonography indexes: How efficient is sonography in diagnosing accreta? *BMC Pregnancy Childbirth* 2020;20(1):111. DOI: 10.1186/s12884-020-2799-0.
11. Lumbanraja SN, Yaznil MR, Siahaan AM. The effectiveness of the USG PAS score in detecting the outcome of the placenta accreta spectrum. *Ann Gynecol Obstetr Res* 2020;3(1):1018.