



11-1-2022

PREVALENCE AND TYPES OF ABNORMALLY ADHERENT PLACENTA IN WOMEN WITH CS

Mohamed Mohamed

Department of Obstetrics and Gynecology, Al-Azhar University, Faculty of Medicine for boys, Cairo, Egypt,
drmhassaan999@gmail.com

Ibrahim AbouSekein

Department of Obstetrics and Gynecology, Al-Azhar University, Faculty of Medicine for boys, Cairo, Egypt,
dr.ibrahim.abousekein@gmail.com

Attia Attia

Department of Obstetrics and Gynecology, Al-Azhar University, Faculty of Medicine for boys, Cairo, Egypt,
elbalkimyattia@gmail.com

Follow this and additional works at: <https://aimj.researchcommons.org/journal>



Part of the [Medical Sciences Commons](#), [Obstetrics and Gynecology Commons](#), and the [Surgery Commons](#)

How to Cite This Article

Mohamed, Mohamed; AbouSekein, Ibrahim; and Attia, Attia (2022) "PREVALENCE AND TYPES OF ABNORMALLY ADHERENT PLACENTA IN WOMEN WITH CS," *Al-Azhar International Medical Journal*: Vol. 3: Iss. 11, Article 13.

DOI: <https://doi.org/10.21608/aimj.2022.138762.1948>

This Original Article is brought to you for free and open access by Al-Azhar International Medical Journal. It has been accepted for inclusion in Al-Azhar International Medical Journal by an authorized editor of Al-Azhar International Medical Journal. For more information, please contact dryasserhelmy@gmail.com.

Prevalence and Types of Abnormally Adherent Placenta in Women with CS

Mohamed Hassan Mohamed Hasan^{1,*} M.B.B.Ch, Ibrahim Abdel hamid AbouSekein² MD and Attia Mohamed Attia² MD.

Obstetrics & Gynecology

*Corresponding Author:

Mohamed Hassan Mohamed Hasan
drmhassaan999@gmail.com

Received for publication June 01, 2022; Accepted November 21, 2022; Published online November 21, 2022.

doi: 10.21608/aimj.2022.138762.1948

Citation: Mohamed H. , Ibrahim A. and Attia M. Prevalence and Types of Abnormally Adherent Placenta in Women with CS. AIMJ. 2022; Vol.3-Issue10 : 77-82.

¹Resident of Obstetrics and Gynecology Department, El Tahrir General Hospital, Egypt.

²Obstetrics and Gynecology Department, Faculty of Medicine, Al-Azhar University Cairo, Egypt.

ABSTRACT

Background: A variety of complications has become a direct result of increasing the rate of cesarean section which includes postpartum haemorrhage, sepsis, visceral injury, postoperative ileus, placenta previa and morbidly adherent placenta.

Aim of the work: To detect the prevalence of morbidly adherent placenta among women with variety of numbers of previous cesarean sections.

Patients and methods: This was a prospective cross-sectional research that took place in an inpatient, outpatient and emergency of Sayed Galal maternity hospital Faculty of Medicine Al-Azher University.

Results: there is high significant relation between number of previous cesarean section (P.C.S) and the incidence of placenta accreta in all studied cases (P-value < 0.0001).

Conclusion: Overmedicalization of the birth process in Egypt, as seen by the overuse of cesarean section, is a serious public health problem that requires prompt attention because to the excessive pressure CS causes on the health system. Evidence-based interventions addressing these variables, including disseminating delivery procedures and practice guidance, training providers in VBAC, and improving hospitals' monitoring and supervision systems, are essential to minimize this potentially avoidable surgical operation that poses different risks to mothers and babies.

Keywords: Cesarean section; Hemorrhage; Maternal morbidity; Placenta Previa; Prevalence.

Disclosure: The authors have no financial interest to declare in relation to the content of this article. The Article Processing Charge was paid for by the authors.

Authorship: All authors have a substantial contribution to the article.

Copyright: The Authors published by Al-Azhar University, Faculty of Medicine, Cairo, Egypt. Users have the right to read, download, copy, distribute, print, search, or link to the full texts of articles under the following conditions: Creative Commons Attribution-Share Alike 4.0 International Public License (CC BY-SA 4.0).

INTRODUCTION

The prevalence of CS has increased dramatically in Egypt over the last decade, with more recent Egypt Demographic and Health Survey (EDHS) reporting a rate of 52 percent, suggesting that caesarean birth may be overused or performed for unsuitable reasons.¹

A variety of complications has become a direct result of increasing the rate of cesarean section which includes postpartum hemorrhage, sepsis, visceral injury, postoperative ileus, placenta previa and morbidly adherent placenta.²

The placenta is a transitory vascular organ that joins the growing embryo to the uterine wall via the umbilical cord to permit uptake of nutrients, thermoregulation, eliminating waste, and gas exchange via the mother's blood supply; to fight internal infection; and to generate hormones that facilitate pregnancy. A typical placenta weighs about 470 g, is round to oval with a diameter of about 22 cm, and a central thickness of about 2.5 cm.³

Morbidly adherent placenta has a number of risk factors. A previous caesarean birth is the most prevalent, with the likelihood rising as the frequency of cesarean deliveries increases.⁴

Severe and even life-threatening bleeding, which frequently necessitates blood transfusion, may result in maternal morbidity and fatality. Women with a morbidly adherent placenta have a higher risk of maternal mortality, and they are more likely to need a hysterectomy after birth or the postpartum period, as well as having longer hospital admissions.⁵

Although clinical risk evaluation is the most essential tool for evaluating for placenta accreta spectrum, many studies show that obstetric ultrasonography has a greater specificity and sensitivity in the detection of placenta accreta spectrum, making it the more commonly used diagnostic tool. Additional confirmatory diagnostic tools include MRI because of its increased ability to differentiate soft tissue interactions.⁶

The aim of the research was to detect the prevalence of morbidly adherent placenta among women with variety of numbers of previous cesarean sections.

PATIENTS AND METHODS

This was prospective cross-sectional research that took place in an inpatient, outpatient and emergency of Sayed Galal maternity hospital Faculty of Medicine Al-Azher University.

Study population: This study was conducted on 200 pregnant women. They were assigned by computer list in two groups: **Control group:** 100 women who had no previous uterine scars and **CS group:** 100 women who were categorized according to the number of CS they had done.

Inclusion Criteria for study group: Age in childbearing period, pregnant women in 2nd and 3rd trimester, number of **Cs and uterine surgeries** had been done, the place where the previous CS done, the current and previous incidence of placenta previa and the time interval between every CS to identify the maturity of the scar.

Exclusion Criteria for groups: Normal vaginal deliveries.

Methods: The eligible subjects included in this study will be subjected to the following:

Informed consent was obtained from each participant.

History taking: Patient's demographic data, patient's menstrual history, patient's obstetric history (Parity, Gestational age) relevant family history and present or past medical and surgical histories, number of CS, hospitals in which CS is done, doctors practiced the operation, any complications during or after the previous CSs especially the surgical complications and how they had been managed and if they had experienced placenta previa or placenta accrete spectrum before.

Monitor for maternal well-being: Pulse rate, blood pressure, temperature and any other maternal complaint i.e. vaginal bleeding, tender scar, pallor, palpitations ect...).

Monitoring of fetal well-being: Application of CTG to all participants on monthly basis till delivery and measuring fetal sonographic parameters i.e CRL, HC, AC, FL ect.

Placental sonographic assessment: Location and extension, size, endometrial placental bed and

invasion of placenta within myometrium and surrounding organs é. blood flow within placenta

Procedure: All patients had a gray scale B-mode transabdominal ultrasonography while in a slightly inclined posture with the head of the bed elevated 30 degrees and a little cushion under the right loin. The Voluson 730 ProV ultrasound machine was employed, which has a Doppler unit and a 3.5 MHz convex linear transducer.

We looked at the following sonographic criteria for placenta accreta: Between the placenta and the echodense border zone displaying uterine serosa and posterior bladder wall, the hypoechoic myometrial zone in the anterior lower segment of the uterus is thinning (less than 1 mm thick) or nonexistent. The linear hyperechoic uterine serosa-bladder wall complex thinning, irregularity, or focal disruption Whether observed via the distended bladder or cephalad or lateral to the bladder, there are focal mass-like increases or expansions of tissue with the same echogenicity as the placenta outside the uterine serosa.

Lacunar vascular spaces were found in the placental parenchyma and were graded as follows: 0; none found; I+, one to three present, usually insignificant; 2+, four to six present, bigger or more abnormal in shape; 3+, many scattered around the placenta, some enormous and strange. MRI was done to all the patients while they are in supine position, which resulted in the following characteristic findings: The appearance of intraplacental bands on T2W imaging, heterogeneous signal strength inside the placenta, and aberrant placental vascularity are all signs of placental and uterine tissue bursting into the bladder and adjacent organs.

Ethical Consideration: The Alazhar University Institutional Review Board has to approve the study protocol. Each individual who took part in the research gave verbal informed permission. At all stages of the research, confidentiality and personal privacy were protected.

Data management and Statistical Analysis: Data was gathered using Microsoft Excel software throughout the history, basic clinical assessment, laboratory tests, and result assessments. The data was then loaded into the Statistical Package for the Social Sciences (SPSS version 20.0) software for analysis (SPSS Inc., Chicago, IL, USA).

RESULTS

The research was a prospective study to determine the prevalence of placenta accrete in prior caesarean section patients with placenta previa and the diagnostic test's accuracy, which evaluates the accuracy of each criterion of trans abdominal gray scale ultrasound, In comparing to one hundred control pregnant lady, MRI and maternal alpha fetoprotein were used to diagnose placenta previa accreta in one hundred pregnant women who had a clear detection of placenta accreta.

Adherent	(Previa&CS)Group (n=100)		Control Group (n=100)		P
	N	%	N	%	
Not Morbidly adherent placenta	82	82%	97	97 %	.002
Morbidly adherent placenta	18	18%	3	3%	
Accrete	12	66.6 %	2	66.6%	0.001
Increta	4	22.2 %	1	33.3%	
Percreta	2	11.1 %	0	0%	

Table 1: Adherent placenta types of the studied groups

There is a substantial variation between the two groups according to incidence of morbidly adherent placenta which shows high correlation with placenta accrete prevalence. Table (1)

	1 &2CS (n=2)	3 CS (n=4)	4 CS (n=5)	≥5 CS (n=7)	F	Morep
Age (years) Mean ± SD	29.11 ± 4.12	30.56 ± 4.31	33.7 ± 4.91	35.1 ± 4.12	8.9	.000
BMI (kg/m ²) Mean ± SD	26.29 ± 2.39	28.63 ± 3.67	30.12 ± 3.39	31.60 ± 1.84	13.8	.000
Parity Mean ± SD	2.15 ± 1.2	3.74 ± 1.12	3.81 ± 1.19	4.2 ± 1.92	25	.000
Gravidity Mean ± SD	2.43 ±.832	2.66 ± .724	2.88 ± .978	2.84 ± 1.15	2.7	.048

Table 2: Maternal characteristics and clinical data among CS group according to number of previous cesarean section

This table shows that there is a substantial variation between the groups according maternal age, BMI, parity and gravidity which has a direct impact on the incidence of placenta accrete. Table (2)

No. of P.C.S	Incidence of Placenta Accreta		
	accreta	Not accreta	Total
Previous 1 CS	No.	1	27
	%	5.5	32.9
Previous 2 CS	No.	1	23
	%	5.5	28.6
Previous 3 CS	No.	4	13
	%	22.3	15.8
Previous 4 CS	No.	5	11
	%	27.8	13.8
Previous 5 or more CS	No.	7	8
	%	38.9	8.9
Total	No.	18	82
	%	100.00	100.00
p-value	<0.0001		

Table 3: Relation between the number of previous cesarean section (P.C.S) and the prevalence of placenta accreta in all studied cases

This table shows that there is great substantial relation between number of previous cesarean section (P.C.S) and the incidence of placenta accreta in all studied cases (P-value < 0.0001). Table (3)

Previous 1 C.S (28 cases)	Incidence of Placenta Accreta		
	Accrete	Not accrete	Total
No operations	No.	0	20
	%	0.0	74
D&C	No.	1	3
	%	100	11.1
Myomectomy	No.	1	2
	%	100	7.4
Hysterescopy	No.	0	1
	%	0	3.7
Other operations	No.	0	1
	%	0	3.7
Total	No.	1	27
	%	100.00	100.00
p-value	< 0.0001		

Table 4: The effect of various gynecological operations in cases of prev.1 on the incidence of placenta accreta

This table shows that there is high significant relation between various gynecological operations in cases of prev.1 on the incidence of placenta accreta (P-value < 0.0001). Table (4)

Factor	Its varieties	Accreta group (n=18)		Not Accreta (n=82)		t ²	P
		N	%	N	%		
Number of previous cesareans	Previous 1	1	5.5	27	32.9	11	.0001
	Previous 2	1	5.5	23	28		
	Previous 3	4	22.2	13	15.8		
	Previous 4	5	27.8	11	13.4		
	Previous 5	7	38.9	8	9.7		
Number of Gynecological surgeries	Myomectomy	6	33.3	7	8.5	1.22	.271
	Hysteroscopy	5	27.7	8	9.7		
	Other operations	1	5.5	3	3.6		
Number of D&C		12	66.6	11	13.4	6.7	.009

Table 5: Comparison between the impact of CS number, type of surgery and Abortion on accreta prevalence of the studied patients

There is a substantial variation between the two groups according number of previous cesareans, and history of abortion, which has a direct proportional impact on the prevalence of placenta accreta. Table (5)

Complications	Accreta group (n=18)		Not Accreta (n=82)		P
	N	%	N	%	
Hysterectomy	2	11.1%	0	0%	.001
Adhesion	3	16.6%	6	7.3%	.000
Bladder injury	4	22.2%	0	0%	.318
Endometritis	1	5.5%	2	2.4%	.030
Wound infection	3	16.6%	4	4.8%	.001
Uterine Rapture	1	5.5%	1	1.2%	.315
Scar tenderness	4	22.2%	0	0%	.000
Hemorrhage	12	67%	1	1%	.097

Table 6: Complications distribution among accreta and non accrete groups:

There is a substantial variation between the two groups according hysterectomy, adhesion, endometritis, wound infection, andscar tenderness, which shows a noticeable correlation with accrete cases. Table (2)

Accreta Group (18 cases)	1&2 CS (n=2)	3 CS (n=4)	4 CS (n=5)	≥5 CS (n=7)	χ ²	P
Hysterectomy	0 (0%)	0 (0%)	1 (5.5%)	1 (5.5%)	12	.009
Adhesion	0 (0%)	0 (0%)	1 (5.5%)	2 (11.1%)	11	.010
Bladder injury	1 (1.6%)	0 (0%)	1 (5.5%)	2 (11.1%)	4.9	.177
Endometritis	0 (0%)	0 (0%)	0 (0%)	1 (5.5%)	6.1	1.07
Wound infection	1 (5.5%)	1 (5.5%)	0 (0%)	1 (5.5%)	3.8	.289
Uterine Rapture	0 (0%)	0 (0%)	0(0%)	1 (5.5%)	7.8	.049
Scar tenderness	0 (0%)	1 (5.5%)	1 (5.5%)	2 (11.1%)	29	.000
Hemorrhage	2 (11.1%)	2 (11.1%)	3 (16.7%)	5 (27.8%)	11	.012

Table 7: Maternal complications among accrete group according to number of previous cesarean section

There is a significant increasing occurrence of complications in Accreta cases with increasing number of CS. Table (7)

DISCUSSION

The goal of this work is to detect the incidence of morbidly adherent placenta among women with variety of numbers of previous cesarean sections.

Prospective cross-sectional research was carried out on pregnant women intended inpatient, outpatient and emergency of Sayed Galal gynaecological and obstetric hospital in the period of the 1st of August 2020 till the 1st of January 2021.

200 participants Cases were divided into 2 groups: Group (I): 100 who will be categorised according to

the number of CS they have done (CS group). Group (II): 100 who have no previous uterine scars (control group).

All processes involving human subjects in this research were carried out in line with the Alazhar university ethics committee's ethical standards and subsequent amendments, or equivalent ethical standards. All participants in the research gave their informed written permission.

Full history was taking; Body mass index (BMI), Laboratory tests of the investigated patients and data was evaluated statistically.

In our study regarding demographic characteristics of the studied groups, there was a substantial variation between the two groups according BMI ($p=0.011$) and gravidity ($p=0.025$), the mean BMI were $27.89 \pm 3.82 \text{ kg/m}^2$ in CS group and $26.68 \pm 2.75 \text{ kg/m}^2$ in no uterine scar group, the mean gravidity were 3.67 ± 1.62 in CS group and 3.16 ± 1.44 in no uterine scar group. While there was no substantial variation between the two studied groups according age, Parity and GA ($p>0.05$), the mean maternal age were 33.54 ± 4.13 years in CS group and 32.76 ± 4.52 years in no uterine scar group, the mean Parity were 2.1 ± 0.977 in CS group and 1.88 ± 1.04 in no uterine scar group.

In agreement with our study was a recent research by Tovbin et al.,⁷ noted that, During the trial, 268 patients were enrolled in total. The trial comprised 258 women after ten patients delivered elsewhere and was lost to follow-up. Twenty-three women (8.9%) were diagnosed with MAP, whereas 235 (91.1%) had no clinical indications of an attached placenta. The median gestational age at identification was 33.9 (range, 16–41) weeks, and the median mother age at ultrasound examination was 33.8 ± 4.5 years. The mean \pm SD for mother gravidity and parity were 4.0 ± 1.6 and 2.0 ± 1.2 , respectively. The average gestational age at birth was 37.7 ± 1.7 weeks (range: 24–41).

In a recent research Li et al.,⁸ showed that, the cases of severe PPH ranged in age from 24 to 38 years old, with 7 of them having concomitant adherence/placenta accreta (median 29). The gestational age at which the surgery was conducted varied from 36 weeks plus 1 day to 38 weeks plus 6 days, and parity ranged from 0 to 1. (Median 37 weeks plus 3 days).

The clinical characteristics of the studied patients in the current research revealed that, there is a substantial variation between the two groups in term of number of previous cesareans ($p=0.000$) and history of abortion ($p=0.009$), the majority of patients 38(38%) cases in CS group and 66(66%) cases in no uterine scar have one previous cesareans.

Along with our study were the results by Richa et al.,⁹ showed that, twenty women fit the criteria for diagnosis for MAP. Fourteen (70%) previously cesarean delivery scar, four (20%) had had prior curettage, but they all had a cesarean delivery history. Placenta previa was found in 14 (70%) of the women. Two of the women (10%) had no identified risk factors.

In the current investigation, the incidence of complications between the two groups revealed a substantial variation in hysterectomy ($p=0.001$), adhesion ($p=0.000$), endometritis ($p=0.030$), wound infection ($p=0.001$), and scar discomfort ($p=0.000$). However, there was no substantial variation between the two groups in terms of Bladder damage, Uterine Rapture, or Bleeding (p -values 0.318, 0.315, and 0.097, respectively), although there was a substantial variation in terms of morbidly adherent placenta ($p=0.024$).

In agreement with our study was a recent study by Wei et al.,¹⁰ studied 96 people diagnosed with MAP Following earlier CS findings indicating only three

women in the control group had hysterectomy compared to none in the study group, no peripartum mortality was observed in either group.

Recent research by Koroglu et al.,¹¹ showed that, there were no differences in parity, procedure time, hospital stay, or pre- and postoperative hemoglobin concentrations between the groups. The preceding CS and no CS groups had conversion rates of 2% and 1.7 percent, respectively, to laparotomy. Major problems occurred at a rate of 5% and 1.3 percent in the prior CS and no CS groups, respectively, and these outcomes did not vary substantially ($P > 0.05$).

Among total 26 studied cases Grönvall et al.,¹² reported that, twenty-five instances of placenta accreta were discovered, with one case of placenta praecreta. Sixteen (61.5%) of the AIP cases were discovered before birth. One AIP patient was a primiparous lady with no risk factors. Six of the 10 mothers with antenatally undetected AIP had mild PP. Thirteen of the 26 women (50 percent) suffered a life-threatening bleeding (2500 ml). In all, 15 hysterectomies were carried out. AIP was verified in all of these women after a histological study of a hysterectomy specimens, and 13 of them had a history of CS.

Richa et al.,⁹ noted that, the majority of the lady death in their research is due to intensive surgery, which involves significant blood transfusions, infections, and urologic damage. Women with MAP had a significant rate of hemorrhage problems, with a median blood loss of 2.7 l and transfusions of up to 19 U of blood and 21 U of FFPs.

Bhide et al.,⁹ reported that, the placenta fails to detach from the uterine wall owing to improper implantation at the basal plate, resulting in morbidly adhered placenta (MAP). Massive obstetric bleeding and its complications, including the requirement for blood transfusions, multiorgan failure, morbid hysterectomy, and even death, are common.

Maternal characteristics and clinical data among CS group according to number of previous cesarean section showed that there is a substantial disparity between the groups in term of maternal age, BMI, parity ($p=0.000$) and gravidity ($p=0.048$).

In a previous systematic review Marshall et al.,¹³ reported that, the risk of morbidly adherent placenta rose from 0.3 percent in women who had one prior cesarean birth to 6.74 percent in those who had five or more.

On the other hand, Koroglu et al.,¹¹ noted that, the groups were equivalent in terms of BMI, parity, surgical indications, operation time, and inpatient stay. Patients who had already had CS had received one CS, 25% had gotten two CSs, and 8% had received three CSs. In both groups, uterine myoma was the most common reason for surgery.

In the current study maternal complications among CS group according to number of previous cesarean section showed that, there was a substantial variation between the groups in term of hysterectomy, adhesion, uterine rapture, scar tenderness, and hemorrhage p -values were 0.009, 0.010, 0.049, 0.000 and 0.012 respectively.

Along with our study Morlando et al.,¹⁴ reported that, CS delivered 41 women, 23 of whom needed transfusions, three of whom were treated successfully with curettage, and 26 of whom required a hysterectomy. As an adjuvant therapy for bleeding following cesarean hysterectomy, one lady had her hypogastric artery ligated. Only uterine packing was used to effectively treat twelve patients. Thirty hysterectomies were performed. Histology verified the PA in nine instances (30%) (four increta, five percreta); in 14 cases, the histological result was negative (46 percent). Due to missing or damaged papers, seven of the early instances from the first triennia could not be evaluated. There were 13 primiparous women, three of whom gave birth vaginally, and CS was performed on ten of them for various obstetrical reasons. There were no maternal deaths reported.

In a previous study by Field and Haloob,¹⁵ A varieties of complications has become a direct result of increasing the rate of cesarean section which includes postpartum haemorrhage, sepsis, visceral injury, postoperative ileus, placenta previa and morbidly adherent placenta.

From all of the above, we can assume that the over-medicalization of the birth process in Egypt, as seen by the overuse of caesarean deliveries, is a serious public health problem that requires prompt attention because to the excessive pressure CS causes on the health system.

The rise in CS rates is due to a mix of medical and non-medical reasons. However, several studies imply that a significant proportion of CS births occurred without clear medical rationale. In the study hospitals, health care provider characteristics seem to be major contributors determining CS rates.

CONCLUSION

Overmedicalization of the birth process in Egypt, as seen by the overuse of cesarean delivery, is a serious public health problem that requires prompt attention because to the excessive pressure CS causes on the health system. Evidence-based interventions addressing these factors, including disseminating delivery procedures and practice guidelines, training providers in VBAC, and improving hospitals' monitoring and supervision systems, are essential to minimize this potentially avoidable surgical procedure that poses different risks to mothers and babies.

Conflict of interest : none

REFERENCES

1. S. Elnakib, N. Abdel-Tawab, D. Orbay, and N. Hassanein, "Medical and non-medical reasons for cesarean section delivery in Egypt: a hospital-based retrospective study," *BMC pregnancy and childbirth*. 2019; vol. 19, no. 1, pp. 1-11,.
2. A. C. Rossi, R. H. Lee, and R. H. Chmait, "Emergency postpartum hysterectomy for uncontrolled postpartum bleeding: a systematic review," *Obstetrics & Gynecology*. 2010; vol. 115, no. 3, pp. 637-44.
3. E. H. Yeung, A. Saha, C. Zhu, M. H. Trinh, S. N. Hinkle, A. Z. Pollack *et al.*, "Placental characteristics and risks of maternal mortality 50 years after delivery," *Placenta*. 2022; vol. 117, pp. 194-9.
4. A. M. Saleh, J. W. Dudenhausen, and B. Ahmed, "Increased rates of cesarean sections and large families: a potentially dangerous combination," *Journal of Perinatal Medicine*. 2017; vol. 45, no. 5, pp. 517-21.
5. C. S. Shellhaas, S. Gilbert, M. B. Landon, M. W. Varner, K. J. Leveno, J. C. Hauth *et al.*, "The frequency and complication rates of hysterectomy accompanying Cesarean delivery," *Obstetric Anesthesia Digest*. 2010; vol. 30, no. 3, pp. 153-4.
6. F. D'Antonio, C. Iacovella, and A. Bhide, "Prenatal identification of invasive placentation using ultrasound: systematic review and meta-analysis," *Ultrasound in Obstetrics & Gynecology*. 2013; vol. 42, no. 5, pp. 509-17.
7. J. Tovbin, Y. Melcer, S. Shor, M. Pekar-Zlotin, S. Mendlovic, R. Svirsky *et al.*, "Prediction of morbidly adherent placenta using a scoring system," *Ultrasound in Obstetrics & Gynecology*. 2016; vol. 48, no. 4, pp. 504-10.
8. G. T. Li, X. F. Li, J. Li, Y. J. Liu, and H. M. Xu, "Reflexed compression suture for the management of atonic postpartum hemorrhage with an abnormally adherent placenta," *Gynecologic and Obstetric Investigation*. 2015; vol. 80, no. 4, pp. 228-33.
9. Richa A, Amita S, Bala VN, Ponam Y, Abha S, Kiran M. Morbidly Adherent Placenta: A Critical Review. *The Journal of Obstetrics and Gynecology of India*. 2012; 62 (1):57-61
10. Y. Wei, Y. Cao, Y. Yu, and Z. Wang, "Evaluation of a modified "Triple-P" procedure in women with morbidly adherent placenta after previous cesarean section," *Archives of Gynecology and Obstetrics*. 2017; vol. 296, no. 4, pp. 737-43.
11. N. Koroglu, B. A. Cetin, G. Turan, G. Y. Yildirim, A. Akca, and A. Gedikbasi, "Characteristics of total laparoscopic hysterectomy among women with or without previous cesarean section: retrospective analysis," *Sao Paulo Medical Journal*. 2018; vol. 136, pp. 385-9.
12. M. Grönvall, V. Stefanovic, J. Paavonen, M. Loukovaara, and M. Tikkanen, "Major or minor placenta previa: Does it make a difference?," *Placenta*. 2019; vol. 85, pp. 9-1,.
13. N. E. Marshall, R. Fu, and J.-M. Guise, "Impact of multiple cesarean deliveries on maternal morbidity: a systematic review," *American journal of obstetrics and gynecology*. 2011; vol. 205, no. 3, pp. 262-e1.
14. M. Morlando, L. Sarno, R. Napolitano, A. Capone, G. Tessitore, G. M. Maruotti *et al.*, "Placenta accreta: incidence and risk factors in an area with a particularly high rate of cesarean section," *Acta obstetrica et gynecologica Scandinavica*. 2013; vol. 92, no. 4, pp. 457-60.
15. A. Field and R. Haloob, "Complications of cesarean section," *The Obstetrician & Gynaecologist*. 2016; vol. 18, no. 4, pp. 265-72.