OCCURANCE OF ACUTE RENAL FAILURE AND HYPOVOLEMIC SHOCK IN PATIENTS WITH RETAINED PLACENTA

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Abstract

Introduction: Retained placenta is considered as one of the important causes of postpartum hemorrhage (primary and secondary). It may lead to complications such as renal failure and shock. Objective: To determine the occurrence of acute renal failure and hypovolemic shock in patients of retained placenta. Outcome measure: Frequency of ARF and hypovolemic shock. Study design: Cross sectional study. Setting: Department of Obstetrics and Gynecology Shaikh Zaid Women Hospital Larkana

Subjects: Patients with age group (18-40 years) admitted in labor room were included. Women with renal stone or infections, receiving nephrotoxic drugs and pre-eclampsia were excluded.

Methods: Patients meeting the inclusion criteria will be included after written informed consent. A detailed history and examination were done. Patients were labeled as suffering from hypovolemic shock, if they have pulse rate >100 and systolic BP<100mmHg in presence of any one Cold peripheries, Decrease capillary retiling (<3 sec). Patients were suffering from ARF, if she has loss of renal function i.e., elevated (about baseline which is 10-40 mg/dl) and creatinine (about baseline which is 0.4-1.6 mg/dl) along with oliguria (i.e., 24hrs U.O.P <400ml). The analysis of data was done with the use of SPSS version 10.

Results: The mean age of included participants is 29.8±5 years. From 307 patients, primiparity accounted for 117 (38%), parity 2-3 for 135 (44%) and parity 4-5 for 55 (18%) cases. The systolic blood pressure of 145 (47.2%) patients was <100 mmHg and in 162 (52.8%) patients was >100 mmHg. A total of 299 (97.4%) patients has urine output of >400 ml in 24 hours and 8 (2.6%) cases have urine output of <400 ml in 24 hours. Of 307 patients 10 (3.2%) had acute renal failure and 69 (22.5%) had shock.

Conclusions: From this study, it was observed that the frequency of ARF and hypovolemic shock is high in patients with retained placenta.

Keywords: Retained placenta, acute renal failure, hypovolemic shock.

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Introduction

The retained placenta is very important cause of postpartum hemorrhage (PPH); both primary and secondary and are related with high risk of maternal mortality and morbidity. Retained placenta is referred as placenta delivery failure within 30 min; and affects 0.5-3% of females following delivery of baby. About 25% of hemorrhage occurs because of hemorrhage during pregnancy period, birth period or postpartum period, and 30% are associated with PPH1. An additional 15%-20% of such PPH deaths in maternal period are caused by retained placenta.

There are three key categories of retained placenta followed by the vaginal delivery (adherence of placenta due to failed myometrial contraction behind placenta), the trapped placenta (detached placenta entombed behind close cervix) and partial accretes (where there is slight zone of accrete that prevents detachment)1,2. The retained placenta has many causes including congenital uterine malformation, uterine inertia, morbidly adherent placenta, adherence of membranes to uterine wall, and contracted cervix. The retained placenta is linked with high risk of hypovolemic shock (22.2%) and acute renal failure (3.3%)3.

Treatment of retained placenta starts with intravenous or intra umbilical injection of one or more uterotonic drugs/agents, e.g., methylergometrine or oxytocin, that persuade contraction of uterus in strong and rhythmic manner. There is also recommendation to perform Dorm – Ahlferd or Crede maneuver4,5. Recent therapy of retained placenta is the removal of placenta manually under anesthesia, which can take place only in bigger health centers. Medical treatment for retained placenta using prostaglandin E2 (misoprostol) may be cost effective option in many 100 resources setting.6 Tocolytics (agents that reduce the tone and contractility of uterus, have been used isolated or in combination with uterotonic agents for the management of retained placenta.2,7

Statistic about retained placenta and its complications in Pakistan are lacking to show the strength of this problem. The objective of this study is to see the occurrence of acute renal failure and

Material and methods

Study design: Cross sectional study

Study setting: Department of obstetrics and gynecology Shaikh Zaid Women Hospital Larkana (tertiary care hospital)

Study duration: 6 months after approval of synopsis.

Sample size: The sample size was calculated by using WHO sample size calculator, taking confidence level = 95%

Anticipated population proportion = 3.3%

Absolute precision requires: 2%

Sample size = 307

Sample technique: Consecutive Sampling

SAMPLE SELECTION: -

Inclusion criteria: Patients with age group (18-40 years) admitted in labour room at Shaikh Zaid Women Hospital Larkana.

Exclusion Criteria:

- Presence of renal stone / infection.
- Patients receiving nephrotoxic drugs during or before admission to hospital.
- Patients having or developed pre-eclampsia.

DATA COLLECTION: -

After the approval of ethical committee of SMBBMU, written informed consent was taken from all participants fulfilling the inclusion criteria were strictly followed to limit the confounding variables. A detailed clinical examination of every patient was taken including physical abdominal and pelvic examination. Information regarding age, parity, vital events were taken, and blood pressure and pulse rate was recorded.

Patients were labeled as suffering from hypovolemic shock, if they have pulse rate >100 and systolic BP<100mmHg in presence of any one Cold peripheries, Decrease capillary retiling (<3 sec). Postural hypotension or Increase thirst. Similarly, the information regarding status of uterus, cervical O.S, bleeding per vagina as mild, moderate and server and U.O.P in 24 hours as < 400ml and> 400ml was recorded. Patients were suffering from ARF, if she has loss of renal function i-e elevated (about baseline which is 10-40 mg/dl) and creatinine (about baseline which is 0.4-1.6 mg/dl) along with oliguria (i.e., 24hrs U.O.P <400ml). Ultrasound was performed to confirm retained placenta. Blood and urine samples were taken for urea and creatinine. 24 hours urine was collected and monitor. All this data was recoded and collected through especially designed Performa attached hereby.

DATA ANALYSIS: -

The collected data was entered and analyzed by SPSS v.10. Descriptive statistics were used to calculate mean and standard deviation for variables that were quantitative in nature, i.e. age, parity, time of delivery, urea and Creatinine, and frequencies with percentages for Qualitative variables i.e. blood pressure (>100 mmHg and <100 mmHg), Pulses (<100 b/m and > 100 b/min), status of uterus, cervical O.S. bleeding per vagina as(mild, moderate and sever), U.O.P in 24 hours as (<400ml and >400ml), acute renal failure and hypovolemic shock. Stratification was used to rectify the effect modifiers like parity, and previous history of c/section.

Results

Total of 307 patients participated in this study. The mean age

of participants was 29.8±5 years (Figure 1). Of 307 patients, primiparity accounted for 117 (38%), parity 2-3 for 135 (44%) and parity 4-5 accounted for 55 (18%) cases (Figure 2). The systolic blood pressure of 145 (47.2%) patients was <100 mmHg and in 162 (52.8%) patients was >100 mmHg (Figure 3). The pulse of 204 (66.5%) patients was <100 beats per minute and in 103 (33.5%) patients was >100 beats per minute (Figure 4).

The mild vaginal bleeding was present in 216 (70.4%) cases, moderate vaginal bleeding in 73 (23.8%) cases and severe vaginal bleeding in 18 (5.9%) cases (Figure 5). A total of 299 (97.4%) patients has urine output of >400 ml in 24 hours and 8 (2.6%) cases have urine output of <400 ml in 24 hours (Figure 6). Overall, 78 (25.4%) patients had previous cesarean section (Figure 7). Of 307 patients 10 (3.2%) had acute renal failure and 69 (22.5%) had shock (Figure 8).

Stratification of acute renal failure by parity: The frequency of acute renal failure in patients of primiparity was 6.8% and is statistically significant p-0.02 (Table 1). Stratification of acute renal failure by previous history of C-section: The frequency of acute renal failure in patients having previous cesarean section was 9%% and is statistically significant p-0.003 (Table 2). Stratification of shock by parity: The frequency of shock in patients of primiparity was 26.5% and is statistically not significant p-0.38 (Table 3). Stratification of shock by previous history of C-section: The frequency of shock in patients having previous cesarean section was 34.6% and is statistically significant p-0.003 (Table 4).

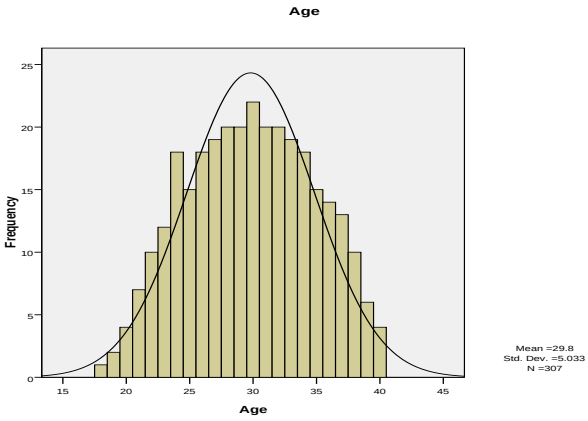

Figure 1: AGE DISTRIBUTION OF ENROLLED PARTICIPANTS (n=307)

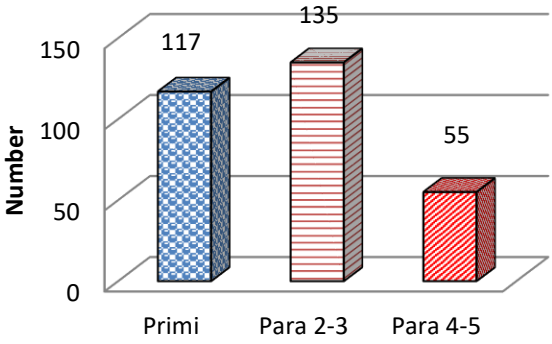

Figure 2: DISTRIBUTION OF PARITY AMONG ENROLLED PARTICIPANTS (n=307)

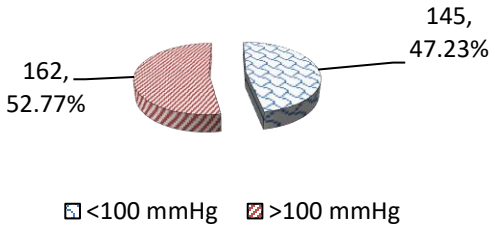

Figure 3: DISTRIBUTION OF SYSTOLIC BLOOD PRESSURE IN ENROLLED PARTICIPANTS (n=307)

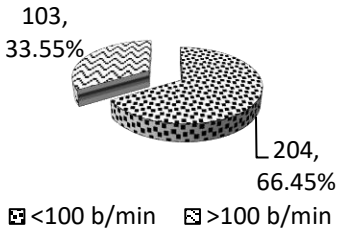

Figure: 4 DISTRIBUTION OF PULSE IN ENROLLED PATIENTS (n=307)

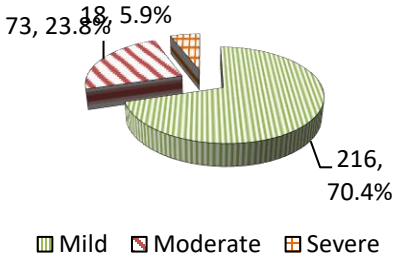

Figure: 5 FREQUENCY OF SEVERITY OF VAGINAL BLEEDING IN ENROLLED PARTICIPANTS (n=307)

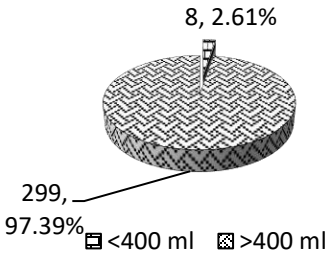

Figure: 6 FREQUENCY OF 24 HOUR URINE PARTICIPANTS OF ENROLLED PARTICIPANTS (n=307)

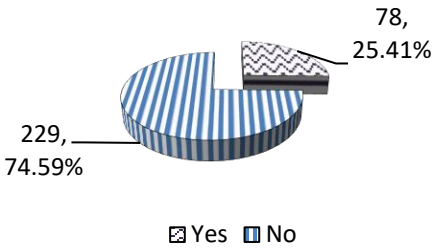

Figure: 7 FREQUENCY OF PREVIOUS CESAREAN SECTION (n=307)

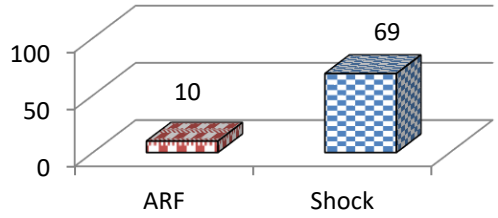

Figure: 8 FREQUENCY OF ACUTE RENAL FAILURE AND SHOCK IN ENROLLED PARTICIPANTS (n=307)

Table 1: STRATIFICATION OF ACUTE RENAL FAILURE BY PARITY

ARF*	Parity			Total
	Primiparity	Para 2-3	Para 4-5	
Yes	8 (6.8%)	1 (0.7%)	1 (1.8%)	10
No	109 (93.2%)	134 (99.3%)	54 (98.2)	297
Total	117	135	55	307

*ARF-Acute renal failure

P-value: 0.02

Table 2: STRATIFICATION OF ACUTE RENAL FAILURE BY HISTORY OF PREVIOUS CESEREAN SECTION

ARF*	Previous history of cesarean section		Total
	Yes	No	
Yes	7 (9%)	3 (1.3%)	10
No	71 (91%)	226 (98.7%)	297
Total	78	229	307

*ARF-Acute renal failure

P-value: 0.003

Table 3: STRATIFICATION OF SHOCK BY PARITY

Shock	Parity			Total
	Primiparity	Para 2-3	Para 4-5	
Yes	31 (26.5%)	26 (19.3%)	12 (21.8%)	69
No	86 (73.5%)	109 (80.7%)	43 (78.2)	238
Total	117	135	55	307

P-value: 0.38

Table 4: STRATIFICATION OF SHOCK BY HISTORY OF PREVIOUS CESEREAN SECTION

Shock	Previous history of cesarean section		Total
	Yes	No	
Yes	27 (34.6%)	42 (18.3%)	69
No	51 (65.4%)	187 (81.7%)	238
Total	78	229	307

P-value: 0.003

Discussion

Globally, more than half a million females die due to pregnancy- and childbirth-related complications and 99% of such births occurs in developing nations. Approximately 25% of maternal mortalities are because of hemorrhage and 10-15% of such maternal mortalities are associated to retained placenta particularly in rural or semi-urban areas where deliveries are practices by untrained birth assistants 1, 2. When retained placenta is left unmanaged, there is an increased risk of maternal mortality1,8,9.

This state is supposed to complicate 0.6 – 3.3% of regular deliveries. Various cases of acute renal failure and shock are related to retained placenta10. When there is informal contact to hospital care and facilities of transfusion, morbidity, and mortality due to this situation could be reduced. Research from developed countries showed that no deaths happened from hemorrhage associated to modest retained placenta, although deaths occurred due to inversion of placenta, placenta accreta or complications of therapy11-15.

The similar cannot be estimated from developing nations. In a Northern Nigerian hospital, the rate of mortality was 3% among 894 females treated for the retained placenta for a three- and half-year time. The reason of mortality in these patients is typically hemorrhage16.

Generally, patients from this condition give a clinical history of protracted labor, injection of oxytocin, intrauterine manipulation, or former history of retained placenta17-19. The occurrence of placenta percreta has been on the upsurge throughout the past years, coextensive with the growth in deliveries by caesarean section1,20. The placenta percreta may show as an acute abdomen during pregnancy.3 Diagnosis in antenatal period is necessary for placenta percreta with bladder invasion, to achieve multi-disciplinary approach of this possibly shattering disorder21-24. The patients may show the symptoms of shock because of severe postpartum hemorrhage (PPH)25.

Homozygous sickle cell disease, history of past deliveries by caesarian section, precipitate labor, and grand multiparity, all are related with a high risk of retained placenta.5-9 The retained placenta relates to a high risk of anemia, post-partum hemorrhage, infection, and hypovolemic shock.

Conservative treatment of adherent placenta upsurges the mortality in females but is still an alternate to hysterectomy when central defects are seen, loss of blood is not extreme, and conservation of fertility is essential26-29.

In this study, the average age of enrolled patients is 29.8±5 years and 68% falls between age group 25-35 years of age. Similarly, Rizwan et al reported that retained placenta was observed more frequently in females of younger ages amongst 26-30 years. In another study done in Nepal Medical College Teaching Hospital reported that 57.9% relate to the age between 20-25 years.

Of 307 patients, primiparity accounted for 117 (38%), parity 2-3 for 135 (44%) and parity 4-5 accounted for 55 (18%) cases. Similarly, in Nepal women (35.2%) were primiparity had retained placenta. Rizwan et al reported that Incidence of retained placenta was elevated in females of decreased parity 44.4%.

The systolic blood pressure of 145 (47.2%) patients was <100 mmHg and in 162 (52.8%) patients was >100 mmHg. The pulse of 204 (66.5%) patients was <100 beats per minute and in 103 (33.5%) patients was >100 beats per minute. The mild vaginal bleeding was present in 216 (70.4%) cases, moderate vaginal bleeding in 73 (23.8%) cases and severe vaginal bleeding in 18 (5.9%) cases. A total of 299 (97.4%) patients has urine output of >400 ml in 24 hours and 8 (2.6%) cases have urine output of <400 ml in 24 hours. This concluded that patients with ARF and shock has low blood pressure, rapid pulse, and low urine output30.

Occurrence of injured endometrium triggered by prior caesarean section deliveries, sepsis, and uterine instrumentation are a significant risk factor as it raises the probabilities of morbid uterine atony and adherence31. In this study, 78 (25.4%) patients had previous cesarean section.

Of 307 patients 10 (3.2%) had acute renal failure and 69 (22.5%) had shock. Similarly, Rizwan et al reported 3.3% case of ARF and 22.2% cases of hypovolemic shock32. In a study in Sudan reported that 25% women with retained placenta went into hypovolemic shock5,33-34.

The incidence of acute renal failure in patients of primiparity was 6.8% and is statistically significant p-0.02 and in patients having previous cesarean section was 9%% and is statistically significant p-0.003. The frequency of shock in patients of primiparity was 26.5% and is statistically not significant p-0.38 and in patients having previous cesarean section was 34.6% and is statistically significant p-0.003. This indicates that patients with primiparity and history of cesarean section were at high risk for ARF, and shock should be monitored carefully35.

Conclusion

It was concluded from study that acute renal failure and hypovolemic shock are main features associated with postpartum hemorrhage and retained placenta. The occurrence of acute renal failure in patients of primiparity was seen and is statistically significant. The occurrence of acute renal failure in patients having previous cesarean section was 9%% and is statistically significant.

References

1. Rizwan N, Abassi RM, Jatoi N. Retained placenta still a continuing cause of mortality and morbidity. J Pak Med Assoc. 2009;59(12):812-4.
2. Abdul Aleem H, Abdul Aleem MA, Shaaban OM. Tocelyus for managerial of retained placenta. Cochrane Data bare of systemic. Review. 2009;3:432.
3. Owdasi AT, Dare FO, Fasubaa OB, Ogunlola, Kuti O, Bisiriya LA, et

al. Risk factors for retained placenta in south western Nigera. Singapore Med J. 2008;49:532-7.
4. Weeks AD. The retained placenta. Bert Proct Res Obstet/Gynae Col. 2008;22:1103-17.
5. Habek D, Franicevic D. Intra umbilical injection for retained placenta. Int J Gynea Obstet. 2007;99:105-9.
6. Beedhuizer HJV. Pembe AB, Fautek H, Lotgerng FK. Treatment of retained placenta with misoprosil: A randomized controlled trial in low resource setting(tarzoni). BMC Pregnancy and Child Birth. 2009;9:48.
7. Lutomski J, Byrne B, Devane D, Greene R. Increasing trends in atonic postpartum haemorrhage in Ireland: an 11-year population-based cohort study. BJOG. Feb 2012;119(3):306-14.
8. Jackson KW Jr, Allbert JR, Schemmer GK, Elliot M, Humphrey A, Taylor J. A randomized controlled trial comparing oxytocin administration before and after placental delivery in the prevention of postpartum hemorrhage. Am J Obstet Gynecol. Oct 2001;185(4):873-7.
9. Sheiner E, Sarid L, Levy A, Seidman DS, Hallak M. Obstetric risk factors and outcome of pregnancies complicated with early postpartum hemorrhage: a population-based study. J Matern Fetal Neonatal Med. Sep 2005;18(3):149-54.
10. Blomberg M. Maternal obesity and risk of postpartum hemorrhage. Obstet Gynecol. Sep 2011;118(3):561-8.
11. Society of Obstetrics and Gynecology of Canada. Postpartum hemorrhage. In: ALARM Manual. 15th Ed. 2008.
12. Rogers MS, Yuen PM, Wong S. Avoiding manual removal of placenta: evaluation of intra-umbilical injection of uterotonics using the Pipingas technique for management of adherent placenta. Acta Obstet Gynecol Scand. 2007;86(1):48-54.
13. Marquette GP, Skoll MA, Dontigny L. A randomized trial comparing oral misoprostol with intra-amniotic prostaglandin F2alpha for second trimester terminations. J Obstet Gynaecol Can. Nov 2005;27(11):1013-8.
14. James AH, Kouides PA, Abdul-Kadir R. Von Willebrand disease and other bleeding disorders in women: Consensus on diagnosis and management from an international expert panel. Am J Obstet Gynecol. May 28 2009;
15. Khan GQ, John IS, Wani S, Doherty T, Sibai BM. Controlled cord traction versus minimal intervention techniques in delivery of the placenta: a randomized controlled trial. Am J Obstet Gynecol. Oct 1997;177(4):770-4.
16. McDonald S, Abbott JM, Higgins SP. Prophylactic ergometrine-oxytocin versus oxytocin for the third stage of labour. Cochrane Database Syst Rev. 2004;(1):CD000201.
17. Choi PT, Yip G, Quinonez LG, Cook DJ. Crystalloids vs. colloids in fluid resuscitation: a systematic review.Crit Care Med. Jan 1999;27(1):200-10.
18. Roberts I, Alderson P, Bunn F, Chinnock P, Ker K, Schierhout G. Colloids versus crystalloids for fluid resuscitation in critically ill patients. Cochrane Database Syst Rev. Oct 2004;18:(4):CD000567.
19. Hewitt PE, Machin SJ. Massive blood transfusion. In: ABC or Transfusion. London, England: BMJ Publishing; 1998:49-52.
20. Hughes DB, Ullery BW, Barie PS. The contemporary approach to the care of Jehovah's witnesses. J Trauma. Jul 2008;65(1):237-47.
21. Atoyebi W, Mundy N, Croxton T, Littlewood TJ, Murphy MF. Is it necessary to administer anti-D to prevent RhD immunization after the transfusion of RhD-positive platelet concentrates?. Br J Haematol. Dec 2000;111(3):980-3.
22. Franchini M, Franchi M, Bergamini V, Salvagno GL, Montagnana M, Lippi G. A critical review on the use of recombinant factor VIIa in life-threatening obstetric postpartum hemorrhage. Semin Thromb Hemost. Feb 2008;34(1):104-12.
23. Ahonen J, Jokela R, Korttila K. An open non-randomized study of recombinant activated factor VII in major postpartum haemorrhage. Acta Anaesthesiol Scand. Aug 2007;51(7):929-36.
24. Franchini M, Manzato F, Salvagno GL, Lippi G. Potential role of recombinant activated factor VII for the treatment of severe bleeding associated with disseminated intravascular coagulation: a systematic review.Blood Coagul Fibrinolysis. Oct 2007;18(7):589-93.
25. O'Brien P, El-Refaey H, Gordon A, Geary M, Rodeck CH. Rectally administered misoprostol for the treatment of postpartum hemorrhage unresponsive to oxytocin and ergometrine: a descriptive study.Obstet Gynecol. Aug 1998;92(2):212-4.
26. Lokugamage AU, Sullivan KR, Niculescu I. A randomized study comparing rectally administered misoprostol versus Syntometrine combined with an oxytocin infusion for the cessation of primary post partum hemorrhage. Acta Obstet Gynecol Scand. Sep 2001;80(9):835-9.
27. Vaid A, Dadhwal V, Mittal S, Deka D, Misra R, Sharma JB. A randomized controlled
28. Cheung WM, Hawkes A, Ibish S, Weeks AD. The retained placenta: historical and geographical rate variations. J Obstet Gynaecol. 2011;31:37.
29. Hidar S, Jennane TM, Bouguizane S. The effect of placental removal method at cesarean delivery on perioperative hemorrhage: a randomized clinical trial ISRCTN 49779257. Eur J Obstet Gynecol Reprod Biol. 2004;117:179.
30. Endler M, Grünewald C, Saltvedt S. Epidemiology of retained placenta: oxytocin as an independent risk factor. Obstet Gynecol. 2012;119:801.
31. Green LK, Harris RE. Uterine anomalies. Frequency of diagnosis and associated obstetric complications. Obstet Gynecol. 2006;47:427.
32. Golan A, Raziel A, Pansky M, Bukovsky I. Manual removal of the placenta--its role in intrauterine adhesion formation. Int J Fertil Menopausal Stud. 2006;41:450.
33. Herman A, Weinraub Z, Bukovsky I. Dynamic ultrasonographic imaging of the third stage of labor: new perspectives into third-stage mechanisms. Am J Obstet Gynecol. 2003;168:1496.
34. Deyer TW, Ashton-Miller JA, Van Baren PM, Pearlman MD. Myometrial contractile strain at uteroplacental separation during parturition. Am J Obstet Gynecol. 2000;183:156.
35. Gülmezoglu, AM, Widmer, M, Merialdi, M, Qureshi, Z, Piaggio, G, Elbourne, D, et al. Active management of the third stage of labour without controlled cord traction: a randomized non-inferiority controlled trial. Reprod Health. 2009;21:6:2.