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Original Article

Effects of Fu Fang Yi Mu Cao capsules combined with Yiqi Xiaoyu decoction on lochia

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Abstract: Objective: To investigate the effects of Fu Fang Yi Mu Cao (FFYMC) capsules combined with Yiqi Xiaoyu (YX) decoction on persistent lochia after birth. Methods: In this retrospective analysis, 120 patients with lochia treated in our hospital from January 2014 to October 2020 were enrolled as study subjects. Sixty of each were randomly allocated into the study group (60 cases, treated with FFYMC capsules and YX decoction) and the control group (60 cases, treated with YX decoction). The two groups were compared in terms of efficacy, volume of lochia and changes in Traditional Chinese Medicine Syndrome Score (TCMSS) before and after intervention, and the incidence of adverse reactions. Results: (1) The total effective rate in the study group was 100.00%, which was significantly higher than that in the control group (P<0.05); (2) The difference in volume of lochia between two groups before the intervention was not statistically significant (P>0.05), and was significantly lower in the study group than in the control group at day 4 and day 7 of the intervention (P<0.05); (3) The difference in TCMSS between two groups before the treatment was not statistically significant (P>0.05). TCMSS was lower in the study group than in the control group after treatment (P<0.05); (4) The decreased height of uterine fundus in the study group was higher than that in the control group at 5 d after treatment (P<0.05); (5) The plasma viscosity in the study group was significantly lower than that in the control group (P<0.05); (6) The total incidence of adverse reactions in the study group was 8.33%, which was not significantly different from the control group which was 11.67% (P>0.05). Conclusion: FFYMC capsule and YX decoction could improve the treatment effect for primiparas with lochia in terms of reducing volume of lochia and improving clinical symptoms with high safety.

Keywords: Fu Fang Yi Mu Cao capsules, Yiqi Xiaoyu decoction, lochia, clinical study

Introduction

There are about 20 million primiparas in China every year, of whom 70% will experience different degrees of uterine subinvolution, which is named lochia in Chinese medicine [1, 2]. Generally, lochia that lasts for more than 10 days is defined as "persistent lochia". In obstetrics, lochia is the vaginal discharge after giving birth, containing blood, mucus, and uterine tissue, which occurs during the healing of the uterine wall after the placenta is detached from the uterine wall [3, 4]. Mothers with lochia often experience varying degrees of abdominal pain and fever, which can severely impact on their postpartum recovery. Lochia may affect breastfeeding and, in severe cases, even the nutritional intake of the newborn [5].

Traditional treatment options for lochia include curettage and administration of uterine constrictors. However, these procedures may cause greater trauma to the mother or may induce damage to the endometrium of the uterus, bringing huge psychological burden on mothers [6]. Traditional Chinese medicine believes that it is caused by malfunction of qi and blood and hematometra, therefore, should be treated by improving blood circulation and transforming stasis. Treatment option of Chinese medicine has become a hotspot in the treatment of lochia [7]. Both FFYMC capsules combined with YX decoction are traditional Chinese formulas. The effectiveness of these two drugs in eliminating stasis, promoting blood circulation, and regulating menstruation was confirmed [8]. The aim of this study was to investigate the feasibility of FFYMC capsules combined with YX decoction in treating lochia, providing clinical reference for improving the prognosis of women with lochia.

Materials and methods

General information

In this retrospective analysis, a total of 120 patients with postpartum lochia who were treated in our hospital from January 2014 to October 2020 were enrolled as the study subjects, and they were divided into study groups according to the study group (60 cases, FFYMC capsules combined with YX Decoction) and the control group (60 cases, YX Decoction) according to treatment regimen. This study was approved by Ethics Committee of Xingtai People's Hospital [No. 2019(035)].

Inclusion criteria: (1) patients with clear consciousness that can cooperate with the study; (2) patients with age between 21-40 years old; (3) patients with gestational age ≥37 weeks; (4) singleton mothers; (5) patients who met the diagnostic criteria for lochia in Obstetrics and Gynecology, Chinese Gynecology [9, 10].

Exclusion criteria: (1) patients with concurrent psychiatric disorders; (2) patients with concurrent cardiovascular, hepatic, renal or hematopoietic disorders; (3) patients with concurrent cervical lesions; (4) patients with critical condition such as massive blood loss and shock during delivery; (5) patients who underwent total or secondary hysterectomy; (6) patients with endometritis or pelvic inflammatory disease; (7) patients with poor compliance; (8) patients who did not take medication as prescribed.

Intervention methods

In the control group, the mothers were treated with YX decoction with formula as follows: Astragali Radix 19 g, Cimicifuga foetida 19 g, Fructus Hordei Germinatus 14 g, Poria 14 g, Codonopsis Radix 14 g, Crataegus pinnatifida 11 g, Galli Gigeriae Endothelium Corneum 9 g, Sparganii Rhizoma 9 g, Curcumae Rhizoma 9 g, Atractylodes macrocephala 9 g, Aurantii Fructus Immaturus 9 g, Chuanxiong Rhizoma 9 g, Bupleuri Radix 9 g, Carthamus tinctorius L 8 g. One dosage of decoction was prepared every day, and was administrated in the morning and evening, respectively; In the study group, the mothers were additionally treated with FFYMC Capsules (Manufacturer: Jiangxi Doctora Pharmaceutical Co., Ltd., specification 0.4 g/capsule, Z20040012), b.d. 2-3 capsules per time; Both groups were observed for 7 days.

Observation indicators

The four indicators were observed. (1) The treatment efficacy was divided into four categories: cured, markedly effective, effective and ineffective. Cured: disappearance of lochia within 0-3 d after treatment. Markedly effective: disappearance of lochia after 4-5 d of treatment. Effective: disappearance of lochia after 6-7 d of treatment; Ineffective: persistent lochia after 7 d of treatment. Effective rate = (cure + markedly effective + effective)/total number of cases ×100%. (2) The volume of lochia was compared between two groups before, 4 days and 7 days after treatment. The volume of lochia was measured by using the weight of the used puerperal pad minus the weight of the dry puerperal pad, with 1 g weight of lochia converting to 1 mL. (3) TCMSSs before and after intervention were compared between two groups according to "Clinical research guidelines for treatment of lochia with new Chinese medicine" [11] regarding blood quality, vaginal bleeding volume, blood color, complexion and abdominal pain using a 0-3 score scale, with higher scores representing more severe symptoms. (4) The height of the uterine fundus was measured at day 1, day 3 and day 5 after treatment (distance from superior margin of the symphysis pubis to fundus; the height of uterine fundus measured before minus the height on the day is the decreased height of the uterine fundus). (5) Hemorheological indices: the plasma viscosity and erythrocyte sedimentation rate were recorded before and after treatment, and the differences between and within groups were compared. (6) The incidence of adverse reactions, including nausea and vomiting, skin pruritus and abnormal liver and kidney function in two groups were compared.

Statistical methods

The collected data were analyzed using statistical SPSS 22.0. The count data were expressed as [n (%)] and compared using the chi-square test. The measurement data conform-

Table 1. Comparison of baseline data ($\bar{x}$±s)/[n (%)]

General information		Study group (n=60)	Control group (n=60)	t/X^2	*P*
Mean age (years)		28.19±2.11	28.21±1.98	0.054	0.957
Mean gestational weeks (weeks)		38.78±1.28	38.91±1.18	0.578	0.564
Average weight (kg)		70.29±2.39	70.32±2.29	0.07	0.944
Average height (cm)		163.28±10.22	164.11±9.98	0.45	0.654
Average number of pregnancies (times)		1.29±0.32	1.31±0.29	0.359	0.72
Average number of delivery (times)		1.12±0.34	1.11±0.29	0.173	0.863
High blood pressure	Yes	8	9	0.069	0.793
	No	52	51		
Diabetes	Yes	10	9	0.063	0.803
	No	50	51		
Mode of delivery	Vaginal	34	36	0.137	0.711
	C-section	26	24		

Table 2. Comparison of clinical effectiveness between two groups [n (%)]

Group	Number of cases	Cure	Markedly effective	Effective	Ineffective	Total effective rate
Study group	60	36 (60.00)	6 (10.00)	18 (30.00)	0 (0.00)	60 (100.00)
Control group	60	20 (33.33)	20 (33.33)	16 (26.67)	4 (6.67)	56 (93.33)
X^2	-	-	-	-	-	4.138
P	-	-	-	-	-	0.042

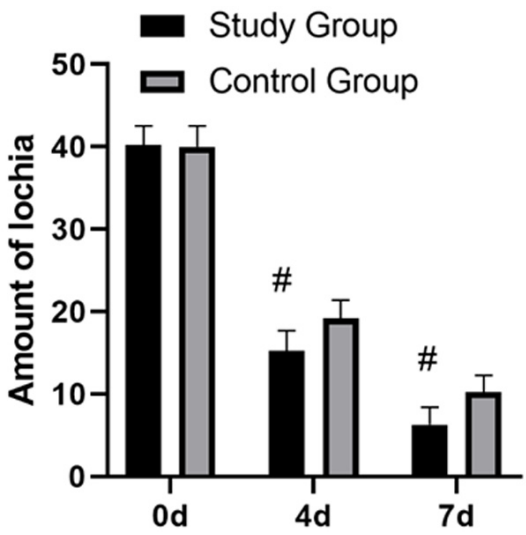

Figure 1. Comparison of volume of lochia between two groups. The difference between the two groups in terms of volume of lochia was not statistically significant (P>0.05) before intervention, and volume of lochia was significantly lower in the study group than in the control group at both day 4 and day 7 of the intervention (P<0.05). #represents statistically significant difference between groups of the same index.

ing to normal distribution were expressed as (mean ± standard deviation) and examined by the t-test. P<0.05 indicated significant difference [12].

Results

Comparison of baseline data between two groups

In terms of baseline data, such as age, gestational week, weight, height, time of pregnancy, delivery and underlying disease, there were no significant differences between two groups (P>0.05), suggesting that two groups were comparable (**Table 1**).

Comparison of the effectiveness of the intervention between two groups

The total effective rate of treatment in the study group was 100.00%, higher than 93.33% in the control group (P<0.05) (**Table 2**).

Comparison of volume of lochia between two groups

The volume of lochia did not differ significantly between two groups before intervention (P> 0.05), and was lower in the study group than that in the control group at day 4 and day 7 of intervention (P<0.05) (**Figure 1**).

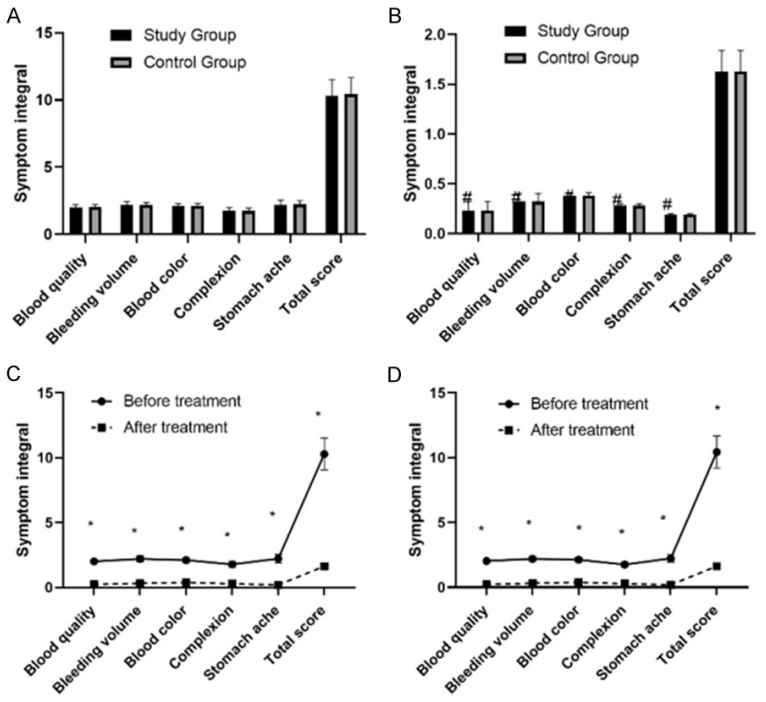

Figure 2. Comparison of maternal TCMSS before and after intervention between two groups. The difference between two groups in terms of TCMSS before intervention was not significant (P>0.05) (A). After intervention, the scores were lower in the study group than in the control group (P<0.05) (B). TCMSS before and after intervention differed significantly between study group (C) and control group (D) (P<0.05).

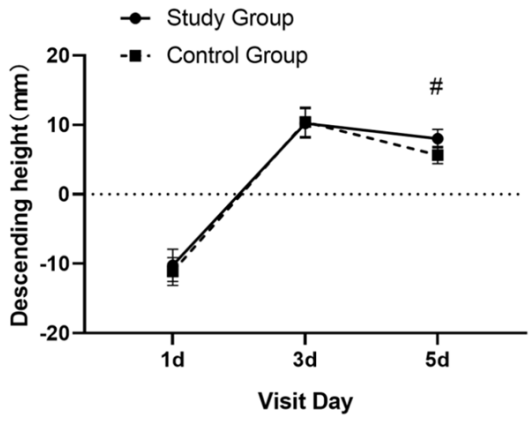

Figure 3. Comparison of decreased height of uterine fundus between two groups. There was no significant difference in the decreased height of uterine fundus between the study group and the control group at day 1 and day 3 after treatment (P>0.05). At day 5 after treatment, the decreased height of uterine fundus in the study group was significantly higher than that in the control group, and the difference between groups was statistically significant (P<0.05). #represents statistically significant difference between groups of the same index.

Comparison of TCMSSs before and after the intervention between two groups

The scores of each item of TCMSS between two groups did not differ significantly before treatment (P>0.05). After treatment, the scores of the above dimensions in both groups showed a significant decrease (P<0.05). Meanwhile, TCMSSs in the study group were lower than those in control group (P< 0.05) (**Figure 2**).

Comparison of the decreased height of the uterine fundus between two groups

The comparison between the groups at day 1 and day 3 after treatment showed that there was no significant difference in the decreased height of uterine fundus between the study group and the control group (P>0.05). At day 5 after treatment, the decreased height of uterine fundus in the study group was significantly higher than that in the control group, and the difference between groups was statistically significant (P<0.05) (**Figure 3**).

Comparison of hemorheological indices before and after the intervention between two groups

The comparison showed that there was no significant difference in plasma viscosity and erythrocyte sedimentation rate between the two groups before drug administration (P> 0.05). After intervention, the plasma viscosity and erythrocyte sedimentation rate were significantly reduced in both groups compared with those before intervention (P<0.05). Meanwhile, the plasma viscosity of the study group was significantly lower than that of the control group (P<0.05) (**Figure 4**).

Comparison of incidence of adverse reactions between two groups

The incidence of adverse reactions was 8.33% (5/60) in the study group and 11.67% (7/60) in

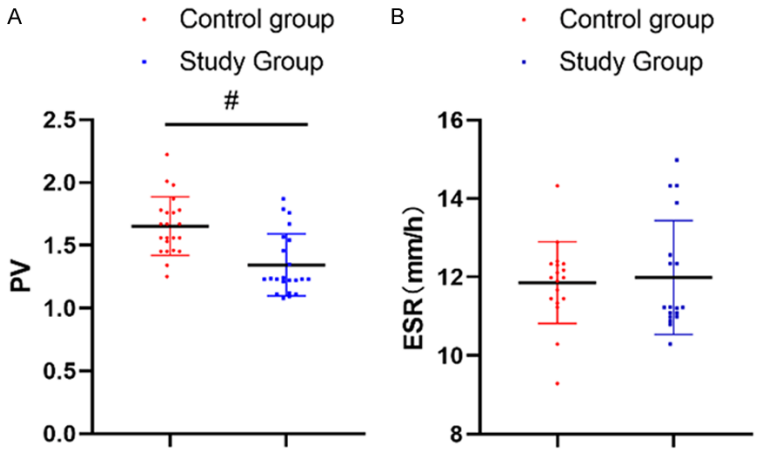

Figure 4. Comparison of hemorheological indices before and after the intervention between two groups. After treatment, the plasma viscosity of the study group (A) was significantly lower than that of the control group ($P<0.05$), while there was no statistically significant difference between the groups in erythrocyte sedimentation rate (B) ($P>0.05$). #represents statistically significant difference between groups of the same index.

the control group, exhibiting significant difference ($P>0.05$) (**Table 3**).

Discussion

In modern western medicine, lochia is defined as massive uterine hemorrhage during the puerperium within 24 hours after delivery, namely postpartum hemorrhage or puerperal hemorrhage. This symptom usually occurs in 1-2 weeks after delivery. Patients often experience small or moderate amount of continuous or intermittent bleeding from the vagina, and some parturients may bleed massively while being accompanied by occasional blood clots [13, 14]. At present, the treatment options for lochia home or abroad in Western medicine are relatively simple. Ultrasonography and laboratory examinations are performed for most patients, and uterine curettage is performed directly for women undergoing natural labor after diagnosis. For women with cesarean section, the uterine curettage is performed under ultrasound positioning, and patients are given drugs to prevent infection and promote uterine contractions after surgery to accelerate uterine contractions and involution. However, clinical practice has found that surgery can cause secondary injury to the endometrium, and administration of a single drug often resulted in poor efficacy, which can adversely affect the improvement of maternal symptoms and their postpartum recovery [15, 16].

The lochia was firstly described in Jin Gui Yao Lue by Zhang Zhongjing in Han Dynasty, where it is described as “At seven or eight days after childbirth, there is no evidence of TAI YANG syndrome, however, the patients feel pain in outer part of the lower abdomen”. TCM believed that the lochia is caused by syndrome of disharmony of Chong and Conception channels the abnormal circulation of qi and blood, leading to blood stasis in the uterus [17]. In “Medical Insights: Persistent lochia”, lochia was believed to be caused by stasis of blood, with the stagnant blood not going away and the new blood not being produced. Therefore, lochia should be treated by promoting blood circulation and eliminating stasis [18]. In this study, we evaluated the clinical effect of FFYMC capsules combined with YX decoction by comparison with the control group. Results showed that the effective rate of the study group was as high as 100.00%, which was significantly higher than 93.33% in the control group. A clinical study conducted on 100 parturients with lochia found that FFYMC capsules could accelerate postpartum hemostasis and reduce postpartum bleeding [19]. The authors believed that lochia is mostly related to stagnation of vital energy and phlegm stasis caused by Yin deficiency and blood heat or derangement of Qi and blood. According to TCM, Qi and blood are severely depleted during delivery, and their sudden deficiency will lead to “deficiency” symptoms such as fear of cold, and sweating by slight heat after delivery. While the uterine contraction after delivery will cause “stasis” symptoms such as residual blood and turbid fluid, thus the patients often experience “multiple deficiencies and stasis”, leading to abnormal Qi and Blood [20]. Yimucao capsules contain Motherwort, Angelicae Sinensis Radix, Szechwan Lovage Rhizome, Vladimirae Radix and other ingredients. Among them, Motherwort can cool blood and promote blood circulation, remove blood stasis and regulate menstruation. Angelicae Sinensis Radix can

Table 3. Comparison of the incidence of adverse reactions between two groups [n (%)]

Group	Number of cases	Nausea and vomiting	Skin itch	Abnormal renal and liver function	Total incidence
Study group	60	2 (3.33)	2 (3.33)	1 (1.67)	5 (8.33)
Control group	60	2 (3.33)	4 (6.67)	1 (1.67)	7 (11.67)
X^2	-	-	-	-	0.370
P	-	-	-	-	0.543

promote Qi and relieve pain, and Szechwan Lovage Rhizome can promote Qi and blood circulation, expel wind and relieve pain. The combination of these drugs can significantly alleviate lochia and accelerate their postpartum recovery [21, 22], thus, the volume of lochia in the study group was significantly less than that in the control group after the intervention.

In this study, the effect of the combined drugs on the TCMSS was also determined. Compared to the control group, the parturients in the combined group scored significantly lower in all five dimensions of blood quality, vaginal bleeding, blood color, complexion, and abdominal pain, suggesting that all of these symptoms were significantly improved in the study group following the treatment. It has been confirmed that the motherwort in Yimucao capsule could enhance uterine contraction, which accelerates the elimination of residual tissues, and also play a hemostatic effect by promoting uterine contraction [23], Angelicae Sinensis Radix could promote the recovery of hematopoietic function and improve immune function [24], and Szechwan Lovage Rhizome has anti-inflammatory effect and could reduce postpartum infection [25], evidenced by the result that the incidence of maternal complications in the study group was lower than that in the control group, confirming that the combination of two drugs has a better clinical treatment effect on lochia with a high safety.

In conclusion, the combination of FFYMC capsule and YX decoction could improve the clinical treatment effect, and also reduce volume of lochia and improve clinical symptoms of parturients with high safety. In this study, the efficacy of combined application of Chinese medicines in the intervention of postpartum inexhaustible lochia was analyzed through a controlled study with grouping, and the detailed data provide a new way of thinking and direction for clinical intervention of such patients, which is innovative to some extent. However, this study also has certain deficiency. All patients were from hospital, leading to single source and small sample size. Additionally, there is no long-term follow-up for patients, leading to low reference value of the study results, which is therefore planned to be revised and improved in the next step.

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Disclosure of conflict of interest

None.

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References

[1] Andrikopoulou M and D'Alton ME. Postpartum hemorrhage: early identification challenges. Semin Perinatol 2019; 43: 11-17.

[2] Evensen A, Anderson JM and Fontaine P. Postpartum hemorrhage: prevention and treatment. Am Fam Physician 2017; 95: 442-449.

[3] Newsome J, Martin JG, Bercu Z, Shah J, Shekhani H and Peters G. Postpartum hemorrhage. Tech Vasc Interv Radiol 2017; 20: 266-273.

[4] Higgins N, Patel SK and Toledo P. Postpartum hemorrhage revisited: new challenges and solutions. Curr Opin Anaesthesiol 2019; 32: 278-284.

[5] Ring L and Landau R. Postpartum hemorrhage: anesthesia management. Semin Perinatol 2019; 43: 35-43.

[6] Dahlke JD, Bhalwal A and Chauhan SP. Obstetric emergencies: shoulder dystocia and postpartum hemorrhage. Obstet Gynecol Clin North Am 2017; 44: 231-243.

[7] Phillips JM, van den Anker JN and Ahmadzia HK. Next generation medical management of postpartum hemorrhage. Curr Pharm Des 2019; 25: 549-555.

[8] Jackson DL and DeLoughery TG. Postpartum hemorrhage: management of massive transfusion. Obstet Gynecol Surv 2018; 73: 418-422.

[9] Borovac-Pinheiro A, Pacagnella RC, Cecatti JG, Miller S, El Ayadi AM, Souza JP, Durocher J, Blumenthal PD and Winikoff B. Postpartum hemorrhage: new insights for definition and diagnosis. Am J Obstet Gynecol 2018; 219: 162-168.
[10] Pacheco LD, Saade GR and Hankins GDV. Medical management of postpartum hemorrhage: an update. Semin Perinatol 2019; 43: 22-26.
[11] Watkins EJ and Stem K. Postpartum hemorrhage. JAAPA 2020; 33: 29-33.
[12] Ononge S, Mirembe F, Wandabwa J and Campbell OM. Incidence and risk factors for postpartum hemorrhage in Uganda. Reprod Health 2016; 13: 38.
[13] Aoki M, Tokue H, Miyazaki M, Shibuya K, Hirasawa S and Oshima K. Primary postpartum hemorrhage: outcome of uterine artery embolization. Br J Radiol 2018; 91: 20180132.
[14] Feduniw S, Warzecha D, Szymusik I and Wielgos M. Epidemiology, prevention and management of early postpartum hemorrhage-a systematic review. Ginekol Pol 2020; 91: 38-44.
[15] Suarez S, Conde-Agudelo A, Borovac-Pinheiro A, Suarez-Rebling D, Eckardt M, Theron G and Burke TF. Uterine balloon tamponade for the treatment of postpartum hemorrhage: a systematic review and meta-analysis. Am J Obstet Gynecol 2020; 222: 293.e291-293.e252.
[16] Sentilhes L, Merlot B, Madar H, Sztark F, Brun S and Deneux-Tharaux C. Postpartum haemorrhage: prevention and treatment. Expert Rev Hematol 2016; 9: 1043-1061.
[17] Saccone G, Caissutti C, Ciardulli A and Berghella V. Uterine massage for preventing postpartum hemorrhage at cesarean delivery: which evidence? Eur J Obstet Gynecol Reprod Biol 2018; 223: 64-67.
[18] Kawakita T, Mokhtari N, Huang JC and Landy HJ. Evaluation of risk-assessment tools for severe postpartum hemorrhage in women undergoing cesarean delivery. Obstet Gynecol 2019; 134: 1308-1316.
[19] Goffman D, Nathan L and Chazotte C. Obstetric hemorrhage: a global review. Semin Perinatol 2016; 40: 96-98.
[20] Anger H, Durocher J, Dabash R and Winikoff B. How well do postpartum blood loss and common definitions of postpartum hemorrhage correlate with postpartum anemia and fall in hemoglobin? PLoS One 2019; 14: e0221216.
[21] Voon HY, Suharjono HN, Shafie AA and Bujang MA. Carbetocin versus oxytocin for the prevention of postpartum hemorrhage: a meta-analysis of randomized controlled trials in cesarean deliveries. Taiwan J Obstet Gynecol 2018; 57: 332-339.
[22] Ahmadzia HK, Phillips JM, Katler QS and James AH. Tranexamic acid for prevention and treatment of postpartum hemorrhage: an update on management and clinical outcomes. Obstet Gynecol Surv 2018; 73: 587-594.
[23] Durmaz A and Komurcu N. Relationship between maternal characteristics and postpartum hemorrhage: a meta-analysis study. J Nurs Res 2018; 26: 362-372.
[24] Quantitative blood loss in obstetric hemorrhage: ACOG COMMITTEE OPINION, number 794. Obstet Gynecol 2019; 134: e150-e156.
[25] Scheich B. Implementation and outcomes of the AWHONN postpartum hemorrhage project. J Obstet Gynecol Neonatal Nurs 2018; 47: 684-687.