Int J Clin Exp Med 2019;12(5):5638-5645
www.ijcem.com /ISSN:1940-5901/IJCEM0089634

Original Article

Comprehensive nursing for dangerous placenta previa operations in improving the clinical effects of postoperative infections and bleeding volume in the maternal

Zhaoxia Chen[1*], Weizhu Zhang[2*], Liming Chen[3], Yan Li[1], Jing Huang[1], Qi Shi[1]

[1]Department of Obstetrics, Affiliated Hospital of North Sichuan Medical College, Nanchong, China; [2]Department of Pediatric Surgery, Affiliated Hospital of North Sichuan Medical College, Nanchong, China; [3]Department of Gynecology, Affiliated Hospital of North Sichuan Medical College, Nanchong, China. [*]Equal contributors and co-first authors.

Received December 10, 2018; Accepted January 10, 2019; Epub May 15, 2019; Published May 30, 2019

Abstract: Objective: The aim of this study was to observe the clinical effects of comprehensive nursing for the dangerous placenta previa operation on improving postoperative infections and bleeding volume in the maternal. Method: A total of 82 patients, undergoing the dangerous placenta previa operation, were randomly divided into the intervention group and routine group, with 41 cases in each group. The intervention group was given comprehensive nursing intervention during the perioperative period, while the routine group received routine nursing intervention during the perioperative period. General clinical data, pregnancy outcomes, complications, improvement of bad moods (including self-rating anxiety scale (SAS) and self-rating depression scale (SDS) before and after nursing), and nursing satisfaction were compared between the two groups. Results: Surgical effects of the intervention group were significantly higher than those of the routine group (P<0.05). Incidence of postoperative infections in the intervention group was significantly lower than that of the routine group (P<0.05). Incidence of postoperative complications of the intervention group was significantly lower than that of the routine group (P<0.05). Intraoperative bleeding volume of the intervention group was significantly lower than that of the routine group (P<0.05). Quality of life and nursing satisfaction of the intervention group were significantly higher than those of the routine group (P<0.05). Conclusion: Application of comprehensive nursing intervention during the perioperative period for patients with dangerous placenta previa can effectively reduce postoperative infections and intraoperative bleeding, as well as improve operation effects, quality of life, and nursing satisfaction.

Keywords: Dangerous placenta previa, comprehensive nursing, postoperative infection, bleeding volume

Introduction

Dangerous placenta previa is a very dangerous complication for pregnant women, usually during mid and late-pregnancy. Studies have reported that incidence of dangerous placenta previa in cesarean section women was significantly higher than that in vaginal delivery women [1, 2]. Incidence of placenta implantation was closely related to the number of cesarean sections [3]. Caesarean section can aggravate damage of the endometrium and postpartum hemorrhages, one of the main causes of vaginal bleeding in late pregnancy caused by dangerous placenta previa. Incidence of dangerous placenta previa will continue to increase with the number of caesarean sections performed [4]. The conditions of dangerous placenta previa patients are critical. Once improperly handled, it will seriously threaten the life and health of pregnant women. Therefore, clinical attention has been paid to the whole treatment process of patients with dangerous placenta previa. Treatment and corresponding nursing methods of pregnant women with dangerous placenta previa have been continuously optimized [5].

Patients with dangerous placenta previa require higher nursing operations. Reasonable nursing

measures can significantly improve adverse reactions and prevent complications [6]. Different nursing schemes have different effects on patients with dangerous placenta previa. Choosing the appropriate nursing scheme has a great influence on patients with dangerous placenta previa [7, 8]. Comprehensive nursing has positive effects on the life status of patients with dangerous placenta previa, effectively improving the effective intervention methods of patient psychological and emotional states, avoiding the pain of negative emotions [9]. Comprehensive nursing provides a more reasonable reference for clinical dangerous placenta previa.

The current study explored the effects of comprehensive nursing, applied to the operation of dangerous placenta previa, on improving the clinical efficacy of postoperative infections and bleeding volume.

Materials and methods

General data

A total of 82 cases of dangerous placenta previa, admitted from September 2017 to April 2018, were selected as research subjects. According to different nursing conditions, patients were randomly divided into two groups. A total of 41 patients receiving routine nursing were included in the routine group, while 41 patients receiving comprehensive nursing intervention were included in the comprehensive group. Exclusion and inclusion criteria: (1) Patients with dangerous placenta previa in the hospital were included and clinical diagnosis was based on the criteria of dangerous placenta previa symptoms developed by the International Society of Obstetrics and Gynecology [10]; (2) Patients with complications, such as coagulation dysfunction and other blood diseases, were excluded. Patients with unconsciousness, shock, or mental dysfunction were excluded. Before the start of the study, informed consent was obtained from the patients and their families. This study was approved by the Ethics Committee of School of Health Care Management, Shandong University Baotuquan Campus.

Nursing methods

The control group was given routine nursing intervention for dangerous placenta previa. Before implementation of the dangerous placenta previa operation, the relevant medical staff introduced possible complications and the importance of cooperating with late medical care work. They worked to constantly strengthen communication, aiming to improve the compliance of patients and their families. After the dangerous placenta previa operation, to prevent incision infections, the relevant medical staff strictly followed the doctor's instructions, treating the patients with the appropriate drugs. When the patients suffered from bleeding, they immediately informed the relevant physician-in-charge.

The observation group was given comprehensive nursing intervention, based on the control group. Thermal insulation was used in the dangerous placenta previa operation. To prevent complications caused by hypothermia during the operation, the operating table was warmed up half an hour before the operation. Thermal resistance warming blankets were used to keep the patients warm during the operation. The temperature of corresponding infusion was heated to 37°C. After the dangerous placenta previa operation, relevant medical staff regularly inspected the maternal, closely observing changes of various indicators, including blood pressure, heart rate, vaginal bleeding volume, and body temperature. To prevent occurrence of lower limb venous thrombosis, the staff strictly followed the doctor's advice, treating patients with both lower limb barometric pressure treatment and massages. In addition, the patients were encouraged to perform proper ankle rotation, dorsal flexion, extension, and other small movements, as early as possible. Psychological nursing after the dangerous placenta previa operation was performed. Relevant doctors and nurses timely reflected patient psychological states through communication. When the patients had negative psychological problems, such as depression and anxiety, the medical staff provided psychological counseling to patients, guiding the maternal to face the role change correctly. This method may alleviate negative emotions of the maternal and enhance the confidence of recovery after the dangerous placenta previa operation.

Observation indicators and evaluation criteria

Age, gestational age, number of pregnancies, and thyroid function tests, as well as routine blood, liver, and kidney function tests, were

Table 1. General clinical baseline data of the study group and routine group

Factor		General group (n=41)	comprehensive group (n=41)	t/X^2	*P*
Age (year)		23.95±14.05	24.75±14.25	0.256	0.799
Gestational age		33.25±1.25	33.49±2.36	0.575	0.567
At times		2.64±0.24	2.68±0.54	0.433	0.666
Delivery way	Vaginal delivery	0 (0.00)	0 (0.00)	0.000	1.000
	Cesarean delivery	41 (100.00)	41 (100.00)		
Pregnancy-associated-hypertension	Yes	0 (0.00)	0 (0.00)	0.000	1.000
	No	41 (100.00)	41 (100.00)		
Thyroid function test	FT3 (pmmol/L)	4.62±0.70	4.50±0.59	0.839	0.404
	FT4 (pmmol/L)	11.02±2.67	11.20±4.35	0.226	0.822
	TSH (μIU/m L)	1.68±1.29	1.93±0.84	1.040	0.302
	TT3 (nmol/L)	1.97±0.10	1.79±0.59	1.926	0.058
	TT4 (nmol/L)	128.43±23.31	119.02±24.95	1.765	0.081
Blood routine	Hb (gm/dl)	12.23±1.86	12.63±2.63	0.795	0.429
	RBC ($\times 10^{12}$/L)	4.29±0.57	4.39±0.65	0.741	0.461
	PLT ($\times 10^{9}$/L)	148.61±20.55	151.74±25.01	0.619	0.538
liver function	ALT (U/L)	11.39±10.45	12.42±7.18	0.520	0.604
	AST (U/L)	12.35±5.63	13.45±8.23	0.706	0.482
Renal function	BUN (mmol/L)	4.76±3.83	4.35±2.53	0.572	0.569
	CR (umol/L)	60.04±24.01	59.08±28.39	0.165	0.869
	UA (μmol/L)	104.58±34.28	103.12±32.58	0.198	0.844

compared between the comprehensive group and routine group before delivery. Pregnancy outcomes (including hospitalization time, termination time of pregnancy, neonatal Apgar score, and postpartum bleeding volume), complications (including postpartum anemia, neonatal asphyxia, postpartum infection, and postpartum hemorrhage), improvement of bad moods (including self-rating anxiety scale (SAS) [11] and self-rating depression scale (SDS) [12] before and after nursing), and nursing satisfaction were compared between the comprehensive group and routine group. The above observation indicators and assessments were recorded by the patient's attending physician through questionnaires.

Statistical methods

SPSS 19.0 (Beijing Boyi Intelligence Information Technology Co., Ltd.) software system was used for statistical analysis. Count data are expressed as [n (%)]. Count data were tested by x^2 test. Measurement data are expressed by ($x \pm s$). Independent sample t-test was used for comparisons between the two groups. Paired t-test was used before and after nursing. $P< 0.05$ indicates statistical significance.

Results

No differences in baseline data between two groups

A total of 41 patients receiving routine nursing were included in the routine group. The age range was (23-38) years old, with an average age of (23.95±14.05) years old. A total of 41 patients receiving comprehensive nursing intervention were included in the comprehensive group. The age range was (22-39) years old, with an average age of (24.75±14.25) years old. Age, gestational age, number of pregnancies, and thyroid function tests, as well as routine blood, liver, and kidney function tests, were compared between the groups before delivery. Results showed no significant differences between the two groups (P>0.05) (**Table 1**).

Better pregnancy outcomes observed in the comprehensive group

Hospitalization time, pregnancy termination time, neonatal Apgar scores, and postpartum blooding volume in the comprehensive group were (11.48±2.52) weeks, (38.40±1.60) weeks, (9.47±1.00), and (330.27±20.13) mL, respectively. Those in the routine group we-

Table 2. Pregnancy outcomes of the two groups of women

Group	Hospital stay (week)	Termination of pregnancy (week)	Newborn Apgar score	Postpartum hemorrhage (mL)
Comprehensive group (n=41)	11.48±2.52	38.40±1.60	9.47±1.00	330.27±20.13
Regular group (n=41)	17.29±1.34	35.29±0.52	8.10±0.68	414.18±19.02
t	13.030	11.840	7.254	19.400
P	<0.001	<0.001	<0.001	<0.001

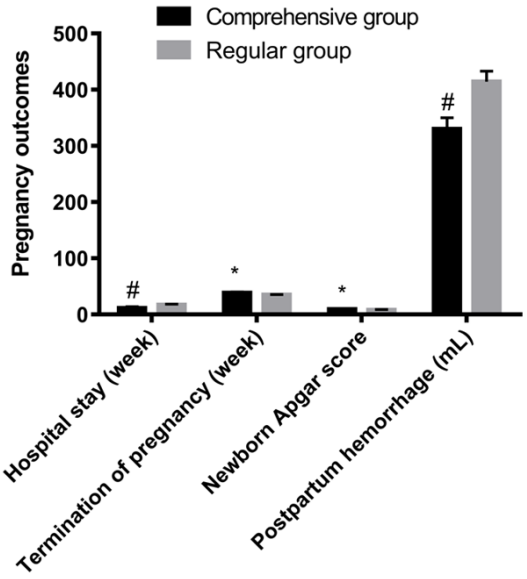

Figure 1. Pregnancy outcomes of pregnant women in routine and comprehensive groups Pregnancy termination times and neonatal Apgar scores in the comprehensive group were significantly higher than those in the routine group (P<0.05), but hospitalization times and postpartum blooding volume in the comprehensive group were significantly lower than those in the routine group (P<0.05). Note: *indicates that the group is significantly higher than the routine group (P<0.05); #indicates that the group is significantly lower than the routine group (P<0.05).

re (17.29±1.34) weeks, (35.29±0.52) weeks, (8.10±0.68), and (414.18±19.02) mL, respectively. Pregnancy termination time and neonatal Apgar scores in the comprehensive group were significantly higher than those in the routine group (P<0.05). However, hospitalization times and postpartum blooding volume in the comprehensive group were significantly lower than those in the routine group (P<0.05) (**Table 2** and **Figure 1**).

Less complications observed in the comprehensive group

There were 4 cases with complications, including postpartum anemia, neonatal asphyxia, postpartum infections, and postpartum hemorrhages, in the comprehensive group. There were 35 cases with complications in the routine group. Comparing the two groups, the total number of complications of postpartum anemia, neonatal asphyxia, postpartum infections, and postpartum hemorrhages in the comprehensive group was significantly lower than in the routine group (P< 0.001) (**Table 3**).

Comprehensive group showed lower SAS scores than the routine group

Results of intra-group comparisons showed that SAS scores of the two groups, after nursing, were significantly lower than those before nursing (P<0.001). Results showed no significant differences in SAS scores between the comprehensive group and routine group before nursing (P>0.05), while SAS scores, after nursing, in the comprehensive group were significantly lower than those, after nursing, in the routine group (P<0.001) (**Figure 2**).

Comprehensive group shows lower SDS scores than the routine group

Results of intra-group comparisons showed that SAS scores of the two groups, after nursing, were significantly lower than those before nursing (P<0.001). Results showed no significant differences in SAS scores between the comprehensive group and routine group before nursing (P>0.05). However, SDS scores, after nursing, in the comprehensive group were significantly lower than those, after nursing, in the routine group (P<0.001) (**Figure 3**).

Comprehensive group shows higher nursing satisfaction than the routine group

Overall nursing satisfaction scores of the routine group were significantly lower than those of the comprehensive group (P<0.05) (**Table 4**).

Discussion

Results of the current study showed no significant differences between the two groups, confirming the comparability of the two groups.

Table 3. Complications of maternal complications in the routine group and comprehensive group

Group	Postpartum anemia	Neonatal asphyxia	Postpartum infection	Postpartum hemorrhage	Total
Comprehensive group (n=41)	1 (2.44)	1 (2.44)	1 (2.44)	1 (2.44)	4 (9.76)
Regular group (n=41)	8 (19.52)	9 (21.95)	10 (24.39)	8 (19.52)	35 (85.37)
X^2	-	-	-	-	46.990
P	-	-	-	-	<0.001

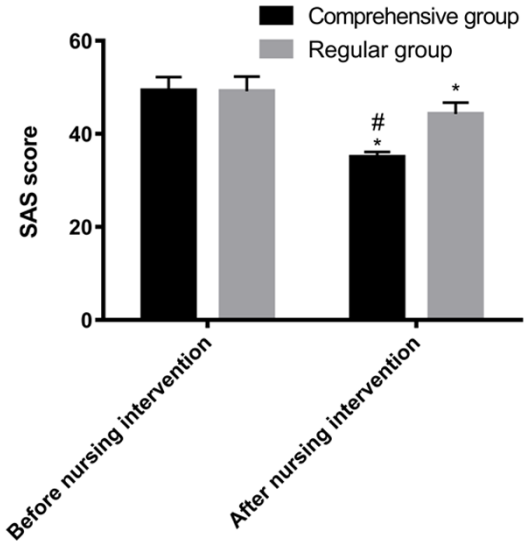

Figure 2. Comparison of SAS scores before and after nursing between the two groups SAS scores of the two groups, after nursing, were significantly lower than those before nursing (P<0.001). SAS scores of the comprehensive group, after nursing, were significantly lower than those of the routine group after nursing (P<0.001). Note: *indicates that the SAS score of this group after nursing is significantly lower than that before nursing (P<0.05); #indicates that the SAS score of this group is significantly lower than that in the routine group (P<0.05).

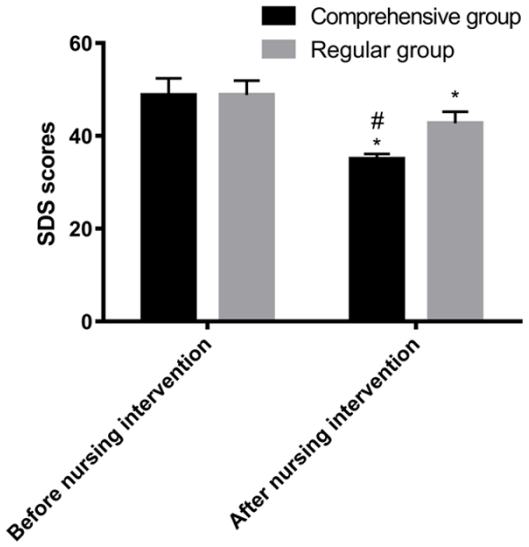

Figure 3. Comparison of SDS scores before and after nursing between the two groups SDS scores of the two groups, after nursing, were significantly lower than those before nursing (P<0.001). SDS scores of the comprehensive group, after nursing, were significantly lower than those of the routine group after nursing (P<0.001). Note: *indicates that the SDS score of this group after nursing is significantly lower than that before nursing (P<0.05); #indicates that the SDS score of this group is significantly lower than that in the routine group (P<0.05).

First, comparing pregnancy outcomes between the routine group and comprehensive group, it was found that pregnancy termination times and neonatal Apgar scores in the comprehensive group were significantly higher than those in the routine group. Also, hospitalization times and postpartum blooding volume in the comprehensive group were significantly lower than those in the routine group. Pregnancy termination time had a greater impact on the maternal and neonatal, while shortening of pregnancy times was not conducive to the growth and development of the fetus [13, 14]. It is very important to examine the physiological indicators and quality of life scores of the neonatal. The neonatal Apgar score has been adopted by most hospitals [15]. Relevant clinical studies have confirmed that better maternal recovery conditions lead to shorter hospitalization times [16]. Control of postpartum blooding volume has also been related to maternal life safety [17]. It is inferred that comprehensive nursing intervention has great effects on improving pregnancy outcomes of patients with dangerous placenta previa. Comparing incidence of complications between the routine group and comprehensive group, it was found that the total number of complications of postpartum anemia, neonatal asphyxia, postpartum infections, and postpartum hemorrhages in the comprehensive group was significantly lower than in the routine group. Postpartum anemia, neonatal asphyxia, postpartum infections, and postpartum hemorrhages are common complications in patients with dangerous placenta pre-

Table 4. Comparison of nursing satisfaction between the two groups [n (%)]

Group	Very satisfied	Satisfied	Not satisfied	Total satisfaction
Observation group (n=41)	32 (78.05)	9 (21.95)	0 (0.00)	41 (100.00)
Control group (n=41)	17 (41.46)	18 (43.90)	6 (14.63)	35 (85.37)
X^2	-	-	-	6.474
P	-	-	-	0.011

via [18-21]. Results suggest that comprehensive nursing intervention plays an important role in preventing or reducing complications of patients with dangerous placenta previa.

In some similar studies, it was found that comprehensive nursing intervention had better effects on improving adverse reactions and complications than the routine nursing mode [22]. Additionally, in the current study, SAS and SDS scoring scales were used to compare adverse emotions of the pregnant women in the routine group and comprehensive group, respectively. Results showed no significant differences in SAS and SDS scores between the comprehensive group and routine group before nursing. However, SAS and SDS scores, after nursing, in the two groups were significantly lower than those before nursing. Scores of SAS and SDS in the comprehensive group, after nursing, were significantly lower than those in the routine group after nursing. Maternal emotional management is very important. If negative emotions of maternal psychology are not alleviated in the right way, anxiety and depression may confuse the maternal. These may lead to the situation in which the maternal does not cooperate with corresponding nursing or treatment. Serious cases not only threaten the mental health of patients, but also involve physical health [23].

According to many reports, in routine nursing intervention, more attention should be paid to psychological changes of the maternal. Emotional problems of the maternal should be considered comprehensively [24]. Present results suggest that comprehensive nursing intervention is better than routine nursing intervention in improving the adverse emotions of patients with dangerous placenta previa. Finally, nursing satisfaction of the maternal in the routine group and comprehensive group was examined. Results showed that overall nursing satisfaction with comprehensive nursing intervention was significantly higher than that with routine nursing. According to the above statistical results, comprehensive nursing intervention was more effective than routine nursing intervention in improving bad moods, preventing complications, and improving pregnancy outcomes. Patients were more satisfied with comprehensive nursing intervention, thus it is worthy of clinical promotion.

In this study, however, there were some limitations. For example, there was no record of the improvement of the quality of life of the subjects. There was no regular follow-up survey of the subjects in the later period and there was a lack of long-term feedback. Moreover, different nursing schemes formulated in different medical environments will also affect the data. Therefore, to solve these problems, further studies will increase the number of statistical hospitals in the later period and formulate a reasonable follow-up time.

In conclusion, comprehensive nursing intervention is more effective than routine nursing intervention in improving bad moods, preventing complications, and improving pregnancy outcomes. Patients were more satisfied with comprehensive nursing intervention, thus it is worthy of clinical promotion.

Disclosure of conflict of interest

None.

Address correspondence to: Qi Shi, School of Health Care Management, Shandong University Baotuquan Campus, No.44, Wenhuaxi Road, Jinan 250012, Shandong, China. Tel: +86 15983789947; E-mail: qishi976@163.com

References

[1] Shi XM, Wang Y, Zhang Y, Wei Y, Chen L and Zhao YY. Reply to "placenta previa accreta and previous cesarean section: some carificati-ons". Chin Med J (Engl) 2018; 131: 1505.

[2] Carrasco-Lopez C, Julian Ibanez JF, Vila J, Luna Tomas MA, Navines Lopez J, Pascual Miguel I, Fernandez-Llamazares-Rodriguez J and Higue-

ras-Sune C. Anterior intercostal artery perforator flap in immediate breast reconstruction: anatomical study and clinical application. Microsurgery 2017; 37: 603-610.
[3] Sentilhes L, Vayssiere C, Deneux-Tharaux C, Aya AG, Bayoumeu F, Bonnet MP, Djoudi R, Dolley P, Dreyfus M, Ducroux-Schouwey C, Dupont C, Francois A, Gallot D, Haumonte JB, Huissoud C, Kayem G, Keita H, Langer B, Mignon A, Morel O, Parant O, Pelage JP, Phan E, Rossignol M, Tessier V, Mercier FJ and Goffinet F. Postpartum hemorrhage: guidelines for clinical practice from the French college of gynaecologists and obstetricians (CNGOF): in collaboration with the French society of anesthesiology and Intensive Care (SFAR). Eur J Obstet Gynecol Reprod Biol 2016; 198: 12-21.
[4] Zhu B, Yang K and Cai L. Discussion on the timing of balloon occlusion of the abdominal aorta during a caesarean section in patients with pernicious placenta previa complicated with placenta accreta. Biomed Res Int 2017; 2017: 8604849.
[5] Maher MA and Abdelaziz A. Comparison between two management protocols for postpartum hemorrhage during cesarean section in placenta previa: balloon protocol versus non-balloon protocol. J Obstet Gynaecol Res 2017; 43: 447-455.
[6] Vitagliano A, Bertin M, Conte L, Borgato S, Leggieri C and Fagherazzi S. Thermal balloon ablation versus transcervical endometrial resection: evaluation of postoperative pelvic pain in women treated for dysfunctional uterine bleeding. Clin Exp Obstet Gynecol 2014; 41: 405-408.
[7] Qi XR, Liu XH, You Y, Wang XD, Zhou R, Xing AY, Zhang L, Ning G, Zhao FM and Li KM. [The application of internal Iliac artery balloon occlusion in pernicious placenta previa]. Sichuan Da Xue Xue Bao Yi Xue Ban 2016; 47: 618-623.
[8] Soyama H, Miyamoto M, Sasa H, Ishibashi H, Yoshida M, Nakatsuka M, Takano M and Furuya K. Effect of routine rapid insertion of Bakri balloon tamponade on reducing hemorrhage from placenta previa during and after cesarean section. Arch Gynecol Obstet 2017; 296: 469-474.
[9] Chong W, Che XY, Wan W and Wu J. [Application of fast-track surgery concept in the perioperative nursing care of andrological patients: a randomized controlled study]. Zhonghua Nan Ke Xue 2016; 22: 1001-1004.
[10] Anderson-Bagga FM, Sze A. Placenta previa. StatPearls [Internet]. Treasure Island (FL): StatPearls Publishing 2019; 4.
[11] Zhao Y, Kane I, Mao L, Shi S, Wang J, Lin Q and Luo J. The prevalence of antenatal depression and its related factors in Chinese pregnant women who present with obstetrical complications. Arch Psychiatr Nurs 2016; 30: 316-321.
[12] Zhu X, Hu S, Zhu L, Ding J, Zhou Y and Li G. Effects of lycium barbarum polysaccharides on oxidative stress in hyperlipidemic mice following chronic composite psychological stress intervention. Mol Med Rep 2015; 11: 3445-3450.
[13] Mequinion M, Caron E, Zgheib S, Stievenard A, Zizzari P, Tolle V, Cortet B, Lucas S, Prevot V, Chauveau C and Viltart O. Physical activity: benefit or weakness in metabolic adaptations in a mouse model of chronic food restriction? Am J Physiol Endocrinol Metab 2015; 308: E241-255.
[14] Enakpene CA, DiGiovanni L, Jones TN, Marshalla M, Mastrogiannis D and Della Torre M. Cervical cerclage for singleton pregnant patients on vaginal progesterone with progressive cervical shortening. Am J Obstet Gynecol 2018; 219: 397, e1-397.e10.
[15] Kahane AF, Park AL and Ray JG. Newborn apgar score and prediction of maternal death. Epidemiology 2018; 29: e27-e29.
[16] Dvorak MF, Noonan VK, Fallah N, Fisher CG, Finkelstein J, Kwon BK, Rivers CS, Ahn H, Paquet J, Tsai EC, Townson A, Attabib N, Bailey CS, Christie SD, Drew B, Fourney DR, Fox R, Hurlbert RJ, Johnson MG, Linassi AG, Parent S, Fehlings MG and Network R. The influence of time from injury to surgery on motor recovery and length of hospital stay in acute traumatic spinal cord injury: an observational Canadian cohort study. J Neurotrauma 2015; 32: 645-654.
[17] Mosley AJ, Roberts ER, Partington H, Gaertner K, Fisher P, Rutten A, Mathie RT, Cartwright SJ, Fixsen A, Kokornaczyk MO, Sokol AM and Tournier AL. HRI Malta 2017-cutting edge research in homeopathy: HRI's third international research conference in Malta. Homeopathy 2018; 107: 50-54.
[18] Zhou H, Wu J, Ling W, Zhu D, Lu L, Wang X, Pu L and Kong L. Application of microwave ablation in the emergent control of intraoperative life-threatening tumor hemorrhage during hepatic surgeries. Int J Hyperthermia 2018; 34: 1049-1052.
[19] Saad AF, Kirsch N, Saade GR and Hankins GDV. Progressive devascularization: a novel surgical approach for placenta previa. AJP Rep 2018; 8: e223-e226.
[20] Shaikh FH and Bilquees S. Placentophagia: revolution in postpartum medicine, or just a trend? J Obstet Gynaecol Can 2018; 40: 286.
[21] Melekoglu R, Eraslan S, Celik E and Simsek Y. Perinatal and neonatal outcomes of patients

who were diagnosed with neural tube defect in midtrimester fetal ultrasound scan and refused request for termination of pregnancy. Biomed Res Int 2016; 2016: 6382825.

[22] Reddy UM, Rice MM, Grobman WA, Bailit JL, Wapner RJ, Varner MW, Thorp JM Jr, Leveno KJ, Caritis SN, Prasad M, Tita AT, Saade GR, Sorokin Y, Rouse DJ, Blackwell SC, Tolosa JE; Eunice Kennedy Shriver National Institute of Child Health and Human Development Maternal-Fetal Medicine Units Network; Eunice Kennedy Shriver National Institute of Child Health and Human Development Maternal-Fetal Medicine Units Network. Serious maternal complications after early preterm delivery (24-33 weeks' gestation). Am J Obstet Gynecol 2015; 213: 538, e1-9.

[23] Endendijk JJ, De Bruijn ATCE, Van Bakel HJA, Wijnen HAA, Pop VJM and Van Baar AL. Maternal interaction quality moderates effects of prenatal maternal emotional symptoms on Girls' internalizing problems. Infant Ment Health J 2017; 38: 634-644.

[24] Tao H, Shao T, Ni L, Sun Y, Yan S, Gu C, Cao H, Huang K, Tao F and Tong S. [The relationship between maternal emotional symptoms during pregnancy and emotional and behavioral problems in preschool children: a birth cohort study]. Zhonghua Yu Fang Yi Xue Za Zhi 2016; 50: 129-135.