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# EFFECT OF INTRAMYOMETRIAL INJECTION OF VASOPRESSIN IN REDUCING BLOOD LOSS DURING CAESAREAN SECTION IN PLACENTA PRAEVIA: A COMPARATIVE STUDY

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**ABSTRACT** **INTRODUCTION:** In a patient complicated by placenta praevia, profuse haemorrhage may occur following separation of placenta during caesarean section. Sometimes, hysterectomy with massive blood transfusion may be required to save the mother. The reduction of blood loss may be achieved following vasopressin injection into the placental implantation site.

**MATERIALS AND METHODS:** In our study with sample size 60, 20 units of vasopressin diluted in 100 ml of normal saline were injected in the placental site in 30 patients with placenta praevia during caesarean section. The outcome was measured and compared with control group.

**RESULTS:** Bleeding was successfully arrested with a mean volume of blood loss being 1114.6 ml in the study group whereas in the control group, mean volume of blood loss being 1367.33ml (p=0.0016). None of them exhibited any adverse effect and did not require haemostatic surgical sutures or hysterectomy.

**CONCLUSION:** The intramyometrial diluted vasopressin in the placental bed following placental separation during cesarean section in cases of placenta previa effectively reduced and arrested blood loss without any adverse effects

**KEYWORDS :** Vasopressin, Placenta Praevia, Haemorrhage

## INTRODUCTION:

Obstetric haemorrhage is the most common cause of maternal morbidity and mortality worldwide. Abnormal placentation is one of the important causes of haemorrhage and mortality [1]. Placenta praevia accounts for one third causes of APH, can cause both antepartum and intrapartum haemorrhage [6]. The incidence of placenta praevia is average 0.3 percent or 1 case per 300 to 400 deliveries[2]. The risk of placenta praevia increases with increased maternal age , increased parity, previous uterine scar , multiple pregnancy , previous abortion, cigarette smoking[7] etc. Suturing of the placental bed may be required, if there are bleeding sinuses in the placental bed. Simultaneously oxytocics are administered if bleeding still persists, haemostatic sutures, uterovaginal packing, balloon tamponade and systemic devascularization of the uterus might be carried out. If bleeding continues or recurs hysterectomy is usually required[4]. Caesarean delivery is necessary in practically all cases of placenta praevia. The volume of haemorrhage during surgery in cases of placenta praevia is significantly higher than in cases of normal presentation, and the rate of blood transfusion is also significantly increased. However, during caesarean section in patients with placenta praevia , haemorrhage from the placental implantation site may continue after placenta delivery[6]. Vasopressin, a nonapeptide secreted by posterior pituitary and synthesized in supraoptic and paraventricular nuclei of hypothalamus, [5]has already established role in various gynaecological operation such as myomectomy, vaginal hysterectomy, abdominal hysterectomy, ovarian cystectomy, and hysteroscopy subendometrial injection of vasopressin was reported for management of placenta praevia and in second trimester dilatation and curettage to reduce bleeding[3]. My study aims to show that local vasopressin infiltration in myometrium has a role in reducing blood loss from placental site in placenta previa during cesarean section. Vasopressin stops PPH by myometrial contraction by action on oxytocin type receptors, causing intense vasospasm at the site of injection, resulting in reduced absorption and systemic dissemination[3].

Our aim is to introduce or inject vasopressin in different sites of myometrium to prevent intraoperative and postoperative haemorrhage in placenta previa during cesarean section.

Aims and objective of my study is to evaluate blood loss during caesarean section in placenta praevia after expulsion of placenta by intramyometrial injection of vasopressin at different sites and thus to reduce the postoperative complications, maternal morbidity and mortality.

## MATERIALS AND METHODS:

The randomized controlled trial was conducted in the Department Of Obstetrics and Gynaecology, Medical college and hospital, Kolkata among antenatal patients diagnosed as placenta praevia confirmed by ultrasonography undergoing caesarean section from March 2016 to Feb 2017 (1 year). Sample size was 60 which was divided into two groups, group V(30) with vasopressin given and Group P(30) without vasopressin (Sample size calculated according to sample size calculator (for quantitative data) and selected using purposive sampling technique). Antenatal patients diagnosed as placenta praevia getting admitted in labour room were included in our study. Antenatal patients with placenta praevia with preexisting heart disease and coagulopathy, mothers with any other obstetric complications like pre eclampsia, eclampsia, oligohydramnios, polyhydramnios, macrosomia, known risk factors of post-partum haemorrhage, pregnancy with uterine fibroids, previous classical uterine incision[6], placenta percreta and accreta diagnosed antenataly[6], known drug allergy to oxytocin or vasopressin and multiple pregnancy were excluded from our study. Cesarean sections were performed under general or spinal anesthesia as opined by anaesthetists and depending on the haemodynamic stability. During caesarean section standard monitoring included electrocardiogram, blood pressure, maternal heart rate and pulse oximetry. Intraoperative fluid management was done by anaesthetists. Two groups were compared, Group V (n=30) and Group P (n=30). All the patients in both groups received 5 units of I.M. oxytocin and 10 units of I.V. oxytocin in 500 ml of 0.9% normal saline, 800 microgram of misoprostol per rectal. Following delivery of placenta during caesarean section, 20 units vasopressin diluted in 100ml normal saline will be infiltrated intra myometrially at multiple sites under direct vision at caesarean section in Group V. During infiltration uterus will be lifted up and stabilized bimanually to avoid injury to adjacent bowel. During injection the piston will be pulled to ensure no blood is coming in syringe, and there is intramyometrial injection. Blood loss was measured as: after incision of uterine muscle and rupture of membranes amniotic fluid was as much collected in separate suction bottle and blood was collected in another bottle and additional weights of soaked mops. Blood loss compared by collection of volume of blood in sucker jar[6], weight of mops before and after OT (the mops were not squeezed during opt), pre and postoperative haemoglobin levels, intraoperative blood pressure and pulse rate[6]. Hypotension was defined as a decrease in the mean BP by more than 10% of the baseline value[6]. Tachycardia was defined as maternal heart rate >120 b.p.m.[6]

The blood loss was calculated by measuring the weight of mops used during caesarean section before and after soakage without squeezing the mops during OT and then by subtracting the values, measuring the blood collected in suction apparatus making sure the apparatus was emptied before OT, we got the blood loss in that operation and the blood loss was compared with and without use of vasopressin. Collected data were analyzed for sensitivity, specificity, positive

predictive value, negative predictive value, p value with statistical software GraphPad insta.

***RESULTS AND ANALYSIS:***

Initially 100 patients were assessed for eligibility, 36 patients did not meet the inclusion criteria, 4 patients opted out from the study. Finally, 60 patients were taken up for randomization into two groups of 30 each to receive intramyometrial vasopressin (20 unit diluted in 100 ml NS) at different sites , in the placental bed after delivery of placenta in cases of included placenta praevia. There were no refusals after randomization. So, data from 60 patients were available for analysis; group V (n=30), group P (n=30). Observations were tabulated in excel sheet and analysed. Continuous data was expressed as mean ± SD Statistical test were considered significant when p value<0.05.All analyses were conducted using statistical software Instat.exe 2003.

**Table 1 Distribution of pregnant mothers with placenta praevia according to demographical parameters, Hb%, BT,CT**

| Parameters (Mean ±SEM) | Group V(n=30) | Group P(n=30) | p-Value |
|---|---|---|---|
| Age in years | 24.7±0.41 | 24.93±0.40 | 0.693(NS) |
| Parity | 1.00±0.19 | 1.03±0.20 | 0.904(NS) |
| BMI | 23.43±0.25 | 23.23±0.25 | 0.577(NS) |
| Hb% at term | 10.51±0.06 | 10.60±0.06 | 0.322(NS) |
| Bleeding time in seconds | 88.96±2.88 | 96.76±2.95 | 0.064(NS) |
| Clotting time in seconds | 198.23±5.69 | 208.4±5.15 | 0.191(NS) |

Table 1 shows the mean age, parity BMI for group V receiving and that of group P not receiving vasopressin are statistically not significant. The mean haemoglobin level for group V was 10.51 with SEM of 0.063 and that for group P was 10.60 with SEM of 0.064 and p value of 0.322 which is statistically also not significant. The mean Bleeding time of Group V was 96.76 with SEM of 2.88 and that of Group P was 96.76 with SEM of 2.95 and a p value of 0.064 not statistically significant. The mean CT of Group V was 198.23 with SEM of 5.69 and that of Group P was 208.4 with SEM of 5.15, the p value being 1.91 which is statistically not significant.

**Table 2: Distribution of probable causes of placenta previa**

| Probable causes | Group V(n=30) | Group P(n=30) |
|---|---|---|
| H/O Previous one induced abortion | 3(10%) | 4(13.3%) |
| H/O Previous two or more induced abortion | 2(6.6%) | 2(6.6%) |
| H/O Previous one LSCS | 10(33%) | 11(36%) |
| H/O Previous two LSCS | 3(10%) | 2(6.6%) |
| H/O previous other uterine surgery | 1(3%) | 0 |

The percentage of placenta praevia mothers in Group V and Group P with one and two induced abortions, one or two prior caesarean sections are statistically not significant. The percentage of pregnant mothers with previous uterine surgery between the two groups is also comparable.

**Table 3: Blood loss during delivery and outcome parameters bet ween study and control groups**

| Parameters (Mean ±SEM) | Group V(n=30) | Group P(n=30) | p-Value |
|---|---|---|---|
| Volume of blood loss in ml | 1114.66±16.75 | 1367.33±9.12 | 0.0016(S) |
| No. of mothers required bilateral uterine artery ligation | 1 | 6 | 0.1028(NS) RR 0.2611(Fisher exact test |
| No. of mothers required other hemostatic sutures | 1 | 4 | 0.353(NS) RR 0.3793(Fisher exact test |
| No. of mothers required obstetrical hysterectomy | 0 | 1 | - |

Table 3 showed that the mean volume of blood loss in Group V is 1114.66 ml with SEM being 16.752 and the mean volume of blood loss in Group P is 1367.33 ml with SEM being 9.122 and p value of 0.0016 which is significant. None of the patients in either group exhibited any elevation of BP>140/90 or decrease in pulse rate by 15 bpm and none of the patients in either group had any oliguria during OT and post operative period. No patients were shifted to ICU and none required hysterectomy. 10% of placenta previa mothers who did not receive intramyometrial diluted vasopressin required some other haemostatic sutures like haemostatic suture in the placental bed, B Lynch sutures etc. Whereas all the placenta previa mothers receiving intramyometrial diluted vasopressin did not require other haemostatic sutures as diluted vasopressin effectively arrested bleeding.

**DISCUSSION:**

In our study, injection of diluted vasopressin in the placental site significantly reduced blood loss without any adverse effects. The reduction of blood loss following vasopressin injection into the placental implantation site may be caused not only by peripheral action but also by contraction of uterine smooth muscle.[3] Here in this study 20 units of vasopressin diluted in 100 ml of normal saline, more concentrated form has been used than that recommended previously[8], which advised 20 units in 200 ml normal saline during myomectomy. Lurie et al reported six patients with uncontrollable haemorrhage caused by obstetrical complications at the time of caesarean section in which they successfully controlled the bleeding and salvaged the uterus using vasopressin injected sub endometrial in a concentration of 4 units in 20 ml normal saline.[10] Here, in my study with sample size 60, 30 patients with placenta previa received 20 units of intramyometrial vasopressin diluted in 100 ml of NS, in all the cases bleeding was successfully arrested with a mean volume of blood loss being 1114.6 ml, in the control group mean volume of blood loss being 1367.33ml. None of them exhibited any adverse effect and did not require haemostatic surgical sutures, with p value being statistically significant. Zaki and Bahar reported a case of placenta praevia accreta in which they used vasopressin to arrest haemorrhage from the placental bed at a concentration of 5 units in 20ml normal saline.[9] Frishman suggested a routine intramyometrial dose of 2U, upto a maximum of 6U to avoid haemodynamic complications[7]. The difference was significant and the p value was 0.0016, which is significant. The result of this study indicated that that local intramyometrial vasopressin in the placental site might be an acceptable procedure used in addition to other pharmacological treatment during cesarean section in cases of placenta praevia.

**CONCLUSION:**

The intramyometrial diluted vasopressin in the placental bed following placental separation during cesarean section in cases of placenta previa effectively reduced and arrested blood loss without any adverse effects. This is an easy procedure requiring minimal skills, not much technology, just anesthetic and obstetric teams are required. Also it reduces number of units of blood transfusions required. This might be a life saving and uterus salvaging measure which must be given a try before more complicated and risky procedures are carried out.

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