

**A prospective study on prophylactic SR suction cannula application in instrumental delivery for atonic PPH in tertiary care hospital**

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**Abstract**

**Background:** Postpartum haemorrhage still prevails to be the nightmare and the major cause of maternal morbidity. It is always sudden, unpredictable and catastrophic. In this study we use a simple, safe and cost effective specially designed cannula to reduce the blood loss.

**Aim:** To know the efficacy of SR suction cannula in the prevention of postpartum haemorrhage in instrumental pregnancy.

**Materials and methods:** A prospective randomised controlled trial with sample size of 100cases from Jan 2023-June 2023.The cases included are all instrumental deliveries that did not meet the exclusion criteria. Exclusion criteria: Clinically pale-post natally, other causes of PPH. They were divided into 2groups-Group A and Group B. In group A the prophylactic SR cannula was applied along with AMSTL and in group B only AMSTL was performed.

**Results:** In this study it was found that average age group of study were 24-36yrs. Comparing the Group B, Group A was 4only. minutes of early arrest of blood and 177.1 ml less amount of bleeding, which was statistically

significant the p valuesonly.e 0.000 for both So the time taken to arrest bleeding and the blood loss amount was significantly lower with SR cannula application than with AMSTL only

**Conclusion:** Based on our study we conclude that PPH is an emergency which can happen following delivery and the incidence of atonic PPH following instrumental delivery is around 2.5-3%. The prophylactic use averts bleeding catastrophically. Also being a simple cost-effective technique, it can be made part of every normal delivery and delivery trays. The negative suction produced in the uterine cavity is both lifesaving and fertility saving.

**Keywords:** SR, AMSTL, PPH.

**Introduction**

Globally, Postpartum hemorrhage accounts for about 25% of maternal death PPH may occur in 1-5% of deliveries in both developed and developing countries. In India, postpartum hemorrhage continues to be the leading cause of maternal mortality. Place of the delivery and severity of the hemorrhage determines the maternal outcome. Healthy trend of reducing MMR from 130 in 2014-2016 to 97 in 2018-2020.The EPMM (ending

preventable maternal mortality) target for reducing the global maternal mortality ratio (MMR) by 2030 was adopted as SDG target 3.1: reduce global MMR to less than 70 per 100 000 live births by 2030.

PPH is defined by FIGO “Any amount of bleeding that causes physiological deterioration of woman’s condition signified by low systolic BP, tachycardia, signs of shock” Active management of third stage of labor is a feasible, low-cost measure prevents 60-70% of atonic PPH. Despite the reduction of PPH using active management, about 1%–5% of births are complicated by severe PPH of greater than 1000 ml. This needs to be worked further and a prophylactic method should be adopted to reduce it further.

Diagnosis of PPH and making decision to transfer the patient to tertiary care is very crucial- “Golden hours”. Due to hemorrhagic shock some women slip into coagulation failure and the multiorgan dysfunction syndrome. According to MDG maternal mortality reduction can be achieved if only PPH management is prioritized. Many studies emphasized that maternal morbidity and mortality due to PPH can be prevented with prompt recognition and timely management.

### Aims and Objectives

1. To evaluate the efficacy of SR suction cannula in the prevention of postpartum haemorrhage in Instrumental deliveries
2. To compare the amount of blood loss in AMSTL and the amount of blood loss in vacuum retraction cannula in Atonic PPH.

### Materials and methods

100 women with different risk factors and who delivered through instrumental delivery were included in this study. Age parity and gestational age was recorded.all women who delivered through instrumental delivery and

developed secondary PPH were excluded and PPH due to other causes than atonicity was excluded.

### Review of literature

Postpartum hemorrhage (PPH) is defined as any blood loss >500 ml following vaginal delivery and >1000 ml after caesarean delivery -fall in hematocrit by over 10% necessitates transfusion of blood and blood products precipitates signs and symptoms of hypovolemia.

PPH can be grouped as follows:

1. Primary hemorrhage (within 24 hours);
  - minor (500-1000ml blood loss) • major (>1000ml blood loss): -moderate (1000-2000ml blood loss)-severe (>2000ml blood loss)
2. Secondary hemorrhage (between 24 hours and 6 weeks)
  - A. samartha ram h et al (2014) studied that creating negative pressure within the uterine cavity results in the shrinkage of uterus which aid the natural physiological process of retraction and contraction of uterus, thereby it stops atonic PPH
  - B. Bela makhija et al (2014) conducted study on 9 patients who developed atonic pph refractory to medical management. Author concluded that this technique is less challenging and can be used in low research setting that requires only minimal straining.
  - C. Purwosunu y et al (2016) used vacuum induced tamponade as an alternative approach to balloon tamponade in treatment of postpartum haemorrhage due to uterine atony.
  - D. Panicker (2017) proposed safe and simple technique for prevention and management of PPH thereby decreasing maternal morbidity and mortality.

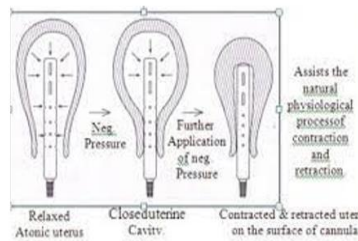
### Description about AMSTL

1. AMTSL is followed as per WHO recommendations.
2. Inj. Oxytocin 10 units given intramuscular, controlled cord traction and uterine massage.

3. Blood loss is measured by surgical drape.

**Description about vacuum retraction system**

1. Vacuum Retraction Cannula
2. Thick-walled flexible suction tube
3. Suction apparatus
4. Surgical drape and suction apparatus used for measurement of blood loss



**Results**

Age of the patient

| Group a vs group b |       |    |         |                |         |
|--------------------|-------|----|---------|----------------|---------|
|                    | Group | N  | Mean    | Std. Deviation | P value |
| Age                | A     | 50 | 24.5600 | 3.86063        | 0.790   |
|                    | B     | 50 | 24.3000 | 5.71518        |         |

High risk in both groups:

|                      | High risk |             |
|----------------------|-----------|-------------|
|                      | Frequency | Percent (%) |
| Prolonged labour     | 16        | 32          |
| Gdm                  | 7         | 14          |
| Ghtn                 | 8         | 16          |
| Multifetal pregnancy | 2         | 4.0         |
| Anaemia              | 54        | 48.0        |
| Polyhydramnios       | 6         | 12          |
| Pre-eclampsia        | 3         | 6.0         |
| Nil                  | 1         | 2.0         |
| Thrombocytopenia     | 1         | 2.0         |
| Oligohydramnios      | 2         | 4.0         |
| Total                | 100       | 100.0       |

OBS score of the patient:

| OBS score | Frequency | Percent (%) |
|-----------|-----------|-------------|
| Primi     | 44        | 44          |
| G2-g4     | 56        | 56          |
| Total     | 100       | 100.0       |

**Gestational age of the patient**

| Gestational age of the patient | Group a   |             | Group b   |             |
|--------------------------------|-----------|-------------|-----------|-------------|
|                                | Frequency | Percent (%) | Frequency | Percent (%) |
| <37 weeks                      | 1         | 2           | 4         | 8           |
| 37- 40 weeks                   | 29        | 58          | 30        | 60          |
| >40 weeks                      | 20        | 40          | 16        | 32          |
| Total                          | 50        | 100.0       | 50        | 100         |

**Clinical comparison of duration of third stage of labour, time taken to control bleeding, total blood loss,hb deficit in two groups**

| Parameters                                       |         | Mean     | Standard deviation | Mean difference | 95% confidence interval of the difference |        | P value |
|--|---------|----------|--------------------|-----------------|---|--------|---------|
|  |         |          |                    |                 | Lower                                     | Upper  |         |
| Duration of third stage of labour between groups | Group A | 3.2000   | 0.885              | 0.038           | 0.386                                     | 0.462  | 0.859   |
|  | Group B | 3.1620   | 1.223              |                 |   |        |         |
| Time taken to control bleeding in both groups    | Group A | 2.1970   | 0.541              | 4.445           | 4.896                                     | 3.994  | 0.000   |
|  | Group B | 6.6420   | 1.514              |                 |   |        |         |
| Total blood loss between groups                  | Group A | 174.0000 | 51.666             | 177.1           | 259.5                                     | 94.687 | 0.000   |
|  | Group B | 351.1000 | 289.072            |                 |   |        |         |
| Hb deficit between groups                        | Group A | 0.3460   | 0.163              | 0.002           | -0.062                                    | 0.066  | 0.951   |
|  | Group B | 0.3440   | 0.162              |                 |   |        |         |

**Discussion**

In our study group most of the patients age ranged from 21 to 25 years which accounted for around 45 percent of cases there is no statistical difference in the age of the participants in both groups

Our study is comparable to study done by samartha ram et al<sup>56</sup> where the age range was between 19- 33 years

similar to our study. Another study done by bela makhija et al<sup>57</sup> had age range between 22-36 years.

The most common risk factor being anaemia followed by prolonged labour. In a study done by majella et al<sup>58</sup> the prevalence of high-risk pregnancy among study participants were 18.3% which is bit lower in comparison

to our study. Anemia was commonest risk factor seen similar to study done by fukuami et al<sup>6</sup>

Almost half of the patients in our study group were primi while around 56 percent of the patients were multi gravida which is also an important factor for postpartum hemorrhage. In bela makhija et al<sup>58</sup> also majority of patients were multigravida. Usually, primi has low blood loss when compared to multigravida

Gestational age in our study group around 60% of patients belong to 36-40 weeks of gestational age. But in our study group around 32% of cases were postdated which may also been a factor influencing pph

There is no statistical difference in the duration of third stage of labor and hb deficit between groups of the participants in both groups. P values are 0.859 and 0.951 respectively. Comparing the group b, group a was 4.445 minutes of early arrest of blood and 177.1 ml less amount of bleeding, which was statistically significant the p values were 0.000 for both so the time taken to arrest bleeding and the blood loss amount was significantly lower with sr cannula application than with AMSTL only In samartha ram et al study there was no severe blood loss of severe grade, similarly in study done by purwosunu et al<sup>63</sup>.to there was minimal blood loss in patient using uterine cannula.

These results were similar to results of study done samartha ram et al<sup>56</sup> where bleeding stopped in less than 4 min after application of cannula, in one more study done by vasudev panicker<sup>62</sup> also had similar results.

### Conclusion

The strong negative suction in the uterine cavity resulted in sucking out all the blood and blood clots. Assists the physiological process of retraction and contraction of uterus.

Simple, safe, sure and inexpensive technique to control atonic PPH with absolute success.

This simple and cost-effective technique, takes very little time to organize and can stop bleeding within 4 minutes in atonic PPH as shown in this study.

This cost-effective technique is both lifesaving and fertility saving settings.

Vacuum retraction cannula should be made part and parcel of normal delivery tray the labor room staff and the staffs in the primary health care centers should be trained in this technique, so that bleeding can be stopped without any delay and also used in case of referral.

Its utilization in cases of inherited coagulopathies of pregnancy and dic has to be further explored.

The long-term application of sr vacuum suction cannula in atonic PPH management, it can lead to infection and ischemia on cervix and uterus due to vacuum effect. These complication of sr vacuum cannula in future can be further explored.

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