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RESEARCH ARTICLE

PROPHYLACTIC BLOOD COMPONENT THERAPY, "A SAVIOUR FOR OBSTETRIC PATIENTS AT HIGH RISK FOR COAGULOPATHY"

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ABSTRACT

Background: Prophylactic blood component therapy, "A saviour for obstetric patients with non overt DIC". {Dr Neena Gupta, Dr Shaily Agarwal, Dr Apurva Agarwal, Uruj jahan,Fatima Usmani, Poonam)
Aims: To evaluate the role of prophylactic blood component therapy in nonovert DIC patients to reduce maternal morbidity and mortality.
Methodology: This study was conducted on total 274indoor obstetric patients in the Department of Obstetrics & Gynaecology of UISEMH Kanpur from January 2016 to August 2017.
Results: In Group IB, majority were managed in ward (72.41%) only 13.79 % patients required ICU care but mortality was nil. While in group IA 20.63% needed ICU care and mortality was 1.59%. In group II (overt DIC) all required ICU care and mortality was 59.38%. Patients in group IB (prophylactic blood component therapy) had shorter duration of hospital stay as compared to group IA and II. 40.18% in group II (overt DIC), 33.92% in group IA and 6.92 % in group IB patients had hospital stay for more than 10 days.
Conclusion: Prophylactic blood component therapy corrected the coagulation abnormality and prevented them from landing up into established DIC.

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INTRODUCTION

International Society on Thrombosis and Haemostasis (2001) proposed the working definition of DIC be delineated into two phases. Non-overt DIC represents subtle hemostatic dysfunction while overt DIC is recognized as a decompensated phase (Van Dam *et al.,* 1989). Central to the diagnosis is a scoring system rooted in rapid and readily available tests. This would then enable the diagnosis to be utilized widely and serve as the reference standard for diagnostic and therapeutic purposes. The incidence and outcomes of obstetric DIC patients is incompletely defined. The prevalence of DIC in pregnancy ranges from 0.03 to 0.35 percent in population-based studies or 12.5 per 10,000 delivery hospitalizations in one study. Although the overall prevalence of DIC is low in pregnancy, the frequency of DIC in women with specific pregnancy complications can be quite high. Disseminated intravascular coagulation can arise from a variety of obstetrical and nonobstetrical causes. Obstetrical DIC has been associated with a series of pregnancy complications including the following:

1. Acute peripartum hemorrhage (uterine atony, cervical and vaginal lacerations, and uterine rupture);
2. Placental abruption;
3. Preeclampsia/eclampsia/hemolysis, elevated liver enzymes, and low platelet count syndrome;
4. Retained stillbirth;
5. Septic Abortion and intrauterine infection;
6. Amniotic fluid embolism; and
7. Acute fatty liver of pregnancy.

The ISTH DIC scoring system provides objective measurement of DIC. Where DIC is present the scoring system correlates with key clinical observations and outcomes. It is important to repeat the tests to monitor the dynamically changing scenario based on laboratory results and clinical observations.

Removal of the placenta is the linchpin to treatment in most cases but appropriate blood product support is also key to management. This is necessary because DIC itself can have pathological consequences that translate clinically into a worse prognosis for affected patients

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Table II. ISTH Diagnostic Scoring System for DIC.

Scoring system for overt DIC

Risk assessment: Does the patient have an underlying disorder known to be associated with overt DIC?

If yes: proceed

If no: do not use this algorithm

Order global coagulation tests (PT, platelet count, fibrinogen, fibrin related marker)

Score the test results

- Platelet count (>100 × 10^9/l = 0, <100 × 10^9/l = 1, <50 × 10^9/l = 2)
- Elevated fibrin marker (e.g. D-dimer, fibrin degradation products) (no increase = 0, moderate increase = 2, strong increase = 3)
- Prolonged PT (<3 s = 0, >3 but <6 s = 1, >6 s = 2)
- Fibrinogen level (>1 g/l = 0, <1 g/l = 1)

Calculate score:

≥5 compatible with overt DIC: repeat score daily

<5 suggestive for non-overt DIC: repeat next 1–2 d

Using cut off as 5, sensitivity is 93% and specificity is 98%.

MATERIALS AND METHODS

Selection criteria

All antenatal patients with high risk criteria for coagulopathy will be selected for the study.

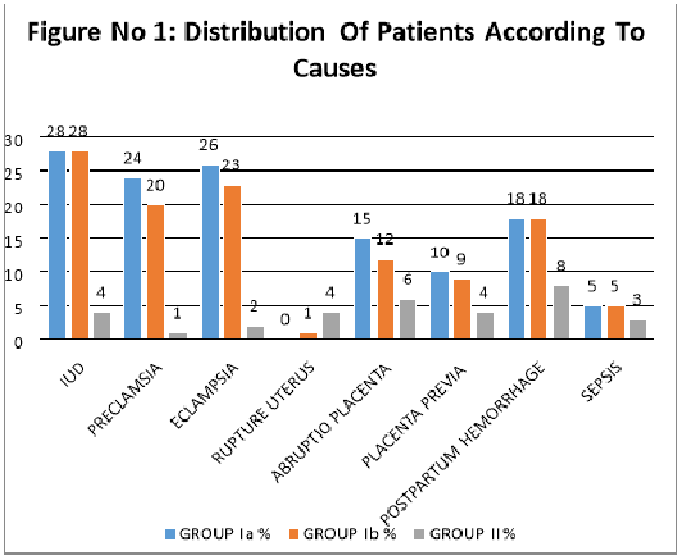
- Intrauterine Fetal Demise.
- Pre Eclampsia and Eclampsia.
- Placental Abruption
- Post Partum Hemorrhage
- Intrauterine Infection(Sepsis)
- Postabortal and postnatal cases of retained products of conception.
- Antenatal and post natal cases of established coagulopathy

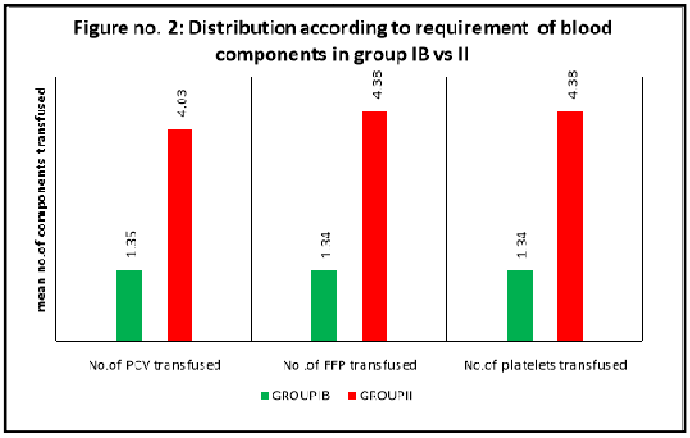
Exclusion criteria

- Antenatal patients eligible for the study but not given consent for the study.
- All antenatal patients with inherited coagulopathy.
- Written Informed consent was taken from all patients to be included in this study

These patients of divided into three groups based on the DIC score according to ISTH scoring system into Non Overt and Overt DIC groups

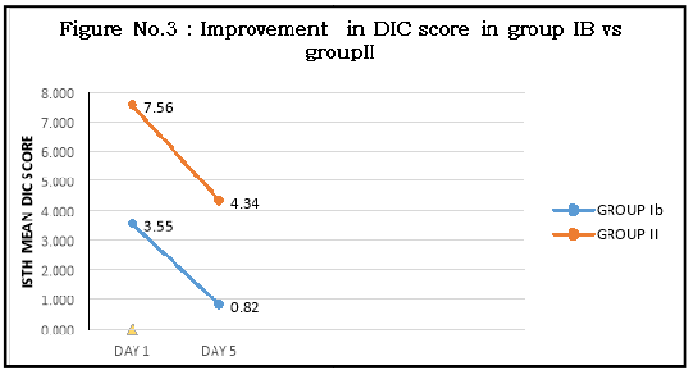
- Those with DIC SCORE <5 were grouped as IA and IB randomly and those with DIC score >/= 5 were grouped as II
- **Group IA -** non overt DIC (whole blood or Packed red cells were transfused in severely anemic patients){n=126}
- **Group IB -** Non overt DIC (All types of blood components. i.e. PCV, FFP and PLATELETS were given){n=116}
- **Group II -** Overt DIC (All types of blood components. i.e. PCV, FFP and PLATELETS were given) { n=32}.





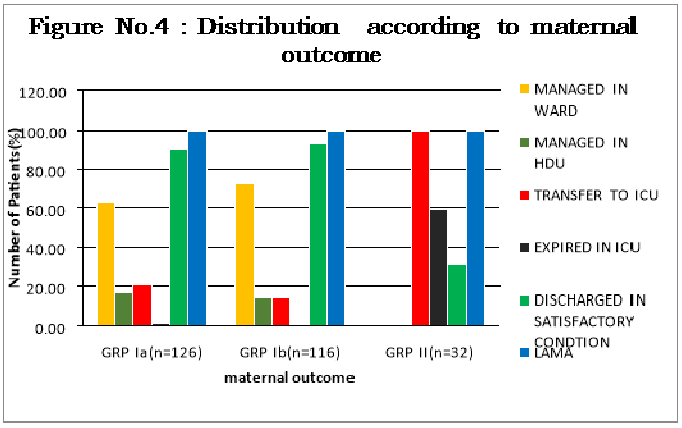
Observations

The main associated conditions with (Overt DIC group II) were post partum hemorrhage (25%) and abruptio placenta (18.7%). Main associated conditions with non Overt DIC were Intrauterine fetal demise, pre eclampsia and eclampsia (figure no.3).

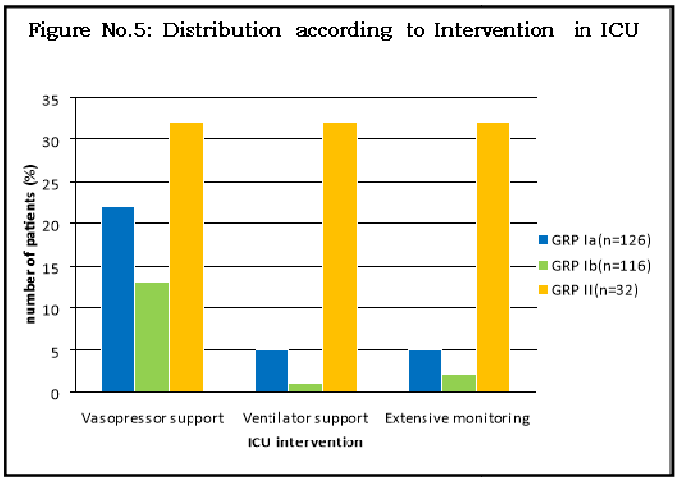


Mean no of blood components required in overt DIC(group II) patients was three times greater than that required in non overt DIC(group Ib) to correct the coagulation profile of the patients. Despite of vigorous component therapy mortality in group II was 59.38% while in Group Ib there was no mortality. Prophylactic components therapy was beneficial in decreasing maternal mortality in my study. The above figure shows the trend of improvement in DIC score over period of 5 days in group Ib (non overt DIC) and group II(overt DIC) The mean DIC score on day 1 of admission was 7.56 in overt DIC group

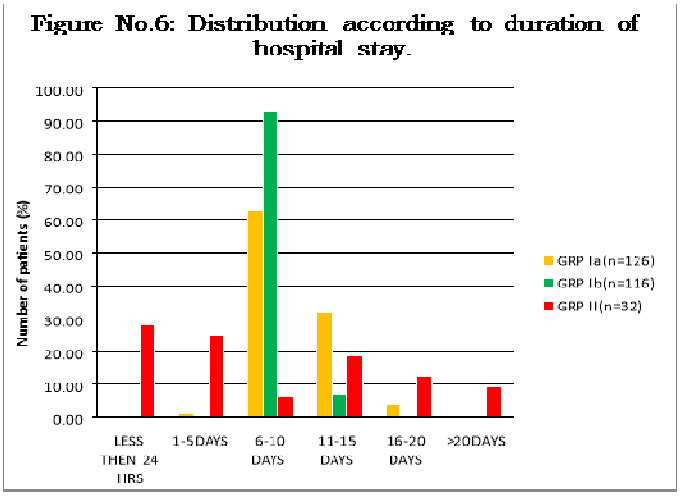
while it was 3.55 in non overt DIC group, however the rate of improvement was faster in group Ib. On applying chi quare test, for DOF 1, P value was 0.003 which showed the difference to be statistically significant.



The outcome in group Ib (non overt DIC) was better as only 13.79%patients needed ICU care, none expired and 93.10 % patients were discharged in satisfactory condition. In group II (overt DIC) 59.38 % expired, only31.25 % were discharged in satisfactory condition.



In group Ib (non overt DIC), vasopressor support, ventilator support and extensive monitoring were 11.21%,0.86% 1.72% respectively which was less as compared to group Ib. In group 2 (overt DIC),all the patients required both vasopressor and ventilator support and extensive monitoring in ICU.



In group Ia and Ib majority of patients had duration of stay less than 10 days, while in group Ib only 6.9 % patients had more than 10 days hospital stay. In group II (established DIC), although 19 patients (59.3%) had stay less than 5 days but, despite of ICU care and component transfusion these patients could not be revived. Among those who revived 25% had more than 10 days of stay, 9.39% had more than 15 days duration and 6.25% had more than 20 days of hospital stay

RESULTS

- In Group IB, majority were managed in ward (72.41%) only 13.79 % patients required ICU care but mortality was nil.. In group II (overt DIC) all required ICU care and mortality was 59.38 %.
- In group Ib, vasopressor support, ventilator support and extensive monitoring were 11.21%,0.86% 1.72% respectively which was less as compared to group Ib.

In group II (overt DIC), all the patients required both vasopressor and ventilator support and extensive monitoring in ICU.

- Mean no of blood components required in overt DIC(group II) patients was three times greater than that required in non overt DIC(group Ib) to correct the coagulation profile of the patients. Despite of vigorous component therapy mortality in group II was 59.38% while in Group Ib there was no mortality.
- Patients in group IB (prophylactic blood component therapy) had shorter duration of hospital stay as compared to grp II.

DISCUSSION

- (Figure No.1) In our study the main associated conditions with (Overt DIC group II) were post partum hemorrhage (25%) and abruptio placenta (18.7%). Main associated conditions with non Overt DIC were Intrauterine fetal demise, pre eclampsia and eclampsia. Kor – Anantakul O *et al* (2007)
- (Figure No.2), In our study, Mean no of blood components required in overt DIC(group II) patients was three times greater than that required in non overt DIC(group Ib) to correct the coagulation profile of the patients. Despite of vigorous component therapy mortality in group II was 59.38% while in Group Ib there was no mortality. prophylactic components therapy was beneficial in decreasing maternal mortality in my study.
- (Figure No.3) The DIC score of the all patients were calculated (as per ISTH scoring system) on day 1and 5 of admission and trend of improvement in mean DIC score was compared. Group IB vs II, the mean DIC score in group II was 7.56 ±0.5 while in group IB it was 3.55±0.5. In both groups blood component were given as per requirement but the rate of improvement in group IB was faster than overt DIC group.(p value = 0.003,showed the association to be stastically significant).
- (Figure No.4) In our study, Analysis of Maternal outcome showed following results

The outcome in group IB was better as only 13.79%patients needed ICU care, none expired and 93.10 % patients were discharged in satisfactory condition. In group II (overt DIC) 59.38 % expired, only31.25 % were discharged in satisfactory condition. Niyaz Ashraf *et al* (2014) maternal mortality was13%. In Sushil Chawla *et al* study, 0.26% of the total obstetric patients required ICU admission, which was similar to various other studies as shown**.**

- (Figure No.5) In group Ib, vasopressor support, ventilator support and extensive monitoring were 11.21%,0.86% 1.72% respectively which was less as compared to group Ib. In group 2 (overt DIC), all the patients required both vasopressor and ventilator support and extensive monitoring in ICU. Despite of all resuscitative measures, there was 59.38% mortality in this group Rachana Saha *et al* (2013) Inotropic support was received by six patients (12%), CVP monitoring was done in three patients (6%).
- (Figure No.6.). In group IB only 6.9 % patients had more than 10 days hospital stay. In group II (established DIC), although 19 patients (59.3%) had stay less than 5 days but, despite of ICU care and component transfusion these patients could not be revived. Among those who revived 25% had more than 10 days of stay, 9.39% had more than 15 days duration and 6.25% had more than 20 days of hospital stay. According to Raksha Sharma *et al* (2016) the mean length of stay in ICU was 5.6 days.

Conclusion

- Average consumption of blood components were more in established DIC (group II)of patients as compared to non established ones(group IB), to correct the coagulopathy.
- Rate of correction of the coagulopathy (i.e. improvement in DIC score) was faster in group IB patients as compared to group II (established DIC).
- Prophylactic blood component therapy corrected the coagulation abnormality in such patients at earlier stage and prevented them from landing up into established DIC thereby decreasing maternal morbidity and mortality.
- Although blood component therapy is recommended in established DIC group of patients, but despite of aggressive blood component therapy these patients, being critical, have prolonged duration of hospital stay, required ICU care for long time and despite of all this morbidity and mortality is high in such patients.

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