

THE ROLE OF BLOOD COMPONENT THERAPY IN OBSTETRICS (A study of 100 cases with deranged coagulation profile)

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ABSTRACT

Objectives: This study was carried out to study the incidence of DIC in various obstetric conditions and to study the role of component therapy and its effects on the deranged coagulation profile and maternal outcome in patients with deranged coagulation profile.

Materials and Methods: An observational retrospective study design was selected for this study. A total of 100 cases that had presented to labour room of our hospital between January 2013 and January 2014 with deranged coagulation profile were studied for improvement in maternal outcome after giving component therapy. All the antenatal women admitted and having alteration in any of the following laboratory parameters were included in the study (Hb, Platelet, PT, INR, aPTT, Sr. fibrinogen). Patients having jaundice due to obstetric condition (excluding any infective etiology like hepatitis or other hepatic conditions) were included. Any patient having just altered hemoglobin suggestive of anemia and transfused with red cell concentrate for the same were excluded. Any patients with medical condition like ITP, SLE, and Dengue etc. that can alter coagulation profile were excluded.

Results: 21 patients tested positive for D-dimer i.e. 21 patients had DIC among 100 patients with deranged coagulation profile during study period. Incidence of DIC in our study was 0.002%. Out of patients with DIC, 42.85% had IUFD, 42.85% severe pre-eclampsia, 30.49% abruptio placenta, 19.04% eclampsia and 14.28% had PPH. Incidence of DIC in PPH- 60%, abruptio placenta 23.07%, severe pre-eclampsia 23.07%, eclampsia 22.22% and 20.8% in IUFD.

Keywords: Deranged coagulation profile, DIC, Abruptio placenta, Eclampsia, and IUFD.

INTRODUCTION

The most interesting of acquired hemostatic diseases is Disseminated Intravascular Coagulation, a term coined by Hardaway and McKay in 1959. However, other terminology has been used for the condition at different times i.e. Defibrination (Soulier et al, 1952), Fibrination (Engstrom, 1953), Consumption coagulopathy (Lasch et al, 1961), Intravascular coagulation with fibrinolysis (Owen et al, 1964), Intravascular defibrination (Schneider, 1952), Consumptive thrombohemorrhagic disorders (Marder et al, 1987), Abnormal proteolytic activity (Sharp 1977).¹

Pregnancy is accompanied by changes in the hemostatic system, resulting in hyper coagulable states, ranging from venous thromboembolism to DIC.^{2,3} Disseminated intravascular coagulation is always a secondary phenomenon triggered by specific disorders.^{2,4} Obstetric conditions associated with DIC includes pre-eclampsia, eclampsia, abruptio placentae, intrauterine infection, retained dead foetus, placenta accreta, hydatidiform mole, prolonged shock and amniotic fluid embolism.⁵ DIC occurs in approximately 10% cases of mild and 24% cases of severe abruptio placentae. It is seen in 42.8% patients with eclampsia, 2-4% cases of pre-eclampsia with HELLP (Hemolysis Elevated Liver Enzymes Low Platelets) syndrome and 14.2% cases

after intrauterine death.^{6,9} DIC is the most common maternal complication with a reported frequency varying from 4-38%.^{7,8}

The main stay of treatment of DIC is to restore and maintain the circulating volume; it not only prevents renal shutdown and further hemostatic failure due to hypovolemic shock but also clears FDPs which themselves act as potent anticoagulant. A spontaneous recovery from the coagulation defect is to be expected once the uterus is empty and well contracted, provided that blood volume is maintained by adequate replacement. Vaginal delivery will make a less severe demand on the hemostatic mechanism than delivery by caesarean section.

The decision of blood transfusion is both clinical and hematological. Using a high ratio of Packed RBCs to FFP (1.5:1 or 1:1) with the goal of maintaining INR <1.5- 1.7 has shown Ti=O improve survival from OB hemorrhage. Using 6-10 units of Cryoprecipitate, richer in fibrinogen than FFP to maintain fibrinogen level above 150 mg/dl. And above all PRP, PC and SDP for correction of the most common coagulation abnormality i.e. thrombocytopenia.

RESULTS AND DISCUSSION

A total of 100 cases with deranged coagulation profile were studied during the study period. Only 36% were booked cases and the rest all

were un-booked cases. Majority of them fell in the age group of 20-29 years; mean age of distribution was 25.01 years and median age 25.5 years. The mean gestational age in this study was 33.07 weeks and median gestational age was 34.41 weeks, with 47% being prim gravida, 40% multi, and 13% grand multipara. 21 patients tested positive for D- dimer i.e. 21 patients had DIC among 100 patients with deranged coagulation profile during study period. Incidence of DIC in our study was 0.002%.

Table 1: Correlation of maternal age

| Maternal Age (Years) | Total No. of Cases with deranged coagulation profile (n=100) | No. of Cases with DIC (n=21) | Percentage % of cases with DIC |
|----------------------|--|------------------------------|--------------------------------|
| <20 | 2 | 1 | 4.76 |
| 20-24 | 45 | 7 | 33.33 |
| 25-29 | 30 | 9 | 42.85 |
| 30-34 | 22 | 3 | 14.28 |
| >35 | 1 | 1 | 4.76 |
| Total | 100 | 21 | 100 |

Table 2: Correlation of gestational age

| Gestational Age (Weeks) | No. of cases with deranged coagulation profile (n=100) | No. of cases with DIC (n=21) | Percentage % of cases with DIC |
|-------------------------|--|------------------------------|--------------------------------|
| <28 | 12 | 4 | 19.04 |
| 29-33 | 32 | 8 | 38.09 |
| 34-36 | 43 | 5 | 23.80 |
| 37-40 | 12 | 3 | 14.28 |
| >40 | 1 | 1 | 4.76 |
| Total | 100 | 21 | 100 |

The obstetric conditions associated with DIC are listed in table- . The three foremost of them were IUFD 49%, Abruptio placenta 39%, and Pre-eclampsia 39%. And these three conditions contributed to the incidence of DIC as 0.83 % in IUFD, 23.07% in Abruptio and 23.07% in pre-eclampsia.

Table 3: Incidence of DIC in various obstetric conditions

| Obstetric condition | Total no. of cases | No. of cases with DIC | Incidence of DIC |
|---------------------|--------------------|-----------------------|------------------|
| Abruptio Placenta | 39 | 9 | 23.07 |
| IUFD | 48 | 10 | 20.83 |
| Pre-eclampsia | 39 | 9 | 23.07 |
| Eclampsia | 18 | 4 | 22.22 |
| PPH | 5 | 3 | 60 |

In this study of 100 cases, 72 delivered vaginally, 1 had instrumental vaginal delivery and 26 had to undergo caesarean section.

Most common coagulation abnormality was Thrombocytopenia (95%), followed by Prolonged PT (92%) and Hypo-fibrinogenemia (74%). The two most commonly transfused component bags in the study were of PRP followed by FFP.

After appropriate component therapy, out of 95 cases with thrombocytopenia, 66.31% reached platelet count >1, 50,000/cumm, 26.31% reached >1, 00,000 /cumm. Out of 91 cases with prolonged PT, 60.43% acquired normal PT. Out of 74 cases with fibrinogen< 150mg/dl, 68.92% reached fibrinogen >150mg/dl.

Table 4: Details of blood component transfused

| Types of Blood Component Transfused | No. of Bags Transfused | Component Transfused in Patients with DIC |
|-------------------------------------|------------------------|---|
| Packed Red Cell Concentrate RCC | 246 | 81 |
| Fresh Frozen Plasma FFP | 352 | 120 |
| Platelet Rich Plasma PRP | 543 | 172 |
| Single Donor Platelet SDP | 17 | 10 |

Table 5: Improvement in Coagulation Profile with Blood Component Therapy

| Platelet Count | No. of cases with deranged coagulation profile (n=100) | | No. of Cases with DIC (n=21) | |
|--|--|------------------|------------------------------|------------------|
| | Pre Transfusion | Post Transfusion | Pre Transfusion | Post Transfusion |
| Normal (1,50,00-4,50,000)/cumm | 5 | 63 | 0 | 7 |
| Mild Thrombocytopenia (1,00,000-1,50,000)/cumm | 39 | 25 | 0 | 9 |
| Moderate Thrombocytopenia (50,000-1,00,000)/cumm | 41 | 6 | 12 | 1 |
| Severe Thrombocytopenia (<50,000)/cumm | 15 | 6 | 9 | 4 |

| Coagulation Profile | No. of cases with deranged coagulation profile (n=100) | | No. of cases with DIC (n=21) | |
|---------------------|--|------------------|------------------------------|------------------|
| | Pre Transfusion | Post Transfusion | Pre Transfusion | Post Transfusion |
| Normal PT | 9 | 62 | 1 | 9 |
| Prolonged PT | 91 | 38 | 20 | 12 |
| Coagulation Profile | No. of cases with deranged coagulation profile (n=100) | | No. of cases with DIC (n=21) | |
| | Pre Transfusion | Post Transfusion | Pre Transfusion | Post Transfusion |
| Normal | 45 | 81 | 2 | 17 |
| Hypo fibrinogenemia | 55 | 19 | 19 | 4 |

In this study, 14 maternal mortality were noted. Out of the 79 cases with deranged coagulation profile, with component therapy, life of 70 mothers was saved. And out of 21 cases with DIC, life of 16 mothers was saved with component therapy. In our study mean hospital stay comes out to be 8.2 days and it is 10.9 days in patients with DIC ; 19% patients with deranged profile had ICU admission in our study and out of the 21 patients with DIC ,12 patients did not required ICU care and support and with appropriate component therapy were discharged after recovery. 9 out of the 21 cases had ICU admissions; out of which 4 patients recovered and were discharged thereafter and 5 patients died.

DISCUSSION

In our study the incidence of DIC is 0.002%. Incidence of DIC in abruptio placenta is 23.07% which is as good as 4-38 % quoted by Sibai et al 1992. That in pre-eclampsia is 23.07% in our study, which is quoted 38% by B. Namavar et al 2002. And incidence of DIC in IUFD in our study is 20.83% which is closer to 19% quoted by R. Patel et al 2013.

In this study, 14 maternal mortality were noted. Out of the 99 delivered babies, 47 were still born, 52 live births, 26 had NICU admissions and 11 had neonatal deaths.

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