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MATERNAL AND FETAL OUTCOME IN CASES OF DISSEMINATED INTRAVASCULAR COAGULATION

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ABSTRACT

BACKGROUND: At present time, obstetrical bleeding remains to be the world wide main cause of maternal mortality. Early identification of factors leading to haemorrhage and rapid management of underlying pathological process is the key stone of the treatment. Most important pregnancy related condition leading to bleeding with high mortality and morbidity is DIC.

METHODS: The study was a retrospective study conducted in the Department of obstetrics and Gynaecology, civil hospital, ahmedabad between the period of Jan 18 to Jan 19. 70 patients who were diagnosed having DIC were included in the study. All the patients were studied retrospectively in terms of parity, mode of delivery, perinatal outcome, maternal ICU admission , need for blood and blood products , need for obstetric hysterectomy, need for dialysis, underlying cause and according to DIC SCORING SYSTEM into overt and non overt DIC and according maternal outcome.

RESULT: Majority of patients were emergency cases i.e.72% because our institute is a tertiary care centre. Most of cases were multigravida and delivered vaginally. Major underlying causes were abruption, septicaemia and PPH. Majority patients were anemic and required blood and blood products. 20% patients required ICU admission, 16% required hysterectomy and maternal mortality was 23% and perinatal and neonatal mortality was 38%.

CONCLUSION: DIC is a major cause of maternal and perinatal mortality. So early recognition and investigation of antecedent causes and active management of DIC may help to lower this mortality as well as morbidity

KEYWORDS : DIC: Disseminated Intravascular Coagulation. PPH: Postpartum Haemorrhage. ICU: Intensive care unit. FDP: Fibrin degradation products. MODS: Multi organ dysfunction. OH: Obstetric hysterectomy.

INTRODUCTION

Disseminated Intravascular Coagulation is a complex systemic thrombohemorrhagic disorder characterised by systemic activation of blood coagulation system which results in generation and deposition of fibrin, leading to microvascular thrombi in various organs and contributing to the development of multi organ dysfunctions(MODS). This trigger of coagulation cascade leads to significant thrombin production which perpetuates its own formation very little time regulatory factors like antithrombin, Protein C, Protein S are consumed. Consumption and subsequent exhaustion of coagulatory proteins and platelets may induce severe bleeding complications. In normal physiological state plasmin is responsible for degradation of fibrin into fibrin degradation products (FDP),In DIC , activity of plasmin is significantly increased leading to generation of significant amount of FDP which have powerful anticoagulant property leading to bleeding tendency. Several mechanism may play role in pathogenesis :

(1) Tissue factor mediated thrombin generation
(2) Dysfunctional physiologic anticoagulant mechanism
(3) Depressed fibrinolytic system
(4) Inflammatory reaction.

Main causes for DIC in obstetrics are Placental Abruption(M/C), Septicemia, Intrauterine fetal Death, Preeclampsia-Eclampsia sequence, Amniotic fluid embolism...

Incidence among pregnant women is approximately 0.03 to 0.35.

PT , aPTT , D-dimer , FDP , Fibrinogen level like reports point out towards DIC.

International Society on Thrombosis and Hemostasis (ISTH) have introduced DIC Scoring System which classify DIC into Overt and non Overt. DIC score 5 or more suggest overt DIC and less than 5 suggest non overt DIC; which includes parameters like platelet count, D-dimer , FDP, fibrinogen and PT , aPTT. Maternal mortality ratio is higher in cases of overt DIC. DIC is also associated with higher fetal and perinatal mortality as well.

Management includes primarily removal of underlying cause. In case of obstetric catastrophy , primary aim is to deliver appropriate obstetric care. Blood and Blood component are useful. Replenishment of coagulation factors , plasma and platelet substitution is useful.

Prognosis depends on underlying disease. Maternal mortality varies from 10 to 12 percent. If overt DIC is there , outcome would be worse .perinatal mortality varies from 25 to30 percent.

Recombinant human activated protein C , Recombinant Factor 7a , Tranexamic acid, Epsilon aminocaproic acid (potent antifibrinolytic)

Under trial : NAPc2 (Nematode anticoagulant peptide c2) inhibits initiation of cascade at TF –factor 7a – factor 10a .Hirudin is a direct thrombin inhibitor Antiselectin antibody and IL 10 are under trial.

AIMS AND OBJECTIVES OF STUDY

- To know the incidence of DIC in obstetrics in our institute
- To study the risk factor and etiology of DIC in pregnancy
- To study the prognosis of mother and baby with DIC in pregnancy
- Evaluate clinical profile and management of patients with DIC in pregnancy

METHODS

The study was a retrospective study conducted in the Department of obstetrics and Gynecology, civil hospital, ahmedabad between the period of Jan 18 to Jan 19. 70 patients who were diagnosed having DIC were included in the study. All the patients were studied retrospectively in terms of parity,

mode of delivery, perinatal outcome, maternal ICU admission, need for blood and blood products, need for obstetric hysterectomy, need for dialysis, underlying cause and according to DIC SCORING SYSTEM into overt and non overt DIC and according maternal outcome .

INCLUSION CRITERIA:

- Pregnant patients (only obstetrics)
- Abnormal coagulation study

EXCLUSION CRITERIA:

- Non pregnant patients
- Underlying other medical conditions leading to DIC

(Ovarian cancer, uterine cancer, breast cancer, paraneoplastic syndrome

MAIN PARAMETERS ASSESSED DURING STUDY

- Parity
- Underlying cause
- Mode of delivery
- Need for Blood and blood products
- Perinatal outcome
- Maternal outcome
- Need for ICU
- Need for dialysis

The data was analysed using Microsoft Excel software version.

RESULTS

70 patients who diagnosed DIC were assessed in terms of their parity, mode of delivery, perinatal outcome, maternal outcome, need for Blood and Blood products , need for ICU , need for dialysis and maternal mortality.patients also classified into Overt and NonOvert DIC and assessed in terms of severity of outcome.

TABLE 1 : BOOKED VS EMERGENCY:

CASES	NO	%
Booked	20	28
Emergency	50	72

72% of cases were emergency cases which were referred from outside CHA , being a tertiary care centre and only 28% of cases were already booked in ANC OPD in civil hospital.

TABLE 2 : GRAVID STATUS:

GRAVIDA	NO	%
Primi	15	21
Second	17	25
Multi	38	54

21 % of patients who developed DIC were primi, 25 % patients were second and 54 % of patients were multigravida. From these results it showed that majority of patients were multigravida.

TABLE 3: UNDERLYING CAUSE

UNDERLYING CAUSE	NO	%
Abruptioplacenta	20	29
Septicemia	18	26
Intrauterine fetal death(IUFD)	10	14
Postpartum Haemorrhage(PPH)	10	14
Pregnancy induced hypertension(PIH)	09	13
Amniotic fluid embolism	03	04

Out of 70 patients who developed DIC , PIH was found to be an underlying cause in 13% of patients. Other underlying causes were IUFD in 14% of patients , septiemia in 26% of patients , abruptioplacenta in 29% of patients , amniotic fluid embolism in 4 % of patients and PPH was present in 14% of patients. It showed that common underlying cause for DIC in obstetrics patients were Abruptio Placenta , Septicemia , PPH and preeclampsia-eclampsia.

TABLE 4 : MODE OF DELIVERY:

GRAVIDA	NO	%
Normal	57	82
CS	13	18

82 % patients were delivered normally and in 18% of patients caesarean section was performed . out of 11 patients who underwent C-section , only 4 were operated in our institute . The rest were operated outside . 4 patients who were operated for C-section in our institute , 2 were operated for Eclampsia and 2 were operated for Abruption.

TABLE 5: ICU ADMISSION

ICU ADMISSION	NO	%	MMR NO	%
Yes	21	30	16	76
No	49	70	00	-

30% of patients needed Intensive Care support while 70% needed not. While maternal mortality ratio was quite high when patient needed ICU support .

TABLE 6 : NEED FOR BLOOD COMPONANT

BLOOD COMPONANT	NO	%
PCV,FFP,PRC,CRYO	21	30
PCV,FFP,PRC	28	40
FFP,PRC,CRYO	8	12.5
FFP,PRC	7	10
PCV,PRC	5	7.5

77 % of patients needed blood(PCV) transfusion. While almost all patients neseded blood products like FFP(Fresh Frozen Plasma), PRC (Platelet Rich Concentrate) and Cryoprecipitate.

TABLE 7 :NEED FOR DIALYSIS

NEED FOR DIALYSIS	NO	%
Yes	5	6
No	65	94

very few patients of DIC needed dialysis, approximately around 6%.

TABLE 8 :NEED FOR OBSTETRIC HYSTERECTOMY

NEED FOR OH	NO	%
Yes	11	16
No	59	84

Obstetric hysterectomy (OH) was needed in 16% of patients. 11 patients were undergone obstetric hysterectomy ,out of which 6 patients were undergone subtotal while other were undergone total hysterectomy. 8 patients (73%) were outside delivered who underwent obstetric hysterectomy.Majority of patients who underwent obstetric hysterectomy were multipara.

TABLE 9: FETAL OUTCOME

FETAL OUTCOME	NO	%
IUD	23	33
SB	2	3
NEONATAL DEATH	7	10
DISCHARGE	38	54

Out of 70 cases 23 (33%) patients had IUD, 2(3%) cases were stillbirth(SB), 7 (10%) cases were neonatal death and (38%) healthy babies were discharged. So total perinatal mortality was 46% which was comparable with study conducted by NAZ H et al. Perinatal mortality was 47.5% and Humaira naz et al

study had 47.5% perinatal mortality.

TABLE 10: CAUSE OF DEATH-MATERNAL OUTCOME

CAUSE	NO	%
HEMORRHAGIC SHOCK	4	25
ARF	2	13
SEPTICEMIA	5	31
HELLP	4	25
PULMONARY EDEMA	1	6
TOTAL	16	100

Out of 16 death cases, hemorrhagic shock and HELLP were responsible for 4 death case (25%), septicaemia was responsible for 5 cases(31%). ARF was seen in 2 cases while in 1 case pulmonary edema was an underlying cause.

TABLE 11: MATERNAL OUTCOME ACCORDING TO DIC SCORING SYSTEM

	NO	%	MMR NO	%
OVERT DIC	14	20	11	78
NON -OVERT DIC	56	80	05	09

We have also counted DIC score according to DIC SCORING SYSTEM and we found that maternal outcome was worse in OVERT DIC patients than NON-OVERT DIC patients .In OVERT DIC patients , maternal mortality was approximately 78 % which was only 9 % in NON-OVERT DIC.

DISCUSSION

In our study 70 patients were included which were diagnosed as a case of DIC. Patients found to have consumptive coagulopathy. Coagulation study was found to be abnormal and then patients were assessed for their gravid status , underlying cause, need for ICU admission, need for blood and blood products, need for obstetric hysterectomy, need for dialysis, perinatal and fetal outome and also for maternal outcome.

In present study, majority were multigravida approximately 54 % followed by primigravida (21%) . Other similar study by Humaira naz. et al had similar findings i.e. majority of patients were mltigravida, their property being 3.17+- 2.56 .

In present study , majority are vaginal delivered i.e. 58 (82%) followed by Caesarean section i.e. 11(18%) . Obstetric hysterectomy was performed in 11 patients (16%) , out of which 6 patients were undergone subtotal and 5 patients were undergone total hysterectomy.another similar study by Kor-anantakul O et al was carried out in Songklanagarind university hospital from January 1993- December 2005, in which 25 obstetric patients with diagnosed cases of DIC were reviewed and in this study caesarean section was performed in 10 patients (40%) and hysterectomy was performed in 9 patients (36%) . Another similar study by Humaira naz et al showed that mode of delivery of 34(85%) patients was by Caesarean section and vaginal delivery occurred in 3 (7.5%) patients . eleven (27.5%) patients had hysterectomy.

In present study major risk factor for DIC was abruptio placenta i.e. 20(28%). Next common risk factors were Septicemia 18(25%), Intra uterine death 10(14%), Post partum haemorrhage(PPH) 10(14%) , Preeclampsia-Eclampsia 09(13%) and lastly least common was Amniotic fluid embolism in 3(4%) patients . Other similar study by Darrien D.et al also showed that PPH was most common cause of DIC. Another similar study by Dr, Neha Gupta et al included all patients with DIC in pregnancy and postpartum period admitted in Choithram hospital. In this study , most common cause of DIC was also PPH.i.e. in 12 (38.7%) out of 31 patients and next common cause was abruption i.e. in 9 (29%) patients followed by preeclampsia /eclampsia /HELLP syndrome in 10(31.7%) patients and IUD in 4 (12.9%) patients . In a study by Humaira naz et al major risk factor for DIC was eclampsia (70%) and next common risk factor was abruptipon (17.5%). In A. Ghaazi , N.M.Siddiq et al study, most common risk factor in DIC was also eclampsia i.e . 48.7% and second most common risk factor was abruption placenta .

In present study , majority of patients did not need ICU care , out of 70 patients only 14 (20%) patients were admitted in ICU. 56 patients need not ICU care . principally need for ICU care depends upon underlying condition that leads to DIC. Generally patients of Eclampsia and PPH who developed DIC need ICU support. Different study also showed that when underlying cause is PPH and eclampsia than ICU admission rate was higher.

In present study almost all patients required blood products like PCV, PRC, FFP and CRYOPRECIPITATE. In this study out of 70 patients , 54 patients(77%) needed PCV. So ideally speaking, all DIC patients were managed in tertiary care centre where all blood products were available 24*7 hours. Another study by Kor-anantakaul O et al was similar to this study i.e . almost all patients received blood component replacement.

In present study out of 70 patients , 16 patients were expired so mortality was 23% and 77 % patients were discharged . By enlarged mortality also depends upon underlying cause for DIC. Where PPH and eclampsia were major cause for DIC mortality rate is higher . Other similar study by Munoz MC ,Montes R and Hermida J et al showed that mortality due to DIC was 25% comparable to our study. Study by Kor-anantakul O et al showed that mortality was 24% and Humaira naz et al study result showed that mortality is 25%.DIC is one of the most common critical and life threatening condition and common cause for mortality in obstetrics.

In present study out of 70 patients , perinatal and fetal demise occurred in 32 cases where 38 babies got discharged. So fetal /perinatal demise ratio was 46%. Other study by NAZ H et al showed that perinatal mortality was 47.5% and Humaira Naz et al study had 47 % perinatal mortality.

In present study where DIC score was 5 or more than 5 that means patients having overt DIC had higher maternal mortality rate compared to non-overt DIC . In patients having overt DIC mortality was approximately around 78%.

CONCLUSION

From the present study it can be concluded that

- At present the diagnosis of DIC relies on clinical manifestations and laboratory tests .Diagnosis of DIC cannot be made on a single laboratory value , but rather the constellation of laboratory markers and consistent history of an illness known to cause DIC. Laboratory markers of DIC such as PT INR, Platelet count, FDP and D-dimer which is useful to predict maternal morbidity and mortality.
- Most common cause of DIC was Abruption and second most common cause was Septicemia and PPH. Almost all the patients were anemic and required blood and blood components .It was concluded that with decreased platelet count and increased INR mortality increased.
- DIC is major cause for maternal morbidity and maternal mortality.
- So it was recommended that recognition of the antecedent cause and early investigation for and active management of DIC may help lower this morbidity.
- Despite of rarity, systemically searching for DIC should be added to treatment algorithm in the management of known obstetrical antecedents , because treatment delays may significantly delays may significantly worsen

prognosis .
- In particular, the prompt management and arrest of postpartum haemorrhage

Before the need for massive transfusion and its attendant coagulopathy , earliest and adequate management of pre eclampsia and eclampsia and prevention of septicaemia are the lessons from this study.

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