

Cerebrovascular Accidents in Pregnancy and Puerperium; Study of Epidemiology, Causative Factors, Diagnosis, Treatment and Prognosis in Tribal Population of South Rajasthan

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Abstract

15% of maternal deaths in pregnancy and postnatal period are due to cerebrovascular accidents (1). Severe pre eclamptic toxemia, eclampsia, genital tract infection and operative delivery are major contributors (2). The study has been undertaken to find potential risk factors for peripartum or postpartum stroke and intracranial venous thrombosis and prevention of catastrophe. All pregnant and puerperal patients at Pacific Institute of Medical Sciences, Village Umarda, Ambua Road, Udaipur Rajasthan have been selected for the study for the duration of three years from 2014 to 2017. There were total 12 cases of cerebrovascular accident in pregnancy and puerperium. It is a retrospective study and risks were calculated on the basis of age, parity, mode of delivery, socio economic status, presence or absence of pre eclampsia. It has been observed that Stroke was more common in age more than 31 years (41.66%) para three and more (75%) post partum (41.66%) caesarean delivery (58.33%) severe pre eclampsia (58.33%). 33.33% were tobacco users and 66.66% were severely anemic and there were 16.66% maternal deaths. Regular antenatal checkup, prevention of preeclampsia and infection can bring down maternal mortality and morbidity to minimum.

Sub Arachnoid Hemorrhage; Pre- Eclamptic Toxemia; Eclamptic Encephalopathy; Post partum Cerebral Angiopathy; Cerebrovascular Complications in Pregnancy and Postpartum Period; Hemorrhagic Stroke.

Introduction

Cerebrovascular accidents in pregnancy and puerperium are uncommon [1] but carry high mortality and morbidity and contribute to approximately 12 % of all maternal deaths [2]. Pregnancy and puerperium may be complicated with many neurologic disorders, such as eclampsia, pseudo tumor cerebri, stroke, obstetric nerve palsies, subarachnoid hemorrhage and pituitary tumors and metastasis of chorio carcinoma [3]. Maternal mortality from severe pregnancy induced hypertension and eclampsia, which ranges from 0 to 14%, can be due to intra cerebral hemorrhage, pulmonary edema, disseminated intravascular coagulation, abruptio placentae, or failure of the liver or kidneys [4]. Fetal mortality ranges from 10 to 28% and is directly related to decreased placental perfusion [5]. Pseudo tumor cerebri can be associated with serious visual complications [6]. The risk of stroke in the pregnant patient is 13 times the risk in the non pregnant patient of the same age [7]. The major causes of stroke in pregnant patients are cerebral infarct, intracerebral hemorrhage and cerebral venous thrombosis [8]. Other neurological problems associated with pregnancy include Lumbar disk prolapse and lumbosacral plexus injuries which can occur during labor or delivery [9]. In addition, peripheral nerve compression or

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entrapment syndromes are thought to be caused by the retention of fluid during pregnancy [10]. The incidence of subarachnoid hemorrhage during pregnancy is 1 in every 10,000 patients, a rate 5 times higher than in nonpregnant women. Proliferation of prolactin-secreting cells, in the the pituitary gland causes enlargement and small tumors become symptomatic [11]. The incidence of chorio carcinoma is 1 in 50,000 full-term pregnancies but 1 in 30 molar pregnancies. This malignant tumor has a high rate of cerebral metastatic lesions [12]. In addition to these disorders that develop during pregnancy, the pregnant state can affect numerous preexisting neurologic conditions, including epilepsy, headaches, multiple sclerosis, myasthenia gravis, spinal cord injury, and brain tumors [13].

Material and Methods

This being a retrospective study the old records were reviewed by the author for maternal age, parity, education, socio-economic status and period of gestation. Pre-existing maternal disease, obstetric

complications, drug and medication use, tobacco use, maternal symptoms, physical findings, laboratory studies, imaging studies, fluid balance, tocolytic use and type, evidence of pre-eclampsia, infection, and therapeutic measures type of delivery normal or caesarean section were also recorded. Puerperal period events and complications were recorded. The probable cause of cerebro vascular accident was determined by the author based on history, physical examinations, and laboratory and radiologic findings. CT, MRI and Angiography are the Mainstay of Diagnosis. In a few cases, more than one attributable cause was possible, and in those cases, the most likely diagnosis was chosen. Pregnancy outcomes included gestational age at delivery, birth weight, mode of delivery, and Apgar scores. Applied therapies such as supplemental oxygen, need for ventilator support, fluid restriction, diuretic usage, cessation of tocolytics, antihypertensive use, termination of pregnancy, and anti-biotic, anti convulsants mag sulf and thrombolytic drugs.

Observations

Table 1: Age distribution

Age in years	No of patients	Percentage
Less than 20	2	16.67
21- 25	2	16.67
26-30	3	25.00
31 and above	5	41.66
	12	100

Maximum cases 8(66.66%) were more than 26 years of age.

Table 2: Parity

Parity	No of patients	Percentage
nulliparous	2	16.67
Para 1	1	8.33
Para 2	0	0.00
Para 3 and above	9	75.00
	12	100

9 (75.00%) cases were multipara three and above.

Table 3: Associated factors

Associated Factors	No of Patients	Percentage
Severe PIH	8	66.66
eclampsia	5	41.66
Gestational period		25.00
28- 30 weeks	3	58.33
31-34 weeks	7	16.67
35 weeks and above	2	
Severe anemia(6 gm % and less)	8	66.66
Unbooked cases	12	100.00
Education less than 8 standard	12	100.00
Non land owner	12	100.00
Caesarean delivery	7	58.33

Premature rupture of membranes	7	58.33
Abruptio placentae	3	25.00
Tobacco use	4	33.33

8 (66.66%) cases had severe PIH, 5(38.46%) cases of eclampsia 7 (58.33%) cases were of 28 to 30 weeks of gestation and 3(25.00%) were 31to 34 weeks of gestation. 2(16.66%)cases were 35 weeks and above. 8 (66.66%) cases were severely anaemic.12 (100,00%)were unbooked cases and had education less than eight standard. All cases were land less belonging to lower socio economic status. 4 (33.33%) cases were tobacco users.

Table 4: Clinical Presentation

Clinical Presentation	No of Patients	Percentage
Catastrophic/stroke unconscious/history of convulsions/neural deficit	10	83.33
hemiplegia	2	16.67
Breathlessness, cough	12	100.00
Generalized anasarca	12	100.00
Disorientation, agitation	12	100.00
Tachycardia, tachypnea	12	100.00
Diastolic Blood pressure more than100mm of hg	12	100.00
Positive auscultation	12	100.00
Positive X RAY	12	100.00
Low Oxygen saturation (below 90%)	5	41.66

5 (41.66%) cases were brought to hospital with eclampsia in catastrophic or unconscious state or with history of convulsions at home.12 (100.00%) cases presented with breathlessness cough, had tachycardia and tachypnea and positive X rays. All cases were dis-oriented or agitated, had diastolic BP more than 100 mm of HG, positive chest signs and low oxygen saturation.

Table 5: Timing of stroke and type of cerebrovascular accident

Timing of Stroke	Number of Patients	Percentage
Ante partum	5	41.66
Post partum, puerperal	7	58.33
Type of cerebrovascular accident		
Cerebral infarct	5	41.66
Intra cerebral hemorrhage	5	41.66
Cerebral venous thrombosis	2	16.67

7(58.33%) cases occurred post partum 5(41.66%) cases occurred in pregnancy. 5(41.66%) each was diagnosed as cerebral infarct and intra cerebral hemorrhage.

Table 6: Management

Treatment	No of Patients	Percentage
Standard thrombolytic and Anti-hypertensive Lobate and nefidipine, diuretic furosemide, oxygen by mask , induction of labor, and vaginal delivery	5	41.66
Resuscitation, mag-sulf therapy anti -hypertensives diuretics ventilator support, caesarean delivery	7	58.33
Termination of pregnancy	12	100.00
Normal vaginal	5	41.66
Caesarean section	7	58.33
Anti thrombotic drugs	2	16.67
Outcome of fetus		
Stillbirth	3	25.00
live birth	9	75.00
Maternal deaths	2	16.66

5 (41.66%) cases were managed by anti-hypertensives, diuretics, oxygenation and termination of pregnancy. 7(58.33%) cases required resuscitation ventilator support anti hypertensives, diuretics and 7 (58.33%) termination of pregnancy by caesarean delivery. outcome of fetus 3(23.08%) were still birth and 9 (75.00%) were live births of preterm and extremely preterm new born babies. 2 (16.66%) were maternal deaths.

Results

There were total 12 cases of cerebrovascular accidents in pregnancy and puerperium. Maximum

cases 8 (66.66%) were more than 26 years of age and 5 (41.66%) were more than 31 years of age. 9 (75.00%) cases were multipara, para three and above. 8 (66.66%) cases had severe PIH, 5(41.66%) cases of eclampsia. 7 (58.33%) cases were of 28 to 30 weeks of

gestation and 3(25.00%) were 31 to 34 weeks of gestation. 2(16.67%) cases were 35 weeks and above. 8 (66.66%) cases were severely anaemic. 12 (100, 00%) were unbooked cases and had education less than eight standard. All cases were landless belonging to lower socio economic status. 3 (25.00%) were tobacco users. 5 (41.66%) cases were brought to hospital with eclampsia in catastrophic or unconscious state or with history of convulsions at home. 12 (100.00%) cases presented with breathlessness cough, had tachycardia and tachypnea and positive X rays. All cases were disoriented or agitated, had diastolic BP more than 100 mm of HG, positive chest signs and low oxygen saturation. 7(58.33%) cases occurred post partum 5(41.66%) cases occurred in pregnancy. 5(41.66%) each were diagnosed as cerebral infarct and intra cerebral haemorrhage 5 (41.66%) cases were managed by thrombolytic drugs, anti-hypertensives, diuretics, oxygenation and termination of pregnancy. 7(58.33%) cases required resuscitation ventilator support anti hypertensives, diuretics and 7 (58.33%) termination of pregnancy by caesarean delivery. outcome of fetus 3(25.00%) were still birth and 9 (75.00%) were live births of preterm and extremely preterm new born babies. 2(16.66%) were maternal deaths.

Discussion

The incidence during pregnancy and puerperium was reported 4.3 non hemorrhagic strokes and 4.3 intracerebral hemorrhages per 100 000 deliveries [14]. stroke in nonpregnant women aged 15 to 44 years was reported as 10.7/100 000 women years [15]. There is a 13 times increased risk of stroke associated with pregnancy and more importantly post delivery up to six weeks [16]. Although venous thrombosis can be present in association with pregnancy, most infarctions are attributed to arterial occlusion [17]. It has been suggested that stroke in the postpartum period may be the indirect result of a large reduction in blood volume or secondary to hormonal changes [18]. Venous thrombosis may be secondary to physiological changes in coagulation associated with pregnancy or secondary to dehydration [19]. The most common identifiable causes of cerebral infarction are eclampsia and preeclampsia [20]. Other factors include cardiac emboli or paradoxical emboli (valvular heart disease, coronary artery disease, patent foramen ovale), coagulopathy (deficiencies of protein C, protein S, and antithrombin III and activated protein C resistance), and arterial dissection [21]. Maternal mortality following cerebral infarction has been reported in 0% to 25% of patients [22]. Pregnancy and the puerperium are considered

hypercoagulable states. Factors leading to hypercoagulability of blood include low levels of inhibitors of the coagulant protein S; elevated levels of inhibitors of protein C; increased levels of fibrinogen, factor VII, factor VIII, and factor X; and an enhanced ability to neutralize heparin [23]. cesarean delivery; fluid, electrolyte, and acid-base disorders; and hypertension, and infections are other associated causative factors [24]. Hypertensive disease of pregnancy affects approximately 15% of pregnant women [25]. The underlying mechanism for the hypertension in this disease state remains unknown. Urgent reduction of critically high blood pressure with an intravenous antihypertensive agent is necessary. Nitroglycerin (glyceryl trinitrate) is recommended as the drug of choice in pre-eclampsia associated with pulmonary edema [26]. It is given by intravenous infusion starting at 5 µg per min, gradually increasing every 3–5 min to a maximum of 100 µg per min. Nitroglycerin can also be administered by sublingual spray (400 µg, 1–2 puffs every 5–10 min). An alternative agent, sodium nitroprusside, is recommended in severe heart failure and critical hypertension; however, it should be used only with caution [27] Reduction in systolic and diastolic blood pressure should occur at a rate of approximately 30 mmHg over 3–5 min approximately to 140/90 mmHg. Intravenous furosemide (bolus 20–40 mg over 2 min) is used to promote vasodilation and diuresis, with repeated doses of 40–60 mg after approximately 30 min if there is an inadequate diuretic response (maximum dose 120 mg.) [28].

If hypertension persists despite the combination of nitroglycerin or sodium nitroprusside and furosemide, then a calcium channel antagonist such as nifedipine or nifedipine may be considered. Labetalol, Prazosin as well as hydralazine can be used for control of high blood pressure. Intravenous morphine 2–3 mg may also be given as a vasodilator and anxiolytic [29] in the present study women with 31 years and above were 41.66% and three or more parity was seen in 75% of cases. 66.66% cases had severe PIH, 38.46% cases of eclampsia there were 33.33% tobacco users. 58.33% cases were in post partum period and 41.66% were in the late antenatal period 66.66% cases were severely anaemic 100.00% were unbooked cases and had education less than eight standard. All cases were land less belonging to lower socio economic status. 33.33% cases were tobacco users. There was no history of any pre existing neurological disease. 58.33% cases were caesarean deliveries as compared to 41.66 normal deliveries. there were 25% perinatal deaths and 16.66 % maternal deaths. Thrombotic infarcts result from hypercoagulable states and thrombosis on top of

existing atherosclerotic plaques. Embolic infarcts can result from dissections due to prolonged difficult labor, cardiac valvular disease, and the rare dilated peripartum cardiomyopathy. In those conditions, infarctions typically occur in the major arterial distributions [30].

Conclusion

Cerebro vascular accidents in pregnancy and puerperium are rare but life threatening. Severe pregnancy induced hypertension, eclampsia, caesarean delivery, infections, and severe anaemia and tobacco use have been associated factors. Regular ante natal checkup and timely diagnosis and proper management will reduce maternal mortality and morbidity.

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