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Frequencies of different vascular etiologies and clinical presentations in post-partum women with suspected stroke

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Abstract:

Objectives:

To assess the frequencies of different vascular etiologies and clinical presentations in post-partum women with suspected stroke.

Materials and Methods: In this cross sectional study, we enrolled a total of 118 female in post-partum period of 30 days after delivery having clinical diagnosis of suspected stroke. Following an evaluation of each patient, the clinical presentation and frequency of various vascular aetiologies were recorded. The study duration was 6 month from February 2023 to July, 2023 and was conducted at Department of Medicine, Hayatabad Medical Complex, Peshawar.

Results: The mean age of all patients were 33.83±7.4 years. 10% of patients were suffering from Arterial thrombosis, 20% patients from cerebral venous sinus thrombosis and 70% patients were suffering from hemorrhagic stroke. Clinical presentation of all the enrolled patients were shown as 53.8%, 44.5%, 22.9% and 16.1% patients have symptoms of Headache, Seizures, Altered Consciousness and Weakness respectively. We have found 26.3%, 20.3%, 28.6% and 15.1% patients were suffering from hypertension, DM, proteinuria and anemia respectively. We have stratified arterial thrombosis, cerebral vein thrombosis, and hemorrhagic stroke according to many risk variables, including place of residence, hypertension, diabetes mellitus, proteinuria, and anaemia. All other factors have an insignificant P-value, with the exception of age group.

Conclusion: In postpartum women suspected of having had a stroke, headaches were the most prevalent clinical manifestation, while hemorrhagic strokes were the most common vascular etiology.

Key words: Arterial Thrombosis, Cerebral Venous Sinus Thrombosis, Postpartum, Stroke.

INTRODUCTION:

Stroke in postpartum women is a relatively rare but serious event.(1) The frequency of different vascular etiologies and clinical presentations can vary, but several factors contribute to the overall risk. Peripartum

(during childbirth) and the immediate postpartum period (after childbirth) are times when the risk of stroke appears to be higher in women.(2) The increased risk is likely influenced by various factors associated with pregnancy and childbirth.(3) These factors may include hormonal changes, changes in blood volume and flow, and other physiological shifts.

Cerebral Vein Thrombosis (CVT) is a condition where a blood clot forms in the veins that drain blood from the brain.(4) These veins are known as cerebral veins or sinuses.(5) CVT is a type of stroke, and it can lead to serious complications if not promptly diagnosed and treated.(6) About 0.5% to 1% of all strokes are caused by CVT.(7) CVT has been linked to several causes, although only a few of them are reversible. An elevated risk of stroke has been linked to conditions such as preeclampsia and gestational hypertension during pregnancy.(8) Women with infections at the time of delivery were more likely to have strokes, regardless of their hypertensive problems during pregnancy.(2) A retrospective study conducted in Japan focused on strokes associated with pregnancy and the postpartum period. The study revealed that 73.6% of cases involved hemorrhagic strokes, 18.4% exhibited arterial infarction, 6% presented venous infarction, and 2% experienced a mixed stroke involving both ischemic and hemorrhagic components.(9) By investigating the frequencies of different vascular etiologies and clinical presentations, the study aims to contribute valuable information that can impact clinical practice, patient care, and public health strategies in the context of post-partum stroke.

Objective:

To assess the frequencies of different vascular etiologies and clinical presentations in post-partum women with suspected stroke.

MATERIALS AND METHODS:

Study Design: cross-sectional study.

Study setting: Department of Medicine, Hayatabad Medical Complex, Peshawar, Pakistan.

Duration of the study: Duration of the study was 6 month (February 2023 to July, 2023).

Inclusion Criteria:

- Female who were within the first 30 days postpartum.
- Patients of age 18-45 years.
- Women with suspected stroke based on clinical symptoms.
- Women presenting with a range of clinical symptoms indicative of stroke (e.g., sudden onset of weakness, numbness, difficulty speaking).
- Women with diverse vascular etiologies contributing to stroke.

Exclusion Criteria:

- Women with a prior history of stroke.
- Those patients having a serum creatinine level equal to or exceeding 1.5 mg/dL.
- Women with multiple pregnancies to maintain homogeneity in the study population.

Methods:

This study took place Department of Medicine, Department of Medicine, Hayatabad Medical Complex, Peshawar, Pakistan. In the duration from February, 2023 to July, 2023. A total of 118 patients were enrolled. Complete physical and clinical examination of all the enrolled patients were done. A pre-design questionnaire was employed to gather the individual's biographical data, medical history, and previous prenatal records, followed by an analysis of other related medical documents.

The identification of a suspected stroke was based on the presence of any one of the following criteria: (i) a sudden onset of a neurological deficit lasting more than 24 hours. The neurological deficit could manifest as limb weakness, a positive Babinski's sign, or cranial nerve palsy. (ii) The occurrence of altered consciousness which was defined as a neurological examination revealing a Glasgow Coma Scale (GCS) score of 13 or less. Based on the reporting of MRI, MRV, and MRA, the categorization of Cerebral Venous Thrombosis (CVT) was established as either YES or NO. By evaluating the brain's CT scan, which identified an intracerebral haemorrhage as the presence of a hyperdense region inside the brain parenchyma, hemorrhagic stroke was classified as either YES or NO. A consultant radiologist with at least three years of post-fellowship experience prepared these reports. At the time of enrollment, information was gathered about maternal age, mode of delivery, place of delivery, anaemia, proteinuria, diabetes, hypertension, and anaemia. The researchers especially asked about the intensity of headaches, seizures, limb weakness, and altered awareness. On the initial day of hospital presentation, fasting blood sugar, random blood sugar, hemoglobin, serum creatinine, and urine examination for proteinuria were conducted. The Blood pressure were also noted. Two blood pressure readings, taken with a five-minute interval, were averaged and recorded in the proforma. The patient was diagnosed as hypertensive based on this averaged blood pressure value. The severity of headache pain was evaluated using a scale. The Glasgow Coma Scale (GCS) assessment and motor examination were conducted by the same consultant. Additionally, MRI, MRA, MRV, and CT brain scans were performed for each case and subsequently reported. A consultant radiologist reported MRI, MRV, and MRA data, and used that information to classify related arterial thrombosis as either YES or NO.

SPSS version 26 were used to analyse the data.

RESULTS:

Table 1:
Mean age of all enrolled Patient *(n=522)*

Variables	Mean±SD
Age (Years)	33.83±7.4

Table 2: Characteristics of all the enrolled patients *(n=118)*

	Frequency	Percentage
Mode of delivery		
Spontaneous vaginal delivery	60	57.6
Cesarean section	50	42.4
Place of living		
Rural	75	63.6
Urban	43	36.4
Hypertension	31	26.3
DM	24	20.3
Anemia	34	28.6
Proteinuria	18	15.1

Table 3: Clinical presentation of all the enrolled patients (*n=118)*

Clinical presentation	Frequency	Percentage
Headache	64	53.8
Seizures	53	44.5
Altered Consciousness	27	22.9
Weakness	19	16.1

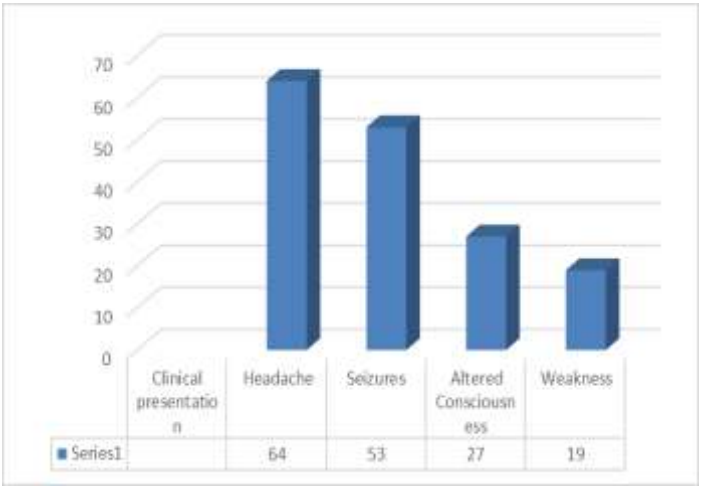

Fig 1: *Clinical presentation of all the enrolled patients*

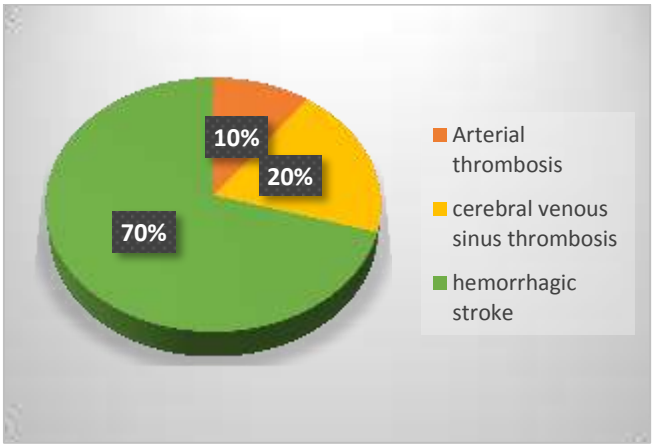

Fig 2: *Different vascular etiologies in post-partum women with suspected stroke.*

Table 4: Stratification of cerebral vein thrombosis with respect to age groups, mode of delivery, Place of living, hypertension, Diabetes, proteinuria and anemia *(n=118)*

Age groups	YES	NO	P-value
18-30 years	1(4.5%)	28(29.2%)	
31-40 years	12(54.5%)	53(55.2%)	0.007
41-45 years	9(40.9%)	15(15.6%)	
Mode of delivery			
SVD	12(54.5%)	56(58.3%)	
CS	10(45.5%)	40(41.7%)	0.74
Place of living			
Rural	14(63.6%)	61(63.5%)	
Urban	8(36.4%)	35(36.5%)	0.99
Diabetes mellitus	4(18.2%)	20(20.8%)	0.78
Hypertension	5(22.7%)	26(27.1%)	0.67
Proteinuria	3(13.6%)	15(15.6%)	0.81
Anemia	7(31.8%)	27(28.1%)	0.73

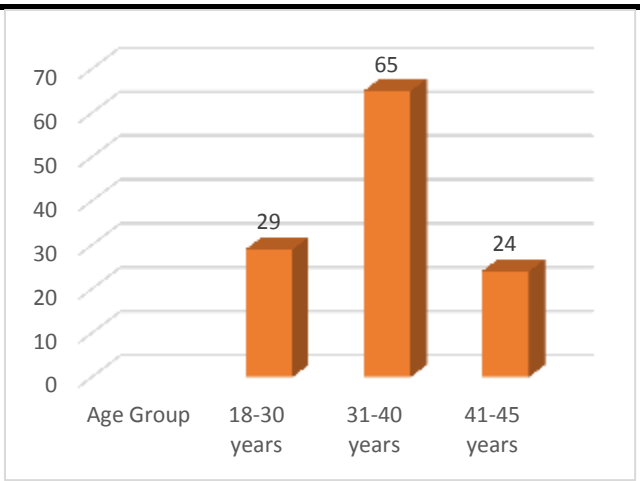

FIG 2: *Patients distribution on the basis of age groups*

Table 5: Stratification of arterial thrombosis with respect to age groups, mode of delivery, Place of living, hypertension, Diabetes, proteinuria and anemia *(n=118)*

Age groups	YES	NO	P-value
18-30 years	3(25.0%)	26(24.5%)	
31-40 years	4(33.3%)	61(57.5%)	0.12
41-45 years	5(41.7%)	19(17.9%)	
Mode of delivery			
SVD	7(58.3%)	61(57.5%)	
CS	5(41.7%)	45(42.5%)	0.95
Place of living			
Rural	8(66.7%)	67(63.2%)	

Urban	4(33.3%)	39(36.8%)	0.81
Diabetes mellitus	3(25.0%)	21(19.8%)	0.67
Hypertension	4(33.3%)	27(25.5%)	0.55
Proteinuria	2(16.7%)	16(15.1%)	0.88
Anemia	3(25.0%)	31(29.2%)	0.75

Table 6: Stratification of hemorrhagic stroke with respect to age groups, mode of delivery, Place of living, hypertension, Diabetes, proteinuria and anemia *(n=118)*

Age groups	YES	NO	P-value
18-30 years	25(30.1%)	4(11.4%)	0.001
31-40 years	48(57.8%)	17(48.6%)	
41-45 years	10(12.0%)	14(40.0%)	
Mode of delivery			
SVD	48(57.8%)	20(57.1%)	0.94
CS	35(42.2%)	15(42.9%)	
Place of living			
Rural	52(62.7%)	23(65.7%)	0.75
Urban	31(37.3%)	12(34.3%)	
Diabetes mellitus	16(19.3%)	8(22.9%)	0.65
Hypertension	21(25.3%)	10(28.6%)	0.71
Proteinuria	12(14.5%)	6(17.1%)	0.71
Anemia	23(27.7%)	11(31.4%)	0.68

Discussion:

Stroke is a prevalent condition among expectant mothers. Just 2% of all pregnancy-related strokes result in cerebral venous thrombosis. Women are most at risk for CVT during the third trimester and the postpartum period, which is also when venous thromboembolic events are most likely to occur.

The aim of the present study was to assess the frequencies of different vascular etiologies and clinical presentations in post-partum women with suspected stroke. So we find in this study 10% arterial thrombosis, 20% cerebral vein thrombosis and 70% hemorrhagic stroke. Our study finding was supported by the study finding of Farid ud Din et al.(10) in which they found cerebral venous sinus thrombosis in 17.9%, arterial thrombosis 6.0% and hemorrhagic stroke in 76.1% patients. The recent publications have undertaken in-depth reviews of cerebral venous thrombosis (CVT) and thrombophilias to assess their causes and risk factors. This suggests an increased focus on understanding the underlying factors and potential risks associated with CVT and thrombophilias in the scientific literature.(11)

Age is a significant factor in the development and progression of many vascular-related conditions. The mean age of all enrolled patients in the present study was 33.83±7.4. The vascular conditions are more prevalent in older age, lifestyle factors, genetics, and overall health also play significant roles in their development. Maintaining a healthy lifestyle, including regular exercise, a balanced diet, and avoiding tobacco use, can help reduce the risk of vascular-related issues at any age. Our study age was resemble by another study. (10)

There are a number of risk factors such as Diabetes mellitus, hypertension, proteinuria and anemia. We have found 26.3%, 20.3%, 28.6% and 15.1% patients were suffering from hypertension, DM, proteinuria and

anemia. Hypertension, diabetes mellitus (DM), proteinuria, and anemia are indeed considered risk factors for various vascular etiologies.[12-14] Each of these conditions can contribute to the development and progression of vascular-related issues.[15, 16] In the present study we have stratified arterial thrombosis, cerebral vein thrombosis and hemorrhagic stroke with respect to different risk factors such as place of living, hypertension, DM, proteinuria and anemia. Except age group all the other factors have insignificant P-value. During pregnancy, hypertension may develop gestationally, result from pre-existing disorders, or be linked to eclampsia or preeclampsia. Compared to women without high blood pressure, pregnant women with hypertension have a 6–9 times increased risk of stroke. Certain complications during pregnancy, labor, and delivery can potentially increase the risk of stroke in women.(17, 18) Anemia, or a low red blood cell count, can reduce the oxygen-carrying capacity of the blood. In severe cases, inadequate oxygen delivery to the brain may increase the risk of stroke.(19)

Conclusion: It was concluded that in postpartum women suspected of having had a stroke, headaches were the most prevalent clinical manifestation, while hemorrhagic strokes were the most common vascular etiology. Early recognition and prompt management of conditions such as postpartum stroke are crucial for reducing both mortality and morbidity. We recommend further studies to understand it better.

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