ORIGINAL RESEARCH

To Determine the Epidemiological Factors of Venous System Thrombosis in Southern Rajasthan

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ABSTRACT

Background: Venous thrombosis is a major health problem. It is predominantly a disease of older age. The study was conducted to determine the epidemiological factors of venous system thrombosis in southern Rajasthan. **Material & Methods:** The prospective observational cohort study design adopted the epidemiological factors of venous system thrombosis in southern Rajasthan. The study was conducted among 100 patients. Various invasive and noninvasive radiological investigations and hematological investigations were done. The patients were followed up till the time of discharge and hospital outcomes. **Results:** Among male most patients were from 31-50 years age group and among females most of them from 18-30 years age group. Mean age was 24 years. Male predominance for venous thrombosis was found in the study and 66% patients were males and 34% patients were females. Male to female ratio was 2:1. Of the 100 patients enrolled in study there was 1 case of subclavian vein thrombosis and 3 cases of superior venacava thrombosis. Rest maximum cases were either DVT or CVST. None of the patients presented with IVC thrombosis. All of them underwent all investigations as per protocol and also there was no mortality. In our study, maximum cases were DVT i.e. 50% followed by CVST i.e. 30% followed by PVT and SVT. Among males' maximum patients had DVT I.E. 50% among females maximum patients had CVST i.e. 30%. **Conclusion:** The present study concluded that Venous System Thrombosis found mostly among male patients of age group 31-50 years and among females most of them from 18-30 years age group. Male to female ratio was 2:1. Maximum cases were DVT i.e. 50% followed by CVST i.e. 30% followed by PVT and SVT. Among males maximum patients had DVT i.e. 50% and among females maximum patients had CVST i.e. 30%.

Keywords: Venous System Thrombosis, Male to Female Ratio, CVST.

INTRODUCTION

Veins are present throughout the body as tubes that carry blood back to the heart. Veins are classified in a number of ways, including superficial vs. deep, pulmonary vs. systemic, and large vs. small.[1] Veins are translucent, so the color a vein appears from an organism's exterior is determined in large part by the color of venous blood, which is usually dark red as a result of its low oxygen content. Veins appear blue because the subcutaneous fat absorbs low-frequency light, permitting only the highly energetic blue wavelengths to penetrate through to the dark vein and reflect back to the viewer. The colour of a vein can be affected by the characteristics of a person's skin, how much oxygen is being carried in the blood, and how big and deep the vessels are.[2]Virchow's triad predicts that the causes of thrombosis are changes in blood coaguability, changes in the vessel wall or stasis. More recent studies have provided a mechanistic understanding for some of the processes that cause each of these alterations to contribute to thrombosis. A combination of genetically manipulated mouse models and human epidemiology have revealed that a variety of genetic risk factors can contribute to venous thrombosis, but the site of the thrombotic risk varies depending on the defect.[1,2]One of the major concepts involved in either hemostasis or thrombosis is that the processes are localized. Simply increasing coagulation enzyme concentrations with or without added negatively charged phospholipid vesicles leads to thrombin generation, but this thrombin generation is widespread, usually leading to disseminated intravascular coagulation rather than either hemostasis or thrombosis.[3,4]Venous thrombosis, comprising deep

vein thrombosis (DVT) and pulmonary embolism (PE), occurs with an incidence of approximately 1 per 1000 annually in adult populations.[5]Increased levels of coagulation factors, particularly factor VIII, von Willebrand factor, factor VII and prothrombin are associated with an increased risk of thrombosis.[2,6]The study was conducted to determine the epidemiological factors of venous system thrombosis in southern Rajasthan.

MATERIALS & METHODS

The prospective observational cohort study design was adopted to determine the epidemiological factors of venous system thrombosis in southern Rajasthan. The study was conducted in the department of general medicine at RNT Medical College, Udaipur. The protocol was submitted before the initiation of study and was approved by theInstitutional Review Board and Ethics Committee. Informed consent was obtained from all the participants prior to their entry into the study. The study was conducted among 100 patients admitted and diagnosed with venous system thrombosis. Patients admitted and diagnosed with venous system thrombosis with age >18 years, pulmonary vein thrombosis, deep venous thrombosis, cerebral venous thrombosis, venous sinus thrombosis, superior vena cava thrombosis, inferior vena cava thrombosis, Portal vein thrombosis were included in the study. Alcoholics, trauma, superficial thrombophlebitis, patient/caregiver refusing consent for entering the study, patient already on therapeutic anticoagulation, e.g.: prosthetic heart valves, stroke hemorrhagic, arterial infarction, Eclampsia were excluded from the study.

DATA COLLECTION

All the variables of interest were collected through a data abstraction form which was duly filled by the principal investigator (self) on day 1 of admission. The predictor variables related to treatment and outcomes were filled, just prior to the patient exiting the study. All the variables used in the data abstraction form were clearly defined prior to starting the study, to avoid discrepancies and ambiguity. Various invasive and noninvasive radiological investigations and hematological investigations were done according to patients profile, signs and symptoms. This was done by principal investigator (self).The patients were followed up till the time of discharge and hospital outcomes. The primary outcome of the study was to be able to delineate and determine the epidemiological factors of venous system thrombosis in southern Rajasthan.

STATISTICAL METHODS

Analysis was done using SPSS version 16 (Copyright 2007). Data was entered in EPIDATA software with quality control checks such as range and consistency. Data quality was further explored using histogram, Box Cox plots and frequency distributions (which was used for continuous variables). Categorical variables have been presented as numbers and percentages and continuous variables as mean and standard deviation (SD). Logistic regression analysis was done to determine the risk factors Venous thrombosis with log link. Model assumptions were checked using likelihood residual plots against predicted probability. Goodness of fit of the model was assessed using Hosmer Lemeshow chi-square statistics.

RESULTS

Among male most patients were from 31-50 years age group and among females most of them from 18-30 years age group. The mean age was 24 years.

Male predominance for venous thrombosis was found in the study and 66% patients were males and 34% patients were females. Male to female ratio was 2:1.

Of the 100 patients enrolled in the study there was 1 case of subclavian vein thrombosis and 3 cases of superior venacava thrombosis. Rest maximum cases were either DVT or CVST.

None of the patients were presented with IVC thrombosis.

All of them underwent all investigations as per protocol and also there was no mortality.

In our study, the maximum cases were DVT i.e. 50% followed by CVST i.e. 30% followed by PVT and SVT.

Among males' maximum patients had DVT I.E. 50% among females maximum patients had CVST i.e. 30%.

Table 1: Correlation of age and gender with Venous Thrombosis

Age (yrs)	Male	Female	%
18-20	3	6	9
20-30	16	11	27
30-40	20	8	28
40-50	15	6	21
50-60	8	3	11
>60	4	0	4
Total	66	34	100

Table 2: Different anatomical sites of venous thrombosis and correlation with age group

Age (yrs)	CVST	DVT	PTE	DVT+PTE	Subclavian vein thrombosis	SVT	PVT
18-20	7	1	0	1	0	0	0

20-30	14	6	2	1	0	1	3
30-40	8	17	0	0	0	0	3
40-50	0	15	0	3	0	2	2
50-60	1	7	0	1	1	0	1
>60	0	4	0	0	0	0	0
Total	30	50	2	6	1	3	0

Table 3: Correlation of gender with Venous thrombosis (n=100)

Gender	CVST	DVT	PTE	DVT+PTE	Subclavian vein thrombosis	SVT	PVT
Male	14	40	0	3	1	2	6
Female	16	10	2	3	0	1	2
Total	30	50	2	6	1	3	8

DISCUSSION

Among male most patients were from 31-50 years age group and among females most of them from 18-30 years age group. The mean age was 24 years. Male predominance for venous thrombosis was found in the study and 66% patients were males and 34% patients were females. Male to female ratio was 2:1. Of the 100 patients enrolled in the study there was 1 case of subclavian vein thrombosis and 3 cases of superior venacava thrombosis. Rest maximum cases were either DVT or CVST. None of the patients were presented with IVC thrombosis. All of them underwent all investigations as per protocol and also there was no mortality. In our study, the maximum cases were DVT i.e. 50% followed by CVST i.e. 30% followed by PVT and SVT. Among males' maximum patients had DVT I.E. 50% among females maximum patients had CVST i.e. 30%.

A study by White RH[5], the epidemiology of venous thromboembolism stated that venous thrombosis, comprising deep vein thrombosis (DVT) and pulmonary embolism (PE), occurs with an incidence of approximately 1 per 1000 annually in adult populations and are slightly higher in men than women, similarly our study also identifies 50% cases of DVT in study population, among which 80% patients were male and 20% patients were females.

A study by Silverstein M et al[7]stated that venous thrombosis is a disease of aging, with a low rate of about 1 per 10,000 annually before the fourth decade of life, rising rapidly after age 45 years and approaching 5-6 per 1000 annually by 80. Contrary to these patients mean age in our study population was 40 years which shows that risk factors such as diabetes and hypertension are becoming more prevalent in younger population and thus mean age is less compared to other studies.

White R et al[8], stated that differences in incidence of diagnosed venous thrombosis among ethnic groups with rates lower in the United States, in Asians, Pacific Islanders and Hispanics than in whites, and with some studies reporting an approximate 25% higher rate in African-Americans, contrary to this our study shows that there were many cases of DVT(50%) and CVST(30%) in our study population alone, thus the myth that Asians are immune to venous thrombosis can now be challenged.

CONCLUSION

The present study concluded that Venous System Thrombosis found mostly among male patients of age group 31-50 years and among females most of them from 18-30 years age group. Male to female ratio was 2:1. Maximum cases were DVT i.e. 50% followed by CVST i.e. 30% followed by PVT and SVT. Among males' maximum patients had DVT i.e. 50% and among females maximum patients had CVST i.e. 30%.

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