Journal of Cardiovascular Disease Research

ISSN: 0975-3583,0976-2833 VOL13, ISSUE 08, 2022

A Cross Sectional Study to Detect the Prevalence of Hyperhomocysteinemiain Cases Admitted With Deep Vein Thrombosis in Shri Dharmasthala Manjunatheshwara Hospital Dharwad

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Received: 09November 2022 Revised: 05December 2022 Accepted: 17December 2022

ABSTRACT

Background: Hyperhomocysteinemia is a known risk factor for the development of deep vein thrombosis (DVT). Various studies have been conducted in the western countries to know the prevalence of hyperhomocysteinemia in patients with DVT and in general population. There is no documented literature of the prevalence of hyperhomocysteinemia in Indian population.
Objective: To evaluate the Prevalence of Hyperhomocysteinemia in patients admitted with Deep Vein Thrombosis in SDM Hospital, Dharwad.
Material and Methods:A prospective cross sectional study done on a total of 100 patients admitted in SDM Hospital, Dharwad. DVT was confirmed by Doppler examination. Serum homocysteine was measured and the data analysed. Statistical significance was calculated using Chi Square test.
Results:A total of 100 patients were studied of which 81 were males and 19 were females. The prevalence of hyperhomocysteinemia among the cases of DVT in our population was 40%.The prevalence among males was 36.84% and among females was 40.74%.
Conclusion: The prevalence of hyperhomocysteinemia in cases of deep vein thrombosis in our population was 40%. There was a no statistically significant association between hyperhomocysteinemia and ischaemic heart disease or smoking in our study.
Keywords: Deep vein thrombosis, Hyperhomocystenemia, Prevelance.

INTRODUCTION

One of the most important problems in the diseases of the peripheral veins is concerned with intraluminal clotting. In 1929, Dencke pointed out that soft friable thrombi could develop in the veins of the calf and the foot purely as a result of stasis. Oschner and Debakey distinguished thrombophlebitis (inflammatory) from phlebothrombosis(non-inflammatory).
Phlebothrombosis is a disease which remains symptom free till complications like pulmonary embolism becomes obvious. It was considered that the efficient return of blood from the veins of the extremities depends on six factors:

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The disturbance of any one or a combination of these factors may result in sufficient stasis to produce phlebothrombosis. Phlebothrombosis of deep veins is clinically silent and manifests only as its complications.

Early recognition of the process of venous phlebothrombosis, its pathophysiology and availability of Doppler study has remarkably reduced the incidence of Pulmonary emboli and its consequences by instituting early management.

Deep vein thrombosis (DVT) is a preventable condition that causes significant morbidity and mortality. Statistics show that complications from DVT kills more people than breast cancer and AIDS combined Some of the contributing factors for DVT in adults are cancer, old age, prolonged period of immobilization, paralysis or stroke, previous history of venous thromboembolism,congestive cardiac failure, pregnancy or puerperium, hormonal treatment, dehydration, varicose veins, long air travel, inflammatory bowel disease, rheumatoid disease and nephrotic syndrome.

Even though there is so much of information in the surgical community regarding DVT and its dreaded complications, information as to when to start prophylaxis is always a matter of debate.

Current contraindications against initiation of prophylaxis against DVT (with low molecular weight heparin (LMWH)) include intracranial bleed, internal bleeding from the raw wounds and operated sites bleed, spinal bleeding following spinal anesthesia and spinal injury due to hematoma.

An association between the risk of venous thromboembolism and a hypercoagulable state has been recognized for many years. Mild hyperhomocysteinemia is an established risk factor for atherosclerosis and vascular disease.[1,2] In classic homocysteinuria, half the vascular complications are of venous origin.[3] Various studies have proven that hyperhomocysteinemia is a risk factor for venous thrombosis.[4,5] Prevalence of hyperhomocysteinemia in cases of deep vein thrombosis has been extensively studied in the western population, but there are very few studies showing its prevalence in Indian population.

Thus, the present study was undertaken with the aim to determine the prevalence of Hyperhomocysteinemia in cases of Deep Vein Thrombosis in SDM Medical College Dharwad.

MATERIAL &METHODS

This cross sectional study was conducted on patients admitted under Surgery Department in Shri DharmasthalaManjunatheshwara Hospital, Dharwadwith Deep Vein Thrombosis confirmed by Doppler ultrasound. Duration of study from November 2019 to October 2020.

Inclusion Criteria

All patients irrespective of age, sex, operative status admitted under surgery department in Shri DharmasthalaManjunatheshwara Hospital, Dharwadwith Deep Vein Thrombosis confirmed by Doppler ultrasound.

Sample: Sample size were 100.

The participants were included in the study after obtaining their written informed consent. Details of the patient like name, age, sex, in patient number, history of smoking, Diabetes Mellitus (DM), Ischaemic heart disease(IHD),Hypertension(HTN) were recorded in the proforma.

2 cc of overnight fasting venous blood sample was collected in EDTA bulb from the cubital vein and sent for serum homocysteine estimation to the biochemistry laboratory.

The ELISA method was used for the estimation of serum homocysteine levels. Hyperhomocysteinemia was defined as a serum homocysteine level of more than 22.0

ISSN: 0975-3583,0976-2833 VOL13, ISSUE 08, 2022

micromol/l in male patients and a serum homocysteine level of more than 18.0 micromol/l in female patients.

Data was collected using questionnaire method and entered in the proforma.

Study Analysis

The prevalence of hyperhomocysteinemia in patients with Deep Vein Thrombosis confirmed by Doppler ultrasound was analysed using data entered in SSPS software using pie chart

In every step of the study patient safety was given topmost preference. All procedures were done under strict aseptic precautions and only necessary investigations were carried out after carefully evaluating the patient.

Any procedure was done only after getting consent of the patient or the attender.

RESULTS

The average age of patients with DVT was 42 years. Maximum DVT cases were noted in age group of 31 to 40 years with 26 patients. Higher incidence of Hyperhomocysteinemia was seen in age group of 41 to 50 years with 12 patients.

Table1: Age distribution

Age	Normal	HYPERHOMOCYSTEINEMIA	Total
11--20	1	1	2
21--30	13	10	23
31--40	17	9	26
41--50	10	12	22
51--60	9	5	14
61--70	6	3	9
71--80	4	0	4
Total	60	40	100

The chi-square statistic is 5.393. The p-value is 0.494. Not significant

On taking into account the sex distribution of cases of deep vein thrombosis,it can be seen that the number of DVT cases are much higher in men in our hospital. 7 out of the total of 19 females with DVT had Hyperhomocysteinemia. 33 out of 81 males with DVT had Hyperhomocysteinemia.

Table2: Sex distribution

Sex	Normal	HYPERHOMOCYSTEINEMIA	Total
F	12	7	19
M	48	33	81
Total	60	40	100

The chi-square statistic is 0.097. The p-value is 0.755. Not significant

On analyzing the associated co morbidities in the study group, hypertension was the most significant contributing factor associated with DVT. Other co morbid conditions and risk factors in descending order were Diabetes Mellitus, Smoking and IHD.

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Table3: Co-morbidconditionsandriskfactors

RiskFactors		Normal	HYPERHOMOCYSTEINEMIA	Chi-Square Value	p-Value
Smoking	No	48	29	0.762	0. 383
	Yes	12	11		
DM	No	45	30	0	1
	Yes	15	10		
IHD	No	54	35	0.153	0.695
	Yes	6	5		
HTN	No	37	23	0.174	0.677
	Yes	23	17		

Table 4: Co-morbid conditions and risk factors

RiskFactors	HYPERHOMOCYSTEINEMIA
Smoking	**28%**
DM	25%
IHD	13%
HTN	43%

DISCUSSION

Deep vein thrombosis is a condition which occurs in any location within the venous circulation. Majority of deep venous thrombi are known to occur within the deep veins of the leg, followed by the pelvis.

Hyperhomocysteinemia is a proven risk factor for deep vein thrombosis. A study by Den HeijerM[6] showed a prevalence of Hyperhomocysteinemia as 10%. Simioni et al.[7] in their case control study showed that the prevalence of Hyperhomocysteinemia was 25%. In our study the prevalence of Hyperhomocysteinemia in patients with DVT was found to be 40%. Thus our study shows that the prevalence of Hyperhomocysteinemia in patients with DVT is higher in our Indian population as compared to Western population. Study done in New Zealand by MaelenTagelagi[8]and co-workers showed predominance of DVT in females,62%.(37)

In our study, out of the proven cases of DVT there was a male predominance of cases in a ratio of 4.2:1. Out of the total number of cases 81% were male and the remaining 19% were female. The average age for male DVT cases in our study group was 42 years. Falcon et al. found that Hyperhomocysteinemia was a risk factor for thrombosis in people younger than 40 years of age.

Hyperhomocysteinemia is a risk factor for recurrent venous thrombosis in patients between 20 and 70 years of age, as compared with controls from the general population.

In our study there was no statistical significance in the prevalence of Hyperhomocysteinemia among the different age groups.

In our study the sex wise prevalence of hyperhomocysteinemia was 40.74% in males as compared to 36.84% in females. Thus the prevalence was higher in males as compared to females. This is consistent with finding in other studies.

In the distribution of risk factors in the two groups no significant association was found b/w risk factors and Hyperhomocysteinemia. Hyperhomocysteinemia is associated with arterial thrombosisand is an established risk factor for atherosclerosis and vascular disease. The association between mild Hyperhomocysteinemia and venous thrombosis is similar in degree to that reported for Hyperhomocysteinemia and arterial vascular disease. But in our study,

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there was no statistically significant association between Hyperhomocysteinemia and arterial vascular disease.

There is also evidence in literature as written by Victor et al[9]supporting that smoking also creates a procoagulant state by increasing platelet activation, decreasing fibrinolysis and various other mechanisms which puts smoking as a very high risk factor for DVT. But in our study there was no association between smoking and DVT.

CONCLUSION

To sum up we can conclude that the Hyperhomocystenemiais indeed an established risk factor for deep venous thrombosis and early treatment of Hyperhomocysteinemia can help in preventing recurrent DVT. Blood concentrations of Homocysteine are inversely related to blood concentrations of folate, vitamin B-12, and, to a lesser extent, vitamin B-6. Dietary supplements of these vitamins are used to reduce Homocysteine concentrations in subjects who have high blood concentrations of Homocysteine. In subjects with Hyperhomocysteinemia a reduction of plasma fasting Homocysteine concentration by folic acid and vitamins B12 and B6 administration is associated with reduction of thrombin generation both in peripheral blood and at sites of haemostatic plug formation.

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