



## PROFILE OF THROMBOSIS IN YOUNG ADULTS- A PHYSICIAN'S PERSPECTIVE FROM A PERIPHERAL HOSPITAL

### KEYWORDS

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### ABSTRACT

**Aim:** The aim of the study is to study the profile and outcomes of thrombosis and its complications in a peripheral hospital managed by a physician.

**Background:** Thrombotic complications whether arterial or venous per se are uncommon in younger age group, and limited knowledge is available in literature about spectrum of these complications in remote areas being managed by a physician.

**Material and methods:** All the patients below 60 years and males who were admitted in the hospital from Jan 2011 to Jun 2013 with either an arterial or venous thrombosis were included in the study.

**Results:** A total of 277 patients had thrombotic complications out of which 76 had venous thrombosis, 157 had coronary syndromes and 42 had thrombotic stroke and 02 patients had acute limb ischaemia. The average age of venous thrombosis, coronary syndromes and stroke were  $32 \pm 3.5$ ,  $38 \pm 2.6$  and  $41 \pm 2.8$  years respectively. In the venous thrombosis group deep vein thrombosis (DVT) occurred in 65/76(85%), 4/76 (5%) sustained pulmonary embolism, 3/76 patients (4%) mesenteric vein thrombosis and 04/76(5%) patients had cerebral venous thrombosis. In arterial thrombosis group coronary syndrome constituted 157/201(78%), ischaemic stroke 42/201(21%) patients and 02 patients had acute limb ischaemia. Out of coronary syndromes 59/157 (37.5%) patients sustained ST elevation myocardial infarction, 96/157 (61%) presented with unstable angina/ angina pectoris and 2/157(1%) patients had Prinzmetal angina. Mortality rates in coronary syndrome and stroke were 2.1% and 4.7% respectively and none in venous thrombosis group.

**Conclusion:** Thrombosis is known to occur in younger age groups and may lead to serious disabilities and loss of productive life. Effective and timely management of thrombosis and its complications by a physician even in peripheral hospitals leads to results as comparable to other settings and prevention of disabilities. It is essential for the young physicians who are working in the periphery to be familiar with the thrombosis and its varied presentations.

### Introduction

India is a country with predominant rural population and access to medical care is primarily on peripheral hospitals with limited infrastructure. Thrombosis and its complications are not uncommon and it is affecting both young and old.<sup>[1]</sup> The basic pathophysiology of thrombus in arterial and venous system may differ in mechanism but the effects remains the same, i.e. obstruction of vascular lumen leading to various manifestations. The difference between the arterial and venous thrombosis is the frequency with which it occurs. There is paucity of literature on profile and outcomes of thrombotic events in peripheral hospitals.<sup>[2]</sup> In this study we present the spectrum of thrombotic events in a remote hospital which were diagnosed and successfully managed.

### Material and methods

This study was carried out in a peripheral hospital in northern region of the country from Jan 2011 to Jun 2013. In addition to clinical data, smoking habits and past or family history of thrombotic complications was sought in all the patients. It was an observational cross sectional study where all the patients who were admitted in the hospital with thrombosis were included. All the cases were managed by physician.

The diagnosis of deep vein thrombosis (DVT) was made in patients with a suggestive clinical picture, and confirmed by doppler ultrasound study. Pulmonary thromboembolism was diagnosed on the basis of suggestive clinical picture, electrocardiogram (ECG) findings and computerized tomography (CT) of pulmonary vessels. The diagnosis of coronary syndrome was based on suggestive history, ECG finding and cardiac enzyme markers. The diagnosis of stroke

was made on the basis of clinical features, Computerized tomographic scan (CT) imaging findings. Apart from specific tests to diagnose the vascular event, a standard protocol of investigations was carried out to determine the cause of thrombosis, which included haemogram, peripheral smear, platelet count, prothrombin time, partial thromboplastin time with Kaolin and lipid profile. Procoagulant workup was not done.

### Inclusion criteria:

- (i) Radiologically confirmed thrombosis
- (ii) Age > 18 yrs and < 60 yrs
- (iii) Admitted in hospital > 48h

### Exclusion criteria:

- (i) Not consented
- (ii) Second episode of thrombosis

### Results

During the study period a total of 277 patients had thrombotic complications. Out of them 201/277(72.5%) had arterial thrombosis and 76/277(27%) had venous thrombosis. Of the arterial thrombotic events 157 had coronary events, 42 had stroke and 02 had acute limb ischaemia. In the venous thrombosis group DVT occurred in 65 patients, pulmonary thrombosis in 04 patients cerebral venous thrombosis in 04 patients and mesenteric venous thrombosis in 03 patients. The details are given in Table 1. The average age of the patients in venous thrombosis was  $32 \pm 3.5$  yrs,  $38 \pm 2.6$  yrs in the coronary artery group and  $41 \pm 2.8$  yrs in the stroke group respectively.

There were 157 cases of coronary syndromes [59 patients (38%) had

ST elevation myocardial infarction (STEMI), 96(62%) had unstable/stable angina and 02 cases of Prinzmetal angina]. In patients with STEMI 52/59(88%) were thrombolysed with Inj Streptokinase and rest were either out of window period or had silent myocardial infarction. The unstable angina cases were managed with low molecular weight heparin (Inj Enoxaparin) based on weight and other anti angina measures. 02 patients had Prinzmetal angina. There were 03 deaths (5%) in STEMI group. The percentage of Tobacco consumption, hypertension and diabetes mellitus in this group were 14%, 10% and 5% respectively. In coronary events group the average age was 38 yrs with youngest being the 22 yr old. Detailed clinical profile is given in table. Two patients had Prinzmetal angina as evidenced by ST segment elevation at the onset which got reversed by administration of nitrate without elevation of cardiac enzymes. There were three deaths, all of them due to cardiogenic shock within seven days. Ischaemic stroke occurred in 42/201(21%) patients of arterial thrombosis. The demographic profile and co morbidities were given in table. Stroke in young constituted 23/42(54%) of cases. Thrombolysis was done in 02(0.5%) patients. There were 02(5%) deaths in stroke group. Two patients had acute limb ischaemia in upper limb for which were referred for urgent vascular intervention which is difficult in peripheral set up.

In the venous thrombosis group, DVT involving predominantly lower limbs occurred in 65/76(85%) of cases, pulmonary thromboembolism(PTE) was seen in 4/76(5%) of patients. One patient had bilateral PTE. Mesenteric vein thrombosis occurred in 3/76(4%) patients. All of them presented with acute abdomen. Cerebral venous thrombosis (CVT) occurred in 4/76(5%) patients. All of them presented with headache and one patient seizure. No mortality occurred in CVT patients. Two patients had history of exposure to high altitude.

## Discussion

Thrombosis can be broadly categorized into venous and arterial thrombosis. Arterial thrombosis manifests itself mainly as myocardial infarction or cerebral infarction while venous thrombosis presents as DVT, pulmonary embolism, mesenteric or renal vein thrombosis.<sup>[1,2,3]</sup> Each of them occurs with an incidence of 1-3 per thousand population per year.<sup>[1]</sup> Virchow's triad is traditionally invoked to explain pathophysiologic mechanisms leading to development of arterial and venous thrombosis, consisting of hypercoagulability, vessel wall components, and blood flow.<sup>[4]</sup>

We had 76 cases of venous thrombosis in our study. The average age in our study was 32 yrs which was comparable to the study done by Cheena Garg et.al.<sup>[5]</sup> all of the patients were managed with Inj LMWH (Enoxaparin) followed by oral anticoagulation with warfarin. We couldn't test prothrombotic state in these patients but were advised to take tab warfarin for at least three months and were referred to higher center for procoagulant workup. In our study tobacco consumption was seen in 13/76(17%) in venous thrombosis group. While Holst et.al[6] reported obesity and smoking were associated with venous thromboembolism. In our study none of them had deranged lipid profile or diabetes mellitus in venous thrombosis group which may be due to younger population in our study.

Atherosclerosis is the chief cause of stroke and coronary syndromes but it is much less common in young individuals. Although the prevalence of these diseases is increasing and so are the risk factors.<sup>[7]</sup> In our study 38% had STEMI in contrast to other studies.<sup>[8,9]</sup> in our study all the patients were males as in other studies most of them were males.<sup>[10]</sup> In our study, most of the patients who had STEMI were thrombolysed with Inj Streptokinase, because of early recognition. In two cases, we had Prinzmetal angina which may be due to coronary spasm that was relieved promptly by administration of nitrates by the primary care medical professionals. In our study, unstable angina/ angina was seen in 96/157(63%) of the patients with coronary artery disease. In our study tobacco smoking was seen only in 4(10%) of patients in contrast to study by Rajni S<sup>[8]</sup> who had shown

higher percentage of smoking. In our study mortality rate was 5% in contrast to study by Xavier et.al<sup>[11]</sup> who have shown higher mortality of 8.6% which may be due to relatively younger population in our study. So in remote areas thrombolysis by drugs when there is no availability of PCI is also equally effective.

Stroke constitutes one of the important causes of premature death in India.<sup>[12]</sup> Stroke in young constituted 23/42(54%) which is much higher than that reported in literature. Dash D et .al<sup>[13]</sup> described various diseases including Rheumatic Heart Disease and Vasculitidis as important causes of stroke in young. However in our study none of the arterial thrombosis had Rheumatic Heart Disease or Vasculitidis. In contrast to study by Shah et al<sup>[14]</sup>, who reported high incidence of hemorrhagic stroke in the similar terrain. In our study we thrombolysed only two cases (0.5%) in contrast to study by Pandian et al.<sup>[15]</sup> Who showed higher rate of thrombolysis which may be due to better facilities and accessibility to medical care. In our study smoking was seen only in 10% of patients similar to study by Chaudhary et.al.<sup>[16,17]</sup> Cerebral venous thrombosis occurred in 4 patients constituting(5%) of all strokes which is much less in contrast to study by Banerjee et.al (18) who showed higher percentage which may be due to all male patients in our study. There were two case of acute limb ischaemia which was recognized early and was managed by surgeons.

## Conclusion

Thrombosis is not uncommon in young individuals and its sequelae may lead to long term morbidity and loss of productive life. Effective and timely management of even in the peripheral hospitals with limited resources may yield satisfying results. It is essential for the young physicians who are working in remote areas to be familiar with thrombosis and its varied presentations.

Table: Clinical profile of thrombosis

| <b>Venous thrombosis(n=76)</b>   |           |
|--|-----------|
| DVT(n=65), Pulm Thrombosis(n=4),CVT(4),Mesenteric venous thrombosis(n=3) |           |
| Age in yrs   | 32±3.5    |
| Hypertension   | 7(9%)     |
| Tobacco consumption  | 13(17%)   |
| <b>Arterial thrombosis (n=201)</b>                                       |           |
| Coronary events(157),( STEMI-59, USA-96, Prinzmetal-02)                  |           |
| Age in yrs   | 38±2.6    |
| Diabetes   | 8(5%)     |
| Hypertension   | 15(9.5%)  |
| Tobacco consumption  | 17(11%)   |
| Mortality  | 03/59(5%) |
| Stroke(n=42), Acute limb ischaemia(02)                                   |           |
| Stroke   |           |
| Age in yrs   | 41±2.8    |
| Diabetes   | 5(12%)    |
| Hypertension   | 7 (15%)   |
| Tobacco consumption  | 4(10%)    |
| Mortality  | 02(5%)    |

## References

- Fritz R. Rosendaal. Thrombosis in the Young: Epidemiology and Risk Factors. A Focus on Venous Thrombosis. *Thromb Haemost.* 1997;78(1):1-6
- Anand AC, Jha A, Saha A, Sharma V, Adya CM. Thrombosis as complication of extended stay at high altitude. *Nat Med J India.* 2001; 14:197-201.
- Surendra K S, Varun G, Tamilarasu K, Amit B, Ashu S, Atin K, Renu S, Molly MT, Vandana G, Indrishi B, Amit AK. A prospective study of risk factor profile & incidence of deep venous thrombosis among medically-ill hospitalized patients at a tertiary care hospital in northern India. *Indian J Med Res.* 2009; 130: 726-730.
- Wolberg AS, Aleman MM, Leiderman K, Machlus KR. Procoagulant activity in hemostasis and thrombosis: Virchow's triad revisited. *Anesth Analg.* 2012;114(2):275-285
- Cheena Garg, Arjun Aggarwal, Dhruva Chaudhary. Profile of patients of venous thrombosis in medical wards- An observational study. *Int J Cur Res Rev.* 2015;15(7):68-72
- Holst AG, Gorm J, Eva P. Risk Factors for Venous Thromboembolism : Results From the Copenhagen City Heart study. *Circulation.* 2010; 121:1896-1903. Downloaded from

- <http://circ.ahajournals.org/> on 02Jul, 2013.
7. Rajeev G, Soneil G, Krishna SK, Arvind G, Prakash D. Regional variations in cardiovascular risk factors in India: India heart watch. *World J Cardiol.* 2012; 26(4): 112-120.
  8. Rajni S, Shivkumar B, Prasad SR, Nanjappa CM. Clinical characteristics, angiographic profile and in hospital mortality in acute coronary syndrome patients in south Indian population. *Heart India.* 2014;3(2):65-69
  9. Andreas W S, Radovanovic D, Stauffer JC, Windecker S, Urban P, et al. Acute coronary syndromes in young patients: Presentation, treatment and outcome. *IJC.* 148(3):300-304.
  10. Chang WC, Kaul P, Westerhout CM, Graham MM, Fu Y, Chowdhury T et al. Impact of sex on long term mortality from acute myocardial infarction vs unstable angina. *Arch Intern Med.* 2003;163:2476-84.
  11. Xavier D, Pais P, Devereaux PJ, et al. Treatment and outcomes of acute coronary syndromes in India (CREATE): A prospective analysis of registry data. *Lancet.* 2008; 371(9622):1435-1442.
  12. Pandian JD, Srikanth V, Read SJ, Thrift AG. Poverty and stroke in India. A time to act. *Stroke.* 2007;38:3063-3069.
  13. Dash D, Bhashin A, Pandit AK, Tripathi M, Bhatia R, Prasad K, et al. Risk factors and etiologies of ischemic strokes in young patients: A tertiary hospital study in north India. *J Stroke.* 2014;16:173-177
  14. Shah PA, Bardi GH, Naiku BA, Dar AK, Kaul RK. Clinico-radiological profile of strokes in Kashmir valley, North-West India: A study from a university hospital. *Neurology Asia* 2012; 17(1): 5-11.
  15. Pandian JD, Bhullar RS, Kaur P, Dhillon S, Toor G, Singh Y. Trends in the use of intravenous recombinant tissue plasminogen activator from northwest India. *Int J of Stroke* 2012;7:361-365.
  16. Chaudhary HBS, Mohanty CS, Ray S, Singhal A. Relationship between various risk factors and functional outcome in stroke patients- A hospital based study. *IJAR.* 2016; 10(6):99-102.
  17. Lim HY, Nig C, Carole LS, Donnan G, Nandurkar H, Prahad HO. *Blood.* 2015;126:44-68.
  18. Banerjee AK, Varma M, Vasista RKK, Chopra JS. Cerebrovascular disease in north-west India: A study of necropsy material. *J Neurol Neuro Surg psychiatry.* 1989;52:512-515.