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Original Research Paper

Surgery

AETIOPATHOGENESIS, CLINICAL FEATURES OF THROMBOANGIITIS OBLITERANS OF LOWER LIMBS AND ITS CO-RELATION WITH COLOR DOPPLER STUDIES

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ABSTRACT

Background: Buerger's disease is a disease of young men of low socioeconomic status who smoke tobacco and mostly takes place in lower limbs, but now a day the disease has also been seen in young women between 20 and 35 years of age. The disease mainly involves small and medium-sized vessels of the extremities and is a nonatherosclerotic disease. Doppler USG is a valuable modality of imaging in evaluating the characteristics, distribution and assessing the extent of lesions.

Objectives: To evaluate the efficacy of color Doppler in Buerger's and to compare the risk factors and clinical presentation with color Doppler findings in a patient of Buerger's.

Study Type and Design: It was a prospective study conducted in department of surgery Rohilkhand Medical College, Bareilly. 50 Patients of age group 20-50 years and of both genders who were diagnosed with Buerger's disease based on the history and clinical examination were included in the study.

Result: Majority of patients were males in the age group of 40-50 with a few female patients as well, with majority belonging to low socio economic status. On comparison of findings of clinical examination to that of Doppler findings we concluded that new cases were added into the list on color Doppler which were earlier missed on clinical examination which suggests that involved vessels which were missed on clinical examination were picked up on color Doppler.

Conclusion: Doppler ultrasonography is very good modality for diagnosing a patient of Buerger's disease.

KEYWORDS : Buerger's disease, Thromboangiitis Obliterans, color Doppler.

INTRODUCTION:

Thromboangiitis Obliterans or Buerger's disease is a disease of young men of low socioeconomic status who smoke tobacco and mostly takes place in lower limbs, but now a day the disease has also been seen in young women between 20 and 35 years of age. The disease mainly involves small and medium-sized vessels of the extremities and is a nonatherosclerotic disease [1].

The disease shows a worldwide distribution but more common in Indian subcontinent.

Thromboangiitis Obliterans is more common in countries with heavy use of tobacco. There is an extremely high prevalence of Thromboangiitis Obliterans in India among people of low socioeconomic class who smoke bidis (homemade cigarettes with raw tobacco) [2].

Other than smoking, genetic predisposition, immune-mediated mechanisms, hypercoagulable states and an oral infection-inflammatory pathway [3] have been implicated as potential etiologic factors.

The disease usually affects patients younger than 50 years and starts with ischemia of distal small vessels.

Patient presents to us with claudication of the feet, legs, hands, or arms. Eventually with the progression of disease, ischemic pain at rest starts taking place and ischemic ulcerations on the toes, feet, or fingers may develop. Other symptoms may include cold insensitivity, burning pain in the feet and hands, dependent rubor or pallor, cyanosis, skin atrophy, migratory superficial thrombophlebitis, Raynaud's phenomenon, and reduced hair growth.

Newer invasive and non-invasive imaging modalities have led to major improvements in the diagnosis as well as in the treatment of peripheral arterial diseases [4]. Color Doppler USG scan is a cheap non-invasive tool for vascular examination of peripheral arteries. The added benefit of it is that it helps in confirming the diagnosis and can tell us about the exact site of obstruction, in addition to the severity of the disease, by displaying movement of blood flow inside the vessel with lumen decreased more than 50 %. It is currently competing and complementing with the roles of CT, MRI and DSA in the screening, diagnosis and follow-up of peripheral vascular diseases [5]. Doppler examination proves to be a valuable modality of imaging in evaluating the characteristics, distribution, localizing, and assessing the extent of lesions of Thromboangiitis Obliterans or Buerger's disease.

Newer modalities like MR angiography with time will become more popular, but then also USG will still be investigation of choice in countries like ours where health sector is not yet advanced and easily assessable to all. Secondly in cases of uncooperative patients USG will still be the investigation of choice.

The incidence of arterial disease has assumed alarming proportions all over the world and acute occlusions of the arterial tree are catastrophic in their appearance and progress, yet yield good results with early therapeutic measures.

Till now there is no specific treatment that can provide the victim with a sure shot cure. Various numbers of procedures and surgical techniques give a proof that none is satisfactory. And this will continue until we do more research about the exact etiology of the disease, try diagnosing the disease as early as possible and learn the modern trends in the management of patients.

Now the aim and endeavor is to forestall the progress and prevent this tragic finish.

AIM:

- To determine the co-relation between aetiopathogenesis, clinical features of Thromboangiitis Obliterans or Buerger's disease with Doppler ultrasound studies.

OBJECTIVES:

- To evaluate the efficacy of color Doppler in Thromboangiitis Obliterans.
- To compare the risk factors and clinical presentation with color Doppler finding in a patient of Thromboangiitis Obliterans.

MATERIALS AND METHOD.

STUDY METHOD AND DESIGN: My study was conducted as a prospective study in the Department of Surgery in collaboration with the Department of Radiology, Rohilkhand Medical College & Hospital, Bareilly from November 2016 to September 2017. In my study I enrolled all the new cases of our hospital, which were newly diagnosed as cases of Thromboangiitis Obliterans and fulfilled the inclusion criteria like, age below 50 years, chronic smoker, symptoms of ischemia and involvement of either one or both lower limbs.

STATISTICAL ANALYSIS: In my study a proper clinical examination, which included noting the color change, extent and spread of gangrene and absence of peripheral pulses in the affected limbs of the patient was done to clinically find out the level of vascular obstruction and to know the severity of disease. Diseases such as hypertension, DM and hypercholesterolemia were ruled out by routine blood investigations.

After thoroughly examining the patient clinically and assessing the level of obstruction and severity of the disease clinically, we confirmed and cross checked our clinical findings by color Doppler scanning in all our patients. By help of which we confirmed the level of obstruction. By cross matching the findings of clinical examination to that of color Doppler, we were able to know about the efficacy of the investigation in Buerger's disease. Aim of the treatment given was to prevent the foot or lower leg from getting amputated. Patient's response to different modes of treatment were noted down to know about the long term prognosis of the disease and also evaluate the efficacy of treatment.

OBSERVATION AND RESULTS:

- In my study, majority of the patients were males, comprising about 94% of the total patients included in the study.
- Out of 50 patients, from ages of 20 to 50 years, majority of patients were from age of 31 to 40, with the second most common age group being from 20 to 30 years of age.
- In the study majority of the patients belonged to low socio economic status (74%).
- In the study right and left lower limbs were almost equally involved, whereas bilateral lower limbs were involved in only 6 % of the cases.
- In my study all the patients were smokers and majority of them were the ones with more than 20 pack years (80%).
- The symptomatology elicited during the study showed that the most common mode of presentation was IC which was seen in 76% cases, while the second most common mode of presentation was ulceration seen in 32% patients. The next less common symptoms were gangrene (26%), rest pain (24%), superficial thrombophlebitis (4%).

Fig 1:- Gangrene of the toes along with dorsum of foot.

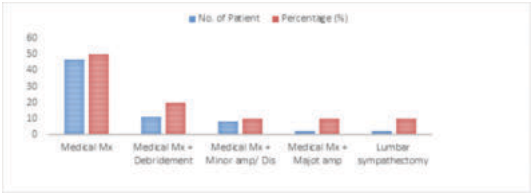
- In the study, on comparison of findings of clinical examination to that of color Doppler findings we concluded that, though the most common group of vessels involved in both were dorsalis pedis, posterior tibial and anterior tibial (32% on clinical examination and 38% on color Doppler) but new cases were added into the list on color Doppler which were earlier missed on clinical examination.

The second group of vessels involved on clinical examination were dorsalis pedis and posterior tibial (30%), but on color Doppler the second commonest group of vessels involved were popliteal artery and below, which suggests that involved vessels which were missed on clinical examination were picked up on color Doppler.

Vessel involved (n = 50)	Involved on clinical examination with %	Involved on color Doppler scanning with %
Dorsalis Pedis alone	05 (10%)	3 (6%)
Dorsalis pedis +posterior tibial	15 (30%)	10 (20%)
Dorsalis pedis + anterior tibial	04 (8%)	5 (10%)
Dorsalis pedis + posterior + anterior tibial	16 (32%)	19 (38%)
Dorsalis pedis +posterior + anterior tibial + popliteal artery	8 (16)	11 (22%)
Dorsalis pedis + posterior + anterior tibial + popliteal artery + femoral artery	2 (4%)	2 (4%)

Table - 1: Correlation of clinical examination and color Doppler findings

- In the study majority of the patients responded to conservative and medical treatment alone, followed by debridement in 22% of the patients. Only 4% of patients required major amputation and lumbar sympathectomy.



Graph -1: Modalities of Treatment

Fig 2. Major above knee amputation.

DISCUSSION

In my study and most of the other studies like by Brown and Allen [6] and Telford and Stopford's [6] Buerger's disease has been found to be between 20- 50 years of age group. It has also been seen that above 50 year's atherosclerosis is more likely the cause of the disease and so above 50 years to diagnose a patient with Buerger's disease we need to have a solid histological proof. So we conclude that it is safe to keep the age group of patient between 20-50 years of age group.
Regarding sex of the patient initially the disease was said to be exclusively of male population with incidence in female population less than 1% [7,8], but in later studies like by Cutler et al. [7] and others it was described that the disease can also take place in female population, though the incidence is quite less. Though now new and increased number of female patients with Buerger's disease are being reported in the west, with the only explanation for this increase in disease prevalence in female population being increased consumption of tobacco[1,9,and10].

Buerger's disease is more common in people with low socio economic status, most probably because these people are more into bidi smoking which is far more dangerous than a filtered cigarette. To support my study there is one study by Bahare Fazeli in which out of 86 patients included 95.4% belonged to low socio economic status families [11].

Salimi J at al. [12] in Iran studied 116 individuals suffering from

Buerger's and reported 99 % patients to be smokers with an average pack year of 22.9, which was the case in my study as well. Thus, by this entire discussion one thing is clear that tobacco in any form plays a major role in initiation and progression of the disease.
In my study, in most of the patient the presenting signs and symptoms were gradual in onset with majority of the patients presented with IC, 38 out of 50 patients that is 76 % presented with IC with or without ulceration or gangrene.

On comparison of the results of my study with the study of Shigehiko Shionoya[13], in which 255 patients were studied from 1977 to 1988, we found that the most common symptom in my study was IC whereas in Shionoya study of 255 patients paraesthesia, coldness and intermittent claudication were the commonest presentation, which is almost comparable as we have taken paraesthesia and coldness as a sign in our study. Another study in PGI Chandigarh on 61 patients by Chopra B. S et al. [14] described IC as the most common symptom followed by rest pain and ulceration/ gangrene.

In my study, I examined the peripheral pulses first by clinically palpating the vessels and confirmed it by the help of color Doppler scanning. On comparison of findings of clinical examination to that of color Doppler findings we came to the conclusion that, by color Doppler scanning new cases were added up, which were missed earlier on clinical examination. Thus concluding that color Doppler is more accurate and efficacious in knowing the exact site of occlusion and to assess the severity of the disease. This is because though clinical examination is good method to assess the peripheral vessels, but it is not diagnostic due to human error and lack of documentation which downgrades the severity of the disease. Efficacy and benefits of color Doppler in diagnosing of PVD has also been proved by various other studies like Anas Ismail et al. [15] and Polak et al. [16].

All 50 patients that is 100 % who were included in my study were given conservative management and medical treatment, either alone or in combination to some surgical management, which has similar results to various other studies done worldwide, such as by Olin JW et al. [10]and W J Grove et al. [2] which showed that majority of the patients were managed conservatively by NSAIDS, oral antibiotics and vasodilators but, when medical management failed they did amputation and lumbar sympathectomy.

CONCLUSION

The age group related to the disease is from 20 – 50 years and within this group also the elderly males that are males between 41- 50 years of age are more commonly affected than the young males. The disease is exclusively the disease of male gender. Though, rarely female smokers are also affected and are more common in people with low socio economic status.

Smoking is the one and only most important causative agent for Buerger's disease to take place, though consumption of other forms of tobacco can also lead to the disease. In comparison to the lower limbs, upper limbs are rarely involved in Buerger's disease and intermittent claudication was the predominant symptom in majority of patients. Other commonly seen symptoms were ulcers, gangrenes and rest pains. On clinical examination the affected limb is cold with muscle wasting and loss of hair.

Duplex color Doppler is a very good modality for diagnosing a patient of Buerger's disease. Though by clinical examination also we can diagnose the disease but the accuracy that color Doppler provides, is not there with clinical examination. The benefit of color Doppler over clinical examination is that, by color Doppler we can assess the severity of the disease, check for collaterals distal to obstruction which helps in planning surgeries like by-pass and lastly it is documented procedure so beneficial in medico legal cases. By the help of color Doppler we can distinguish whether the occlusion is hemodynamically non-significant or there is significant stenosis, by obtaining systolic velocity, peak systolic velocity ratio and spectral waveform.

The benefits of color Doppler over other modalities in examining lower limb vessels, is that color Doppler is a safe modality, cost effective and non- invasive procedure.

If the disease is diagnosed timely then with complete abstinence of smoking along with medical management, majority of patients can be treated by conservative management.

REFRENCES:

1. LieJT. Thromboangiitis obliterans (Buerger's disease) in women. Medicine (Baltimore). 1987; 66: 65- 72.
2. Grove WJ, Stansby GP. Buerger's disease and cigarette smoking in Bangladesh. Ann R Coll Surg Engl 1992; 74: 115- 8.
3. Iwai T, Inoue Y, Umeda M, et al. Oral bacteria in the occluded arteries of patients with Buerger's disease. J Vasc Surg. 2005; 42: 107- 15.
4. Tang GL, Chin J, Kibbe MR. Advances in diagnostic imaging for peripheral arterial disease. Expert Rev Cardiovasc Ther 2010; 8:1447-55.
5. Bradbury AW, Adam DJ. Diagnosis of peripheral arterial disease of the lower limb. BMJ 2007; 334:1229-30.
6. RL Richards - British Medical Journal, 1953 Feb 28; 1(4808): 478–481.
7. Cutler EL: Thromboangiitis obliterans affecting women: Report of a case and review of the literature. Angiology 1959; 10:91-98.
8. Horton BT, Brown GE: Thromboangiitis obliterans among women: Report of a case and review of literature, Aetiology 1959; 10: 91- 98.
9. Mills JL, Taylor LM Jr., Porer JM. Buerger's disease in the modern era. Am J Surg 1987; vol 154: 123-29.
10. J.W. Olin, J.R. Young, R.A. Graor, W.F. Ruschhoupt, J.R. Bartholomew The changing clinical spectrum of thromboangiitis obliterans (Buerger's disease) Circulation, 1990; 82 (suppl IV): 3-8.
11. Bahare Fazeli Arch Med Sci. 2010 Jun 30; 6(3): 343–47.
12. Salimi J, Tavakkoli H, Salimzadeh A, Ghadimi H, Habibi G, Masoumi AA J Coll Physicians Surg Pak. 2008 Aug;18(8):502-5.
13. Shionoya S. Buerger's disease. Pathology diagnosis and treatment. Nagoya, The University of Nagoya Press, 199: 57-77.
14. B.S. Chopra, Thomas Zakariah, J.S. Sodhi, S.K. Khanna, P.L. Wahi Thromboangitis Obliterans: A Clinical Study with Special Emphasis on Venous Involvement Sage Journals February 1, 1976; Volume: 27: issue: 2: 126-32.
15. Ismail A, Saleh MK, Tabari AM, Isyaku K. Clinical and doppler ultrasound evaluation of peripheral arterial diseases in Kano, North-western Nigeria. Niger Postgrad Med J 2015;22:217-22.
16. Joseph F Polak, Mitchell I. Karmel, John A. Mannick, Daniel H. O'Leary, Magruder C. Donaldson, Anthony D. Whittenmore AJR November 1990; 155: 1085- 89.