

Buerger's Disease among the Lower limb Ischaemic Patient in Rajshahi, Bangladesh

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ABSTRACT

Introduction: It is well established that, atherosclerosis is the major cause of chronic lower limb ischaemia in the western countries. Buerger's disease is common in South and Southeast Asia. In Bangladesh, no accurate data is available about the incidence of chronic lower limb ischaemia. Whether Buerger's disease is common or not and how the patients with chronic lower limb ischaemia present in Bangladesh are still not established. **Objectives:** To identify the cause and assess the severity of chronic lower limb ischaemia among the patients admitted in Rajshahi Medical College Hospital. **Methods:** This cross-sectional type of descriptive study was conducted in the Department of Surgery, Rajshahi Medical College Hospital, Rajshahi. A total of 70 cases were included by purposive sampling technique. The inclusion criteria for cases were the patient diagnosed as chronic lower limb ischaemia. Diabetic patients and limb ischaemia following trauma were excluded from the study. **Results:** Among the cases, 59 (84.29%) had Buerger's disease and 11 (15.71%) had atherosclerosis. **Conclusion:** Chronic lower limb ischaemia seemed to be a common problem in northern Bangladesh. Majority of the patients were likely to suffer from Buerger's disease.

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INTRODUCTION

As compared to coronary artery disease (CAD), peripheral arterial disease (PAD) has long been addressed as being negligible in number and importance; a view that had been reassessed in recent years. The PAD has been estimated to reduce quality of life in approximately 2 million symptomatic Americans¹ and millions more Americans without claudication are likely to suffer PAD associated impair-

ment.² In USA, there had been 413,000 discharges per year with chronic PAD, 88000 hospitalization involving lower extremity arteriography and 28000 discharges citing embolectomy or thrombectomy of lower limb arteries.³ In the UK, at least 1 in 20 people over the age of 55 have some degree of PAD.⁴ So, PAD is clearly a big burden in western society. Chronic limb ischaemia is manifested by intermittent claudication, rest pain, non-healing ulcers or

gangrene and may ultimately results in limb losses, atherosclerosis is the main cause. But from different studies, it is clear that there is geographical variation. Though thromboangitis obliterans (Buerger's disease) is rare in western countries, it is common in south and Southeast Asia, the Middle East, and eastern European countries.⁵ In young adults presenting to the Mayo clinic (1953-1981) with lower limb ischaemia, Buerger's disease was diagnosed in 24%.⁶

In western India, Buerger's disease is the predominant peripheral vascular disease. In the period of 1988-1991, RM Jindal et al treated 62 cases of Buerger's disease. Among them, all were male below 42 years of age. A total of 51 cases had peripheral gangrene with intractable pain, while the remaining 11 had non-healing ulcers with severe pain.⁷

Buerger's disease is not uncommon in Japan. Matushita et al studied 105 patients with Buerger's disease, admitted at Nagoya University Hospital between January 1985 and December 1996. Among them, 96% were men and presenting with either gangrene or ulcer in 64%. They mentioned that at their institute, the prevalence of Buerger's disease had been appearing to be decreasing but not significantly that for Atherosclerosis.⁸ Chronic lower limb ischaemia is not an uncommon disease in Bangladesh. In Mymensingh Medical College Hospital, a total of 450 patients underwent limb amputations during the period of 1982- 1987. Among them, 366 (81%) patients had been suffering from chronic limb ischaemia.⁹

In a study of 39 patients with Buerger's disease in Kumudini Hospital Tangail, Bangladesh, found that majority of the patients had ulceration or gangrene at presentation.¹⁰ High incidence of Buerger's disease in the northern part of Bangladesh found in a study at Rajshahi Medical college.¹¹

But still the data for chronic lower limb ischaemia, regarding their incidence, aetiology or clinical presentation, are not sufficient. So, this study was conducted to explore the incidence of Buerger's disease in the north-western part of Bangladesh, which may help to generate a base

line data about the lower limb ischaemic diseases.

METHODS

It was a cross-sectional type of descriptive study, carried out in the Department of Surgery, Rajshahi Medical College, Rajshahi, during the period of January, 2009 to December, 2010. Total 70 cases of chronic lower limb ischaemia were selected by purposive sampling. Patients with acute limb ischaemia and also with chronic limb ischaemia due to trauma and diabetes mellitus were excluded from the study. A face-to-face formal interview of the cases, regarding particulars of the patients's symptoms, history of trauma, co-morbidity and family history, were collected. Thorough clinical examination was carried out of each study participant to assess anaemia, and nutritional status. Examination of lower limbs including inspection and palpation about colour change, skin temperature, trophic changes, ulcer and gangrene were carried out. Vascular assessment was done by examination of peripheral arterial pulsation and Ankle-Brachial Pressure Index (ABPI) measurement. A hand held Doppler (summit Doppler lifedop 150 vascular Doppler, USA) was used for measuring ABPI.

Laboratory investigations included complete blood count, fasting blood sugar and post-parandial blood Sugar, lipid profile, chest X-ray, electrocardiogram, echocardiogram and duplex imaging of lower limb vessels. Biopsy of arteries likely to be involved, such as arteria dorsalis pedis, anterior tibial artery and popliteal artery, had been done in cases underwent amputation. A checklist was used to collect and record the data.

The quantitative data of the study were entered and analyzed by using SPSS (Statistical Package for the Social Science, IBM 2009) software programs. The descriptive analysis included frequency distribution, mean, median and standard deviation. Univariate analysis was done to describe the characteristics of the population. Statistical analysis was carried out by using Chi-square test and t-test. The findings of the study were presented with the help of frequency distribution table, charts, bar diagram etc. Ethical clearance was accepted by the Institutional Review Board of Rajshahi Medical College before starting the study.

RESULTS

In present study, majority 34 (48.6%) was included from age group 31-40 years, followed by 16 (22.9%) in the more than 50 years (Table I).

Table I: Age distribution of 70 cases

Age groups in years	Frequency	
	N	%
20-30	8	11.4
31-40	34	48.6
41-50	12	17.1
More than 50	16	22.9
Total	70	100

All the patients in the study were male. It was revealed that among 70 patients, 34 (48.6%) were farmers, 18 (25.7%) were day laborers, 10 (14.3%) were service holder and others in smaller numbers included businessmen, rickshaw puller (Table II).

Table II: Occupation of study cases

Occupation	Frequency	
	N	%
Farmer	34	48.6
Day labour	18	25.7
Businessman	6	8.6
Rickshaw puller	2	2.9
Service	10	14.3
Total	70	100

All the patients found current smokers. Among them, 30 (42.9%) patients used to smoke 10-20 pack years, 22 (31.4%) patients more than 20 pack years and 18 (25.7%) patients less than 10 pack years. Among 70 patients all had history of pain at presentation; out of them 58 (82.9%) with rest pain and another 12 (17.1%) with intermittent claudication. There was gangrene in different parts of affected limbs in 64 (91.4%) patients; mostly at great toe 52 (81.3%). In cases of 4 (6.3%) patients, gangrene found at dorsum of foot and 2 (3.1%) patients at different toes. Non-healing ulcers with punched out edge found in 14 (20%) patients; among them, 8 (57.1%) at dorsum

of foot and 4 (28.6%) at different toes. There were ischaemic changes in upper limb along with chronic lower limb ischaemia in 8 (11.5%) patients; findings were gangrene in different fingers in 2 patients, had amputee fingers in 6 patients and absent radial arterial pulse in 2 patients. Out of 70 patients, 66 (94.3%) had Ankle-Brachial Pressure Index (ABPI) lower than normal (<1.0) in right lower limbs; among them 34 (51.5%) had ABPI within 0.3-0.49, 24 (42.4%) within 0.5-0.8 and 4 (6.06%) less than 0.3. There were ABPI lower than normal in 58 cases (82.8%); among them 44 (75.8%) within 0.3-0.49 and 14 cases (24.14%) within 0.5-0.8.

Duplex imaging revealed that out of 70 patients, 60 (85.71%) had arteritis and 10 (14.29%) had atherosclerotic lesions. It was also shown in duplex imaging that 55 (78.9%) cases had right lower limbs involvement; among them 24 (43.6%) had popliteal and 28 (32%) had infrapopliteal involvement. In 60 (85.7%) cases, left lower limb involved on duplex imaging; among them 22 (37.7%) had infrapopliteal and 20 (33.3%) had popliteal arterial involvement (Table III).

Table III: Duplex imaging finding of 70 cases with chronic lower limb ischaemia

Cases	Frequency	
	N	%
Arteritis	60	85.7
Atherosclerotic lesion	10	14.3
Total	70	100

Dyslipidemia was found in 6 (8.6%) patients; among them, all had hypertriglyceridemia and 4 cases had elevated LDL and low HDL. Arterial biopsy was possible in those 11 patients who were treated by amputation. Among them, 9 (81.8%) had Buerger's disease and remaining 2 (18.2%) had atherosclerosis (Table IV).

Table IV: Histopathological findings of 11 cases with Chronic lower limb ischaemia

Histopathological diagnosis	Frequency	
	N	%
Buerger's disease	9	81.8
Atherosclerosis	2	18.2
Total	11	100

DISCUSSION

This study explores a high incidence of Buerger's disease in the Rajshahi region of Bangladesh. Out of 70 patients, 59(84.3%) had Buerger's disease and only 11(15.7%) had atherosclerosis. In the current study, Shionnoya's clinical criteria, along with duplex imaging of lower limb vessels made the diagnosis reliable. By considering occupation of majority of study patients 54 (77.2%), it is assumed that majority of the cases were from lower socioeconomic background. Jindal RM et al⁷ stated that invariably all patients affected by Buerger's disease come from the lowest socioeconomic strata of the Indian society and suffer from varying degree of malnutrition.

In this study, no patient was found without gangrene or non-healing ulcer. Most common site of gangrene (90.6%) was great toe including other toes. In addition, all of them complained either intractable rest pain (82.9%) or intermittent claudication (17.1%). Jindal RM et al⁷ studied 62 cases with Buerger's disease in western India, showing 51(82.3%) cases had peripheral gangrene with intractable pain and the remaining 11 (17.7%) had non-healing ulcers with severe pain. Vascular association of Bangalore mentioned that in their experience with about 80 patients with Buerger's disease have not seen a single patient without gangrene or ulcer. Similarly, Grove WJ et al¹⁰ in their study shown that majority of the patients presented with gangrene or ulceration in the Tangail region of Bangladesh.

Most of the study patients 42 (60%) were between 20-40 years. Mean age for Buerger's disease was 40.37 years and that for atherosclerosis was 57.27 years. A very few cases have been reported over 50 years. WJ Grove et al¹⁰ found three 03 (5%) such patients.¹⁰ In this study we found 6(8.9%) cases over 50 years.¹⁰ Atherosclerosis is a disease of old age.

Grove et al¹⁰ confirmed a high incidence of Buerger's disease in the Tangail region of Bangladesh. Rahman et al¹¹ in their study demonstrated a high incidence of Buerger's disease in the northern part of Bangladesh. They stated that smoking bidi might be an important factor for this. Besides smoking, lifestyle habits in

Bangladesh such as not wearing shoes, cultivating rice and jute in the fields of ankle deep mud and water, and the squatting posture of farmers while working in the fields have been reported as the possible aetiological or aggravating factors. Genetic susceptibility has also been suggested with smoking acting as trigger.

All but 2 of the Buerger's disease patients of the present study had palpable femoral artery. Majority of the patients (87.50%) had distal arteries like arteria dorsalis pedis, posterior tibialis and popliteal arteries involvement. Bunicardi et al¹² stated that, Buerger's disease mostly affects small and medium sized arteries, that is digital, plantar and leg arteries and the involvement is distal to proximal.

No female case found in this study might be due to the fact that only 11 patients of atherosclerosis were studied and the incidence of smoking is very low among female in this region.

Smoking found to be a very important risk factor for chronic lower limb ischaemia.¹⁰ All the study subjects were smoker. This study also revealed that the risk of atherosclerosis is related to the amount of smoking and in case of Buerger's disease, smoking history was always present but the amount might not be important. These results were similar to the findings by Hai et al.¹³

In the present study, out of 12 atherosclerotic patients 9 (75%) had comorbidities like ischaemic heart disease (IHD) or stroke. Similar facts were described by Hai et al.¹³

All the cases in this study were male. Buerger's disease is far more common in males than in females.¹⁵ Very few cases have been reported in female. Atherosclerosis is also more common in male than female.¹⁶

More than half (60%) of the present study subjects had bilateral involvement. There was upper limb involvement in 8 (11.5%) cases among the present study subject. All of them had been suffering from Buerger's disease. Mills et al¹⁴ stated that Buerger's disease may involve upper limb in addition to lower limb in up to 16% patients.

Trophic changes seemed to be very common in chronic lower limb ischaemia. In 64 (91.4%) cases of the present study patients found trophic

changes (thinning of skin, hair loss, nail brittling, minor ulcerations in toes, heel, malleoli and ball of foot).

Dyslipidemia, in the form of elevated cholesterol and decreased HDL levels was found to be strongly associated with atherosclerosis. All of the 6 patients with dyslipidemia in this study were atherosclerotic.

The present study had few limitations which were the sample size was relatively small, diagnosis made on clinical criteria with noninvasive investigations and arterial biopsy was possible only in 11 cases.

CONCLUSION

Chronic lower limb ischaemia was found a common problem in the Rajshahi region of Bangladesh showing high incidence of Buerger's disease.

Considering the above facts, it may be recommended that Buerger's disease should be considered first in a patient with lower limb ischaemia in the Rajshahi region of Bangladesh. Social awareness should be raised that smoking is the leading cause of limb ischaemia and gangrene. It is also assumed that further studies should be carried out with larger sample size.

Conflicts of interest: None

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