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Why do patients with limb ischaemia present late to a vascular surgeon? A prospective cohort study from the developing world

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Abstract

Objective: To look into the factors responsible for delay in presentation of limb ischemia patients to a vascular surgeon.

Method: The prospective cohort study was conducted at the Aga Khan University Hospital, Karachi, from October 01, 2016, to August 10, 2018. Patients coming with delayed presentation of both acute and chronic limb ischemia were included. All the patients were assessed by qualified vascular surgeons. SPSS 23 was used for data analysis.

Results: Of the 55 patients, 33(60%) had acute and 22(40%) had chronic limb ischaemia. Mean age of acute cases was 44 ± 23.72 years and it was 60 ± 12.49 years for chronic cases. Overall, the commonest reason behind delay was non-referral by primary physician which was the case with 11(33.3%) patients in the acute group, and 13(59%) in the chronic group. The limb loss in the acute group was 20(60%) and 8(36%) in the chronic group.

Conclusion: Delayed presentation of patients with limb ischaemia is mainly due to non-referral. A robust campaign needs to be launched to reduce the rate of limb loss.

Keywords: Delayed presentation, Factors, Limb ischaemia, Limb loss, Developing world. (JPMA 69: S-3; 2019)

Introduction

Limb ischaemia can be acute or chronic. Acute limb ischaemia (ALI) threatens the viability of limb by sudden cessation of blood supply.¹ Worldwide its incidence is 1.5 cases per 10,000 persons per year.² Major limb amputation is one of the important complications of ALI, and the most important factor responsible for this is the delay in presentation and revascularisation.³ Despite urgent revascularisation, the incidence proportion of major amputation is up to 15%.^{4,5} On the other hand, chronic limb ischaemia (CLI) is also a debilitating disease with a worldwide prevalence of more than 200 million people.⁶ The incidence proportion of major amputation in CLI is 26% over 4 years.⁷ The presentation varies from asymptomatic to gangrene, and similarly the treatment options range from conservative (medications and exercise) to complex surgical revascularisations.⁸ Earlier the presentation, the less complex are the treatment options.

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Timing of presentation followed by intervention from onset of symptoms actually dictates the outcomes in both types of limb ischaemia. For instance, in cases of ALI, the time to intervention should be within 6 hours.⁹ Similarly, patients in earlier stages of peripheral arterial disease (PAD) are found to benefit more from conservative treatment.⁸

In Pakistan, vascular surgery is still in preliminary stages with very limited availability of vascular surgeons at 5-6 tertiary care centres in major cities only. One of those cities is Karachi, the capital of Province Sindh. Except three tertiary care hospitals in Karachi, no other hospital has qualified vascular surgeon in the whole province. The Aga Khan University Hospital (AKUH) is the busiest of those three as far as vascular service is concerned. Our observation is that most of our patients from both within and outside the city present late, and subsequently the outcomes are sub-optimal and less desirable as also reported by an earlier study¹⁰ which mainly audited practices and outcomes in trauma patients only, without stressing much on reasons for delayed presentation. To the best of our knowledge, there has been no study

with the primary aim of finding out the causes behind delayed presentation of patients with limb ischaemia to a vascular surgeon. The current study was planned to fill the gap by finding out the causes for delayed presentation of patients with limb ischaemia to a vascular surgeon, and to assess the outcomes in terms of salvage or loss of limb.

Subjects and Methods

The prospective cohort study was conducted at the Aga Khan University Hospital (AKUH), Karachi, from October 01, 2016, to August 10, 2018. After approval was obtained from the institutional ethics review committee, ALI (Group A) and CLI (Group B) patients with delayed presentation either in outpatient clinic or in emergency room were included. Those who came with delayed presentation of ischaemia but had already consulted a qualified vascular surgeon or those who refused to be part of study were excluded. Due to paucity of evidence exact sample size could not be calculated and it was decided to include at least 50 consecutive patients meeting the inclusion criteria.

Delayed presentation for ALI was defined as patients who presented after 6 hours of the onset of symptoms of acute limb ischaemia (Rutherford Stage II).¹¹ For CLI, delayed presentation was defined as those with either rest pain or tissue loss (Rutherford grade IV and onwards) at the time of first presentation.¹¹ This was considered delayed presentation because ideally CLI patient should consult a vascular surgeon at the time of intermittent claudication. All the patients were assessed and diagnosed by qualified vascular surgeons.

Informed consent was taken from the patients, attendants or guardians. The patient or one of the attendants was interviewed during the admission process regarding reason for delayed presentation. The follow-up information pertaining to limb loss was gathered either directly when the patient had amputation in the same hospital or via phone calls when they had their procedure done elsewhere. Data regarding baseline demographic variables, disease-related variables and reasons for delayed presentation were collected on a pre-designed proforma. SPSS 23 was used for data entry and analysis. All categorical variables were expressed as frequencies and percentages, while continuous variables were mentioned as mean and standard deviation (SD). Causes for delayed presentation in both the groups were analysed using Chi-square test. $P < 0.05$ was considered significant.

Table-1: Baseline Variables of Both Groups.

Variable	Acute Limb Ischemia Group A (n= 33)	Chronic Limb ischemia Group B (n= 22)
Gender		
Male (%)	23 (69.69%)	12 (54.54%)
Age in years (mean, SD)	8-90 (44.73±23.72)	34-90 (60.86±12.49)
Co-morbid		
DM	1 (3%)	8 (36.36%)
HTN	3 (9.09%)	0
Combination	13 (39.39%)	9 (40.9%)
None	16 (48.48%)	5 (22.72%)
Smoker	4 (12.12%)	8 (36.36%)
Non-smoker	29 (87.87%)	14 (63.63%)
Ex-smoker (Quit 10 years back)	0	0
Locality		
Within the city	17 (51.51%)	10 (45.45%)
Outside the city	16 (48.48%)	12 (54.54%)

DM: Diabetes Mellitus, HTN: Hypertension

Table-2: Results of Acute Limb Ischemia (Group A).

Variable	Sample Size (n=33)
Mode of Presentation	
Emergency	31/33 (93.39%)
OPD	02/33 (6.06%)
Cause	
Trauma	18 (54.54%)
RTA	11 (61%)
Fall	05 (28%)
Penetrating trauma	02 (11%)
Embolic	15 (45.45%)
Time of Presentation	
Mean	85.5 hrs (±92.67)
<12hrs	09/33 (27.27%)
>12hrs	24/33 (72.72%)
Reasons for Delay	
Non-referral by Physician	11/33 (33.33%)
Patient unawareness	11/33 (33.33%)
Access to a Vascular Surgeon	11/33 (33.33%)
Financial Issues	0
Limb Loss	20/33 (60.60%)

OPD: Out Patients Department, RTA: Road Traffic Accident.

Results

Of the 55 patients, 33(60%) had ALI and 22(40%) had CLI. In Group A, 23(70%) and in Group B 12(54%) were males. The mean age in Group A was 44±23.72 years, while in Group B it was 60±12.49 years. Status regarding co-morbid conditions, smoking and residency was noted for both groups (Table 1). Causes of injury and reasons for delay were explored and noted for both ALI (Table 2) and CLI (Table 3) patients.

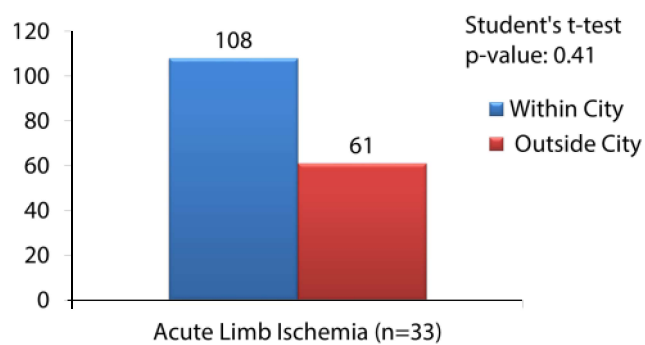


Figure: Mean Duration of Delay (Hours) Vs. Locality of patients with ALI.

Table-3: Results of Chronic Limb Ischemia (Group B).

Variable	Sample Size (n=33)
Mode of Presentation	
Emergency	07/22 (31.8%)
OPD	15/22 (68.18%)
Presenting complaint	
Rest pain and Discoloration	14/22(63.63%)
Rest pain and non-healing ulcer	05/22 (22.7%)
Discolouration (only)	03/22 (13.63%)
Reasons for Delay	
Non-referral by Physician	13/22 (59%)
Patient unawareness	08/22 (36.36%)
Financial Issues	1/22 (4.54%)
Access to a Vascular Surgeon	0
Limb Loss	08/22 (36.36%)

Discussion

The cohort study looked into reasons for delayed presentation of ALI and CLI patients to a vascular surgeon. The patients were classified into those from within or outside the city of Karachi to avoid the bias of time required to travel to Karachi.

Regarding patient population, our study is different from earlier retrospective audits [10,12] as it included both case of both types of ischaemia and looked into the reasons for delayed presentation.

The difference in duration of delayed presentation of patients in both groups from within and outside the city was statistically insignificant ($p > 0.05$). This signifies unawareness about the vascular diseases and about the presence of vascular surgeons among both the patients and the primary care physicians. The most likely explanation to this statement is that the patient belonging to Karachi, having quick access to a vascular surgeon round the clock, should ideally reach well in time, but the results turned out to be different.

Among various reasons, inability of primary care physician to diagnose an ischaemic limb, both acute and chronic, and to timely refer the patient to a vascular surgeon stood on top of the list. In a developing country like Pakistan, it is not uncommon to find the history of consultation with a general practitioner and following symptomatic treatment for initial period. The referral to a specialist is usually delayed till the condition gets worse, making it nearly impossible to achieve the ideal outcome. This is mainly due to unawareness about vascular diseases in the general practitioners and partly due to lack of proper referral system in the national healthcare system.

The other common reason is unawareness on the part of patients regarding vascular diseases as an entity. This is related to lack of proper awareness campaign and lower literacy rate countrywide. Working on both will help us achieve the desired outcomes.

Non-availability of a vascular surgeon in the city was also a reason for delayed presentation in many ALI cases. As per our knowledge, in the whole province of Sindh, only Karachi has three centres with qualified vascular surgeons, while the rest of the province is still waiting to have one. A formal fellowship in vascular surgery exists at AKUH, and it is approved by the College of Physicians and Surgeons Pakistan (CPSP). It produces at least one vascular surgeon every two years. This is going to cater to the needs of the province as well as the Country in the future.

Only a minority of patients failed to consult a vascular surgeon due to financial constraints, which was against our expectations considering the level of poverty in the country and the lack of health insurance system.

The rate of limb loss was significantly higher in both groups compared to earlier data¹³ for CLI and ALI.^{4,5} A study conducted in India¹⁴ mentioned amputation rate of 32% in patients who presented 24 hours after the onset of ALI, which is nearly half that in our study, likely due to the reasons mentioned above. Majority of these patients are young or still working as seen in our study. The whole family is usually dependent on them. Loss of one limb axes the income of the whole family. In terms of limitations, we did not include other centres of Karachi that also receive ALI and CLI patients and that might affect the overall picture. However, our hospital is serving a large proportion of such patients. Also, we did not consider the level of arterial occlusion/injury in ALI cases, which is an important risk factor along with timing as far as the

outcome of that limb is concerned. Another possible limitation is inclusion of patients coming from outside the city, but a separate analysis between patients from within and outside the city ruled out that bias. The greatest strength of this study is being first of its kind to look into the reasons behind delayed presentation of patients with both types of limb ischaemia. Based on the findings, we recommend certain initiatives at various levels to improve the outcomes. Knowledge about vascular diseases in Pakistan is very limited. We suggest organising general awareness sessions regarding presentation and immediate care of ALI and CLI cases in different cities. To reduce the delays, knowledge about hospitals where qualified vascular surgeons are available is to be spread across the country with the help of electronic and print media.

It is important to improve awareness among the general physicians who receive majority of patients as being the primary source of health provision. An awareness programme regarding signs and symptoms of limb ischaemia in different parts of the country with the help of Pakistan Society for Vascular Surgery is going to go a long way in that direction. To further strengthen it, workshops on emergency vascular surgery procedures for general surgeons have been organised in cities where vascular surgeons are not available. Such workshops need to expand their area of coverage.

Many medical graduates and surgical trainees are unaware of vascular surgery as a separate entity, since they never get a chance to study or rotate in this specialty. Inclusion of vascular surgery in the curriculum / training will greatly enhance their understanding about this discipline. This might convince them to select vascular surgery as their final career, hence more vascular surgeons will be produced and available to serve the population at risk. Even if they turn out to be general practitioners, they will be able to pick up the hard signs of ischaemia due to background knowledge acquired during training. Appropriate referral system from primary to secondary and tertiary health care centres needs to be in place. This will reduce the undue delays related to transfer of patients. Introduction of a national healthcare insurance programme will support the general population in many ways.

Conclusion

The common reasons for delayed presentation of both ALI and CLI patients to a vascular surgeon included non-referral by primary physician and unawareness in the general population.

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