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TOPIC: FREQUENCY OF PERIPHERAL ARTERIAL DISEASE IN PATIENTS WITH LMS CORONARY ARTERY DISEASE UNDERGOING PCI

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ABSTRACT
Background: PAD is an important complication of systemic atherosclerosis and is often the result of more advanced involvement of the coronary arteries. Left Main Coronary Artery Disease patients frequently have diffused vascular disease, which can involve the coronary vasculature. There are few available regional data on the prevalence of PAD among this population at risk. Hence, the current study was designed to find the prevalence of PAD in patients with LMS CAD undergoing PCI.
Study Design: Descriptive cross-sectional study.
Place and Duration of Study: This study was carried out in the Department of Cardiology Armed Forces Institute of Cardiology/National Institute of Heart Diseases, Rawalpindi from November 2025 to March 2026.
Methods: The number of patients included were 250 with LMS coronary artery disease who received PCI. A sample size was determined using the formula given by the World Health Organisation. The patients of either sex aged 30-80 years were recruited using non-probability consecutive sampling. PAD was clinically evaluated and confirmed by measuring the ankle-brachial index. SPSS (Version 26) was used for the analysis of demographic and cardiovascular risk factors.
Results: 58 (23.2%) of patients were diagnosed with PAD. Older patients, smokers, diabetics and hypertensive patients had the highest frequency.
Conclusion: In patients with LMS coronary artery disease, PCI, PAD was often identified, underlining the importance of early vascular assessment in high-risk cardiac patients.

KEYWORDS: Peripheral arterial disease, LMS disease, PCI, Atherosclerosis, Coronary artery disease, Ankle-brachial index

1. INTRODUCTION

Peripheral arterial disease (PAD) is a significant clinical expression of systemic atherosclerosis, is characterized by the constriction or blockage of the peripheral arteries most commonly the lower limbs [1]. Due to the deposition of plaques in the artery wall, it causes deterioration of blood flow, ischemic symptoms, decreased mobility, and increased the risk of cardiovascular events [2]. The condition is often underdiagnosed, as many PAD patients do not have any symptoms, and others have atypical symptoms, such as fatigue in the legs, numbness, and a decrease in walking ability rather than classical intermittent claudication.

The similarities and differences between coronary artery disease (CAD) and PAD include close pathological mechanisms and risk factors, including diabetes mellitus, hypertension, dyslipidaemia, cigarette smoking, obesity, advanced age, and sedentary lifestyle [3]. Atherosclerosis is a diffuse vascular pathology; therefore, when one of the vascular beds is affected, it is likely to be associated with other vascular beds [4]. Thus, the existence of PAD in CAD patients indicates a higher overall atherosclerotic burden and could be a predictor of poor clinical outcome.

LMS coronary artery disease is one of the most severe types of coronary artery disease because the left main coronary artery supplies a significant amount of myocardial tissue via the left anterior descending artery and left circumflex artery. LMS stenosis that is significant enough can affect the blood flow to a big portion of the heart, and it carries a high risk of myocardial infarction, heart failure, arrhythmia and death [5]. Revascularisation via

percutaneous coronary intervention (PCI) is being increasingly seen in selected patients with suitable anatomy of the LMS disease, or in those with a high surgical risk [6].
This is clinically relevant as PAD is found in patients with LMS coronary artery disease with PCI. PAD could be a marker of complex vascular disease, elevated procedural risks, and elevated risks for adverse cardiovascular and limb-related outcomes in follow-up (Shamkhani et al., 2024). Furthermore, in patients with PAD, secondary prevention should be more aggressive, such as taking antiplatelet agents, lowering lipids, quitting smoking, controlling blood sugar, controlling blood pressure, and supervised exercise therapy [7].
Clinical implications of PAD in patients undergoing PCI procedure for LMS coronary artery disease [8]. PAD can be a sign of complex vascular disease, increased procedural risk and increased likelihood of adverse cardiovascular and limb-related outcomes in follow-up. Furthermore, more intensive secondary prevention may be required in PAD patients including antiplatelet therapy, lipid-lowering therapy, smoking cessation, glycaemic control, blood pressure management, and supervised exercise therapy [9].

2. Objective

The aim is to identify the prevalence of peripheral arterial disease in patients with LMS coronary artery disease undergoing PCI.

3. METHODOLOGY

The study was a descriptive cross-sectional study that was carried out on 250 patients who were diagnosed with left main stem (LMS) coronary artery disease and undergoing percutaneous coronary intervention (PCI). A 95% confidence level, 5% margin of error, and expected frequency of peripheral arterial disease out of the past literature were used to calculate the sample size using WHO sample size formula. Both male and female patients aged 30 years and above, with angiographically confirmed LMS disease were included. Patients having a prior amputation of a limb, acute limb ischemia, or incomplete recording of the patient were excluded. Age, gender, diabetes mellitus, hypertension, smoking, dyslipidaemia, and clinical history were used to record data. The peripheral pulse examination and the ankle-brachial index were used to assess peripheral arterial disease. The data collected were used to find out the prevalence of PAD in the study population.

3.1 Inclusion Criteria

They included patients aged 30 years and above of either gender, diagnosed with angiographically confirmed left main stem coronary artery disease, and were scheduled to undergo percutaneous coronary intervention. The patients who had fully paid informed consent and had comprehensive clinical records, risk-factor information and ankle-brachial index evaluation were enrolled into the study.

3.2 Exclusion Criteria

Patients who had a lower-limb amputation previously or had acute limb ischemia or severe peripheral trauma, known vascularity's, or congenital vascular disease were excluded. The study was also excluded to patients with previous peripheral revascularization or incomplete medical records, or who declined to provide informed consent or unable to undergo ankle-brachial index measurement.

3.3 Data Collection Procedure

Eligible patients who had angiographically confirmed left main stem coronary artery disease and undergoing percutaneous coronary intervention were enrolled with the consent of the hospital ethical review committee. Each participant signed an informed consent which was written. The demographic data (age, gender) was put on a structured proforma. There was also documentation of clinical history with regards to diabetes mellitus, hypertension, smoking, dyslipidaemia and past cardiovascular incidents. Bilaterality of the peripheral pulses was studied and ankle-brachial index was determined by a standard method. Patients with either an abnormal ankle-brachial index or clinical findings of poor peripheral circulation were termed as having peripheral arterial disease. All the data collected were checked to ensure that they were complete.

3.4 Data Analysis

Data were entered and analyzed using SPSS software. Quantitative variables such as age were presented as mean and standard deviation, while qualitative variables including gender, diabetes mellitus, hypertension, smoking status, dyslipidaemia, and peripheral arterial disease were expressed as frequencies and percentages. The overall frequency of peripheral arterial disease was calculated among patients with left main stem coronary artery disease undergoing PCI. Stratification was performed for age, gender, diabetes mellitus, hypertension, smoking, and dyslipidaemia to assess differences in PAD distribution. A p-value of ≤ 0.05 was considered statistically significant.

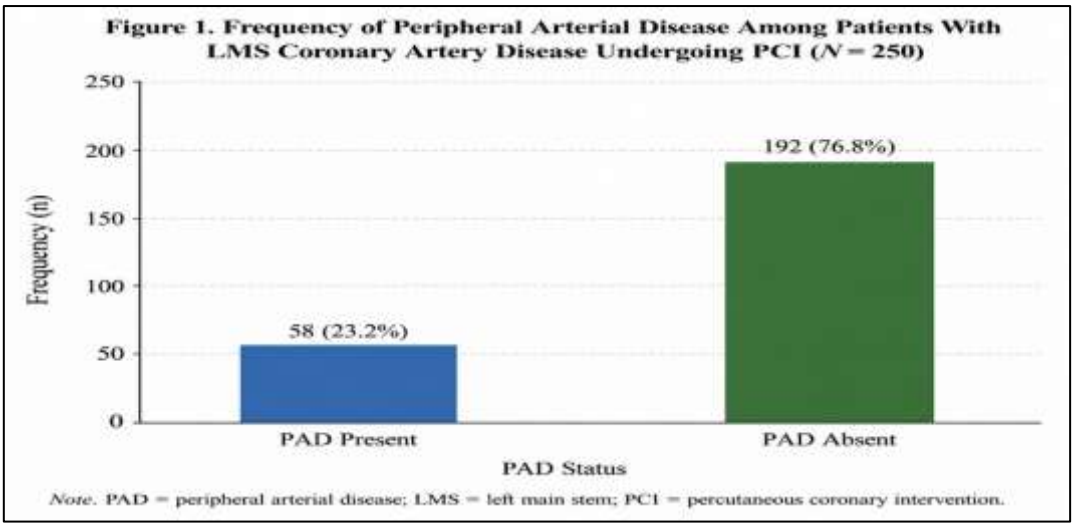
4. RESULTS

They included 250 patients with left main stem coronary artery disease who were undergoing PCI. The mean age was 58.6 ± 9.4 years. Among them, 165 patients (66.0%) were male, and 85 patients (34.0%) were female. It was found that 58 patients (23.2%), had peripheral arterial disease, and 192 cases, (76.8), had no evidence of PAD. Older patients, smokers, diabetics, and hypertensive patients were more likely to have PAD.

Table 1. Frequency of Peripheral Arterial Disease Among Patients With LMS Coronary Artery Disease Undergoing PCI (N = 250)

PAD Status	Frequency (n)	Percentage (%)
PAD Present	58	23.2
PAD Absent	192	76.8
Total	**250**	**100.0**

N = total sample size; PAD = peripheral arterial disease; LMS = left main stem; PCI = percutaneous coronary intervention.



In figure 1, the prevalence of peripheral arterial disease among patients with LMS coronary artery disease receiving PCI is shown. Out of 250 patients, 58 patients (23.2%) had PAD, while 192 patients (76.8%) had no PAD. This means that close to quarter of the study population had peripheral arterial disease.

Table 2. Gender Distribution of Study Participants Undergoing PCI for LMS Coronary Artery Disease (N = 250)

Gender	Frequency (n)	Percentage (%)
Male	165	66.0
Female	85	34.0
Total	**250**	**100.0**

Note. LMS = left main stem; PCI = percutaneous coronary intervention.

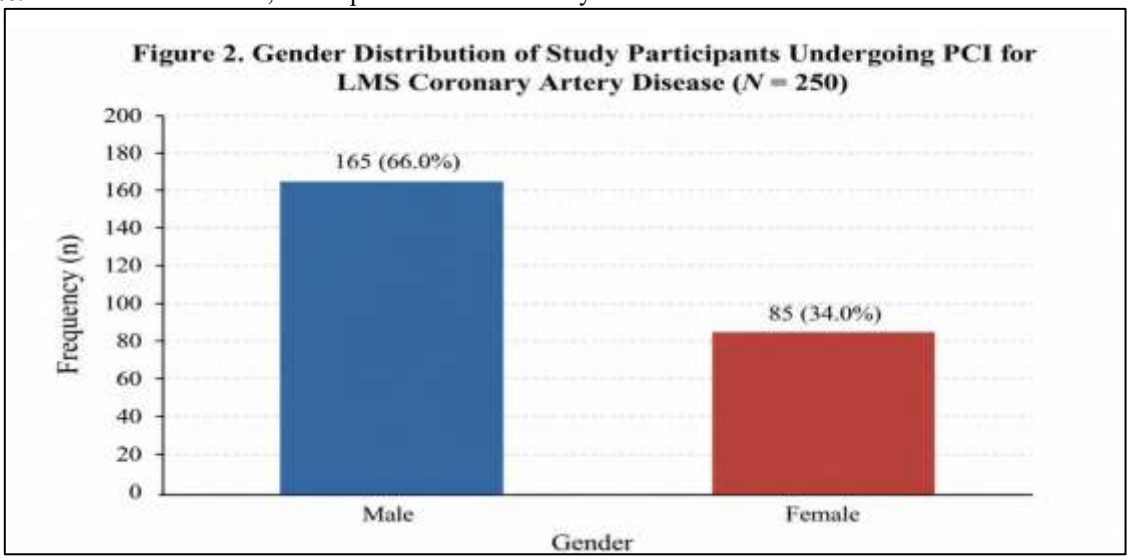
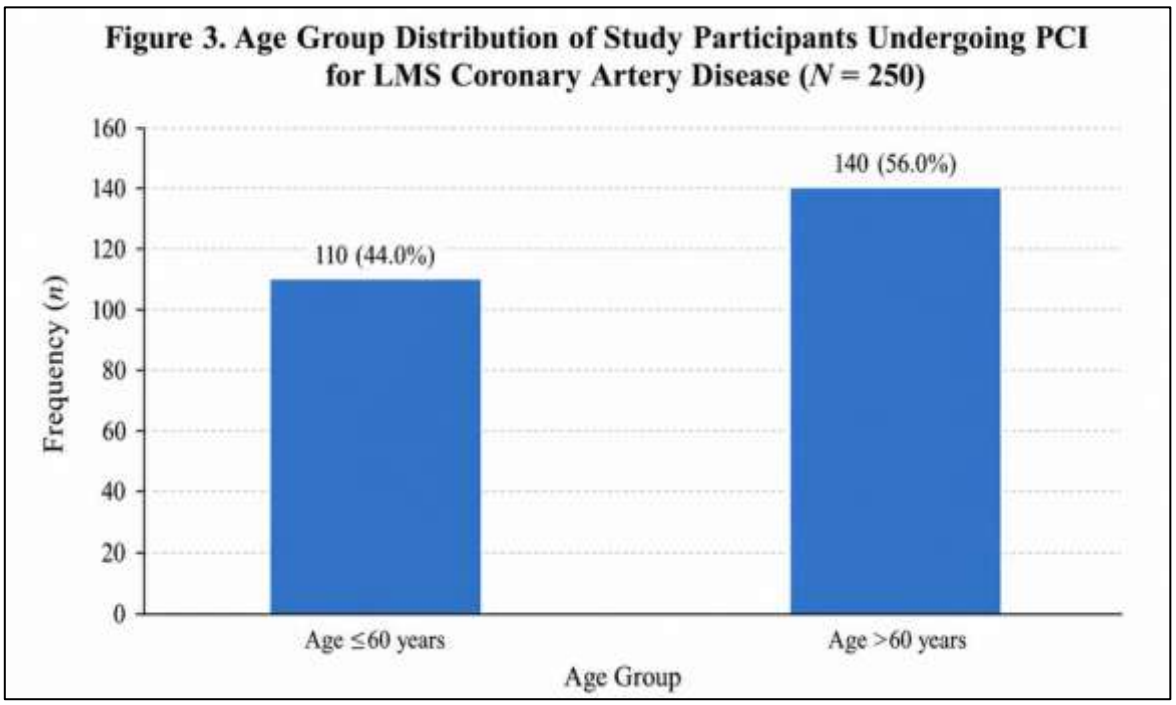


Table 2 presents the gender distribution of the participants of the study. Among 250 patients, 165 (66.0%) were male and 85 (34.0%) were female. The results show that the majority of the study population undergoing PCI due to LMS coronary artery disease were male, and therefore, there was a predominance of males in the study population.

Table 3. Age Group Distribution of Study Participants Undergoing PCI for LMS Coronary Artery Disease (N = 250)

Age Group (years)	Frequency (n)	Percentage (%)
≤60	110	44.0
>60	140	56.0
Total	**250**	**100.0**

Note. LMS = left main stem; PCI = percutaneous coronary intervention.



The age group distribution of the study participants is shown in Table 3. Out of 250 patients, 110 (44.0%) were aged 60 years or below, while 140 (56.0%) were aged above 60 years. This indicates that most PCI patients with LMS CAD were in the older age group.

Table 4 Distribution of Diabetes Mellitus Among Study Participants Undergoing PCI for LMS Coronary Artery Disease (N = 250)

Diabetes Mellitus	Frequency (n)	Percentage (%)
Present	112	44.8
Absent	138	55.2
Total	**250**	**100.0**

LMS = left main stem; PCI = percutaneous coronary intervention.

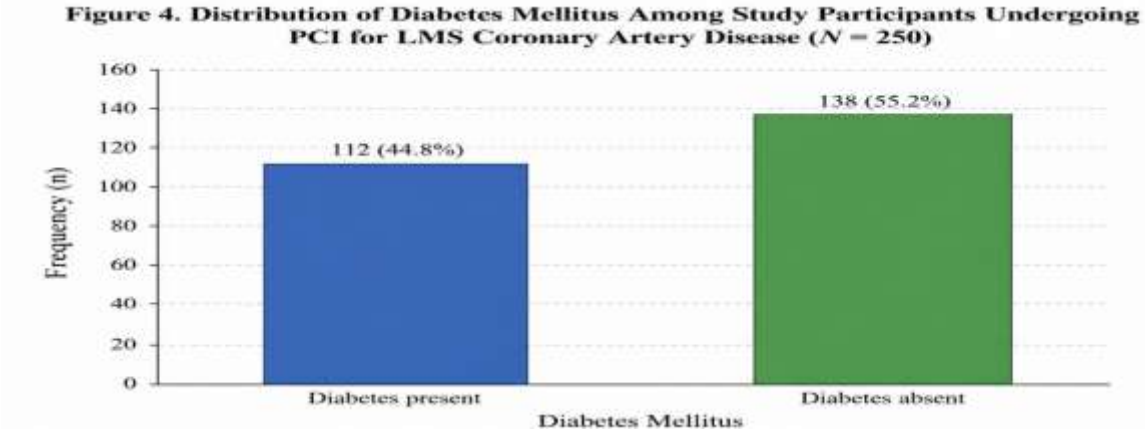


Table 4 gives the distribution of diabetes mellitus among the participants of the study. Out of 250 patients, 112 (44.8%) had diabetes, while 138 (55.2%) were non-diabetic. These results suggest that diabetes was a significant comorbidity among patients with LMS coronary artery disease undergoing PCI as nearly half of patients had diabetes.

Table 5. Distribution of Hypertension Among Study Participants Undergoing PCI for LMS Coronary Artery Disease (N = 250)

Hypertension	Frequency (n)	Percentage (%)
Present	155	62.0
Absent	95	38.0
Total	**250**	**100.0**

LMS = left main stem; PCI = percutaneous coronary intervention.

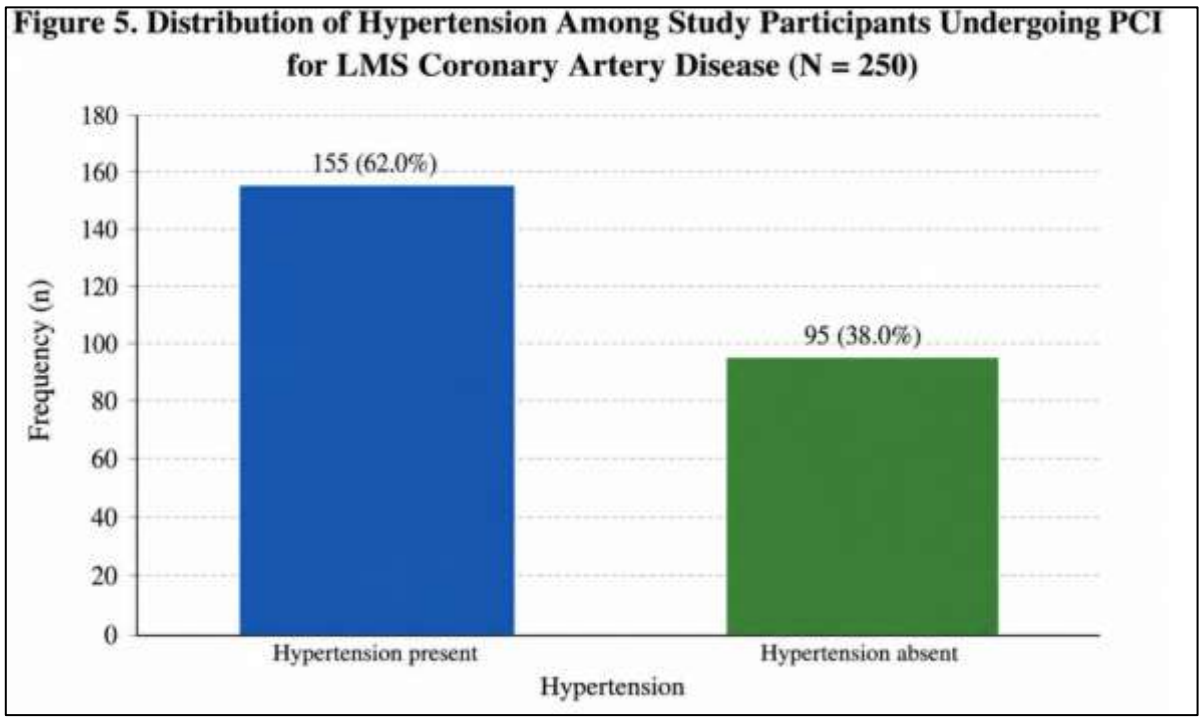


Table 5 indicates the prevalence of hypertension among the participants of the study. Out of 250 patients, 155 (62.0%) were hypertensive, while 95 (38.0%) were non-hypertensive. These findings suggest that hypertension had a high prevalence in patients with LMS coronary artery disease undergoing PCI and is an important cardiovascular risk factor.

5. DISCUSSION

Peripheral arterial disease (PAD) and left main stem (LMS) coronary artery disease are both important manifestations of systemic atherosclerosis [10]. In this study, PAD was detected in 58 out of 250 patients giving an incidence of 23.2% in patients presenting with LMS coronary artery disease undergoing percutaneous coronary intervention (PCI). This observation implies that almost 25 percent of patients with a substantial coronary artery disease also demonstrated the presence of peripheral vascular involvement. The fact that PAD exists in this high-risk cardiac population, underscores the diffused nature of atherosclerosis and the significance of assessing vascular disease outside the coronary circulation.

The patients with LMS coronary artery disease are already known to represent a clinically critical group of patients since the left main coronary artery is a significant myocardial territory in patients [11]. Obstruction in this vessel may result in large areas of myocardial ischemia, heart failure, arrhythmias, and an increased risk of mortality . PAD may result in the patient having a more developed systemic vascular disease, increased atherosclerotic load, and poor long-term cardiovascular outcomes. Therefore, clinical significance of the PAD detection in the patient with PCI induced by LMS diseas [13].

The prevalence of PAD was found more frequently in older patients, men, diabetics, hypertensive patients and smokers. The age factor is a significant risk factor since vascular stiffness, endothelial dysfunction, and plaque burden are all on the increase with increasing age. It was revealed that 140 patients (56.0% of the total number) were older than 60 years in age, which could be the reason why PAD is more prevalent in this age group [14]. There was also male dominance with 165 (66.0) out of 240 patients being male. It could be connected to more exposure to classic cardiovascular risk factors, such as smoking and work-related stress [15].

The presence of diabetes mellitus among 112 patients (44.8%), was clinically significant since diabetes accelerates the atherosclerosis process by damaging endothelium, causing inflammation, oxidative stress, and atypical lipid metabolism. Diabetic patients also tend to have silent or atypical PAD because of the related neuropathy that could lead to late diagnosis. One of the most prevalent risk factors among the study population was hypertension, which was present in 155 patients (62.0%). Sustained hypertension leads to injury of the arterial walls and facilitation of the development of atherosclerotic plaque in both coronary and peripheral arteries [16].

The prevalence of PAD in the present study highlights the importance of routine screening of patients with LMS coronary artery disease, particularly prior to or during PCI admission. Patients with PAD can be identified with the help of simple clinical examination, peripheral pulse assessment, and ankle-brachial index measurement [17]. Early detection enables clinicians to embark on proper preventive measures, which include the use of antiplatelet therapy, statins, smoking cessation, diabetes management, blood pressure management, diet change, and exercise rehabilitation [18].

In general, the results indicate that PAD is a common comorbidity condition among LMS coronary artery disease patients undergoing PCI [19]. Its presence cannot be overlooked because it indicates a high level of atherosclerosis and might affect the short-term and long-term results [20]. The multifaceted cardiovascular examination and vigorous control of the risk factors are required to advance prognosis among this high-risk patient group [11].

6. CONCLUSION

In patients with left main stem coronary artery disease undergoing percutaneous coronary intervention, peripheral arterial disease was found in a significant proportion of patients. In this report, 58 of the 250 patients (23.2 percent) had PAD, indicating that almost one-quarter of the study population had a systemic atherosclerotic involvement beyond the coronary arteries. PAD was prevalent in the older patients and patients with diabetes mellitus, hypertension, smoking history, and dyslipidaemia. These results highlight the importance of regular PAD screening in patients undergoing PCI due to LMS coronary artery disease. Clinical examination and ankle-brachial index measurement may contribute to a better assessment of risks and development of a holistic treatment. Appropriate management of cardiovascular risk factors could be used to minimize future cardiac and peripheral vascular complications.

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