HSPI The Open Access Publisher

JCCM JOURNAL OF CARDIOLOGY AND CARDIOVASCULAR MEDICINE
ISSN 2575-0143

Observational Study

Causes of Coronary Angioplasty Denial in Patients Diagnosed with Significant Coronary Artery Disease in East Afghanistan

Akmal Shams[1], Ikramullah Ibrahimi[2]* and Humayoun Chardiwal[2]

[1]Cardiologist, Afghan Momand Medical Complex & Research Center, Nangarhar, Afghanistan
[2]Lecturer, Medical Faculty Nangarhar University, Nangarhar, Afghanistan

Abstract

Coronary Artery Disease (CAD) is a leading cause of mortality worldwide, with coronary angioplasty being a crucial intervention for patients with significant disease. This study aimed to identify and analyze the causes of coronary angioplasty denial in patients with significant coronary artery disease in Afghanistan, focusing on demographic, socioeconomic, and clinical factors.

A case-control study was conducted with a sample size of 213 patients diagnosed with significant CAD at tertiary care center in Afghanistan. The case group consisted of 106 patients who were denied angioplasty, and the control group included 107 patients who underwent the procedure. Data were collected on demographic characteristics, comorbidities, education, residence, functional status, income, and the reasons for angioplasty denial. Descriptive statistics and comparative analyses were performed to assess the factors associated with denial.

The primary reasons for angioplasty denial were financial constraints (45.3%, $p < 0.001$), limited hospital facilities (15.1%, $p = 0.045$), patient refusal (23.6%, $p < 0.001$), and physician preference for conservative management (12.3%, $p = 0.091$). Denial rates were higher among patients who were older, had multiple comorbidities, were from rural areas, and had lower education and income levels. Illiteracy and cultural beliefs contributed significantly to patient refusal, while inadequate healthcare infrastructure disproportionately affected rural populations.

Financial and infrastructural barriers are the leading causes of coronary angioplasty denial in Afghanistan, exacerbating disparities in healthcare access, particularly among low-income and rural patients. Addressing these issues through policy reforms, improved healthcare infrastructure, and targeted public health education is essential to reducing CAD-related morbidity and mortality in the country.

More Information

***Address for correspondence:** Ikramullah Ibrahimi, Lecturer, Medical Faculty Nangarhar University, Nangarhar, Afghanistan, Email: ikr.ibrahimi@gmail.com

Submitted: October 24, 2024
Approved: October 29, 2024
Published: October 30, 2024

How to cite this article: Shams A, Ibrahimi I, Chardiwal H. Causes of Coronary Angioplasty Denial in Patients Diagnosed with Significant Coronary Artery Disease in East Afghanistan. J Cardiol Cardiovasc Med. 2024; 9(3): 153-157. Available from: https://dx.doi.org/10.29328/journal.jccm.1001197

Keywords: Coronary angioplasty; Coronary artery disease; Healthcare access; Financial barriers; Afghanistan; Patient refusal; Case-control study

Introduction

Coronary Artery Disease (CAD) is a significant health burden globally and is particularly devastating in low- and middle-income countries, where access to healthcare and life-saving interventions is often limited. According to the World Health Organization (WHO), CAD remains the leading cause of death worldwide, responsible for an estimated 17.9 million deaths annually, accounting for approximately 31% of all global death [World Health Organization, 2020]. In many developing countries like Afghanistan, the healthcare infrastructure struggles to keep pace with the rising incidence of CAD, often exacerbated by the lack of resources, insufficiently trained medical staff, and economic instability [1].

Coronary angioplasty, also known as Percutaneous Coronary Intervention (PCI), is a minimally invasive procedure that can restore blood flow in blocked coronary arteries. It has been proven to reduce mortality, relieve symptoms, and improve quality of life in patients with significant CAD [2]. However, despite its clear benefits, many patients in Afghanistan are denied this procedure. In fact, awareness regarding myocardial infarction especially symptoms, and management in Nangarhar (Afghanistan) context is not sufficient to prompt proper care at earliest time [3]; myocardial infarction symptoms are believed to be due to peptic ulceration disease. However, it was shown that approximately 69% patients presenting with typical chest pain had significant coronary artery disease on their angiographies [3].

Previous studies in other low-income countries have identified financial barriers, inadequate medical infrastructure, cultural perceptions, and physician-related factors as the major causes of angioplasty denial [4,5]. In particular, financial constraints are often a primary obstacle due to the high cost of the procedure and the limited availability of public health insurance programs. Additionally, the lack of specialized facilities and trained healthcare professionals in remote and rural regions of developing countries further exacerbates this issue [6].

The current study seeks to explore and analyze the causes of coronary angioplasty denial in patients with significant coronary artery disease in Afghanistan. By employing a case-control study design, this research aims to identify specific factors contributing to denial and to propose potential solutions that can help improve access to interventional cardiology in Afghanistan's challenging healthcare landscape. Given the growing prevalence of CAD in the region, understanding these barriers is essential for guiding future healthcare policies and ensuring that patients receive timely and appropriate care.

Methodology

Study design

This is a case-control study conducted over six months at major tertiary care hospital (Afghan Momand Medical Complex and Research Center) in East Afghanistan in the year 2024. The sample size was 213 patients with significant coronary artery disease, as determined by angiographic findings selected through non-probability convenient sampling.

Case selection

Cases: Patients (n = 106) with significant coronary disease who were denied coronary angioplasty (Patients or their attendants denied).

Controls: Patients (n = 107) with significant coronary disease who underwent angioplasty.

Data collection

Data were collected through structured questionnaires and patient medical records. Key variables included age, sex, socio-economic status, comorbidities (e.g., diabetes, hypertension), availability of hospital services, physician recommendations, and patient or family refusal.

Statistical analysis

Data was analyzed using SPSS (Statistical Package for Social Sciences) software version 26. Chi-square tests were used to compare categorical variables, and logistic regression was employed to identify independent predictors of angioplasty denial. Results were considered significant at p - values less than 0.05.

Ethical consideration

Privacy of the study subjects was secured using medical record numbers only and the article received ethical approval from the ethical committee of Nangarhar University coded as IRB 3721 dated 9/8/2024. In addition, the authors received informed consent for participation and publication.

Significant coronary artery disease

Significant coronary artery disease was defined as having at least 50% stenosis in one of the three epicardial coronary vessels major epicardial arteries (Left anterior descending, left circumflex, and right coronary artery) [7].

Results

The study included 213 patients diagnosed with significant Coronary Artery Disease (CAD) at tertiary care centers in Afghanistan. Of these, 106 patients (49.8%) were denied coronary angioplasty (the case group), while 107 patients (50.2%) underwent the procedure (the control group). Demographic results of the study are shown in Table 1.

Descriptive statistics of the patients are shown in Table 2 with further details in the two groups (cases and controls). In fact, it appears that mean age and mean comorbidities were slightly higher in the case group in comparison to controls. Meanwhile, monthly income ($) was lower in the angioplasty denial group compared with controls.

Angioplasty denial across demographic parameters is shown in Table 3. Men were more likely to have denied angioplasty compared to females.

Furthermore, Angioplasty denial was found to have been inversely related to income level i.e. the higher the income, the lower the angioplasty denial as shown in Figure 1.

Table 1: Demographic information.

Demographics		Count	Percentage
Gender	Male	165	77.5%
	Female	48	22.5%
Age Groups	< 40	24	11.3%
	40-60	130	62.3%
	> 60	59	26.4%
Comorbidities	Diabetes	78	36.6%
	Hypertension	144	67.6%
	Chronic kidney disease	32	15%
	Previous myocardial infarction	53	24.9%
Education level	Illiterate	85	39.9%
	Primary education	71	33.3%
	Secondary education or higher	57	26.8%
Residence	Urban	145	68.1%
	Rural	68	31.9%
Income Levels	Low income (< $100/month)	93	43.7%
	Middle income ($100-$300/month)	91	42.7%
	High income (> $300/month)	29	13.6%

Table 2: Descriptive statistics.

Descriptive statistics	Mean	Denied angioplasty	Underwent angioplasty
Age	56.2 ± 11.4	58.1 ± 12.2	54.3 ± 10.3
Income ($/month)	140	105 ± 60	175 ± 100
Comorbidities	2.3 ± 1.1	2.7 ± 1.2	1.9 ± 0.8

Table 3: Angioplasty denial over demographic parameters.

Demographics		Angioplasty denial (%)
Gender	Male	84%
	Female	16%
Age Groups	< 40	4.7%
	40-60	62.3%
	> 60	33%
Comorbidities	Diabetes	45.3%
	Hypertension	69.8%
	Chronic kidney disease	17.9%
	Previous myocardial infarction	25.5%
Education level	Illiterate	46.2%
	Primary education	34.9%
	Secondary education or higher	18.9%
Residence	Urban	62.3%
	Rural	37.7%

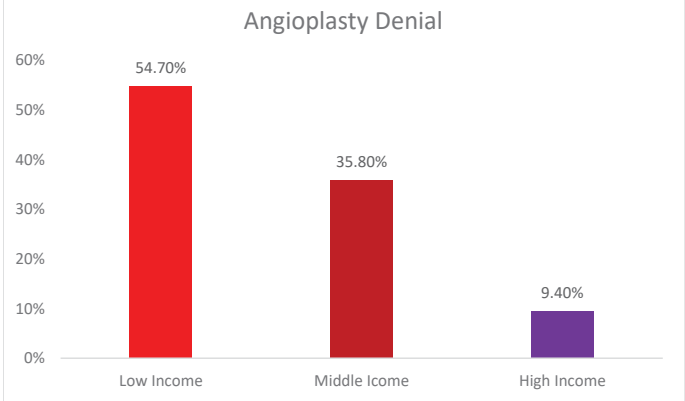

Figure 1: Angioplasty denial across income levels.

Figure 1 shows that angioplasty denial was higher (54.7%) in patients with lower monthly income i.e. less than 100 dollars per month.

Major causes of angioplasty denial included financial constraints, patient refusal, physician preference for medical conservative management, hospital facilities, and others such as logistic issues, conflict with work, and family responsibilities. In fact, most patients reported that they could not afford the procedure as shown in Figure 2.

Figure 2 shows that financial issues were the biggest barrier against angioplasty (45.3%) followed by patient refusal (23.6%), Hospital facilities limitations (15.1%), physician preference for conservative management (12.3%) in cases of very old age and many comorbidities or poor functional status, and other reasons (3.7%).

The results of a logistic regression analysis that investigates the independent factors contributing to coronary angioplasty denial are shown in Table 4 with odds ratio, confidence interval, and statistical significance.

With an odds ratio (OR) of 1.04, every additional year in age increases the odds of angioplasty denial by 4%, indicating that older patients are more likely to be denied angioplasty. This effect is statistically significant ($p = 0.004$). Furthermore, being

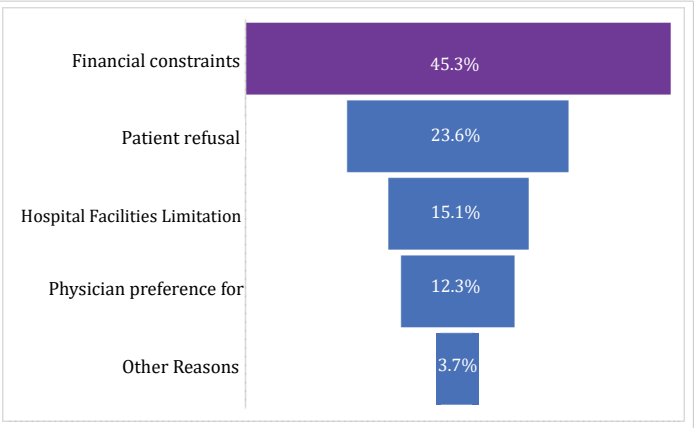

Figure 2: Major causes of angioplasty denial.

Table 4: Independent factor contributing to angioplasty denial.

Variable	Odds ratio	95% Confidence interval	*p* - value
Age (years)	1.04	1.01 - 1.07	0.004
Male gender	0.89	0.53 - 1.48	0.638
Low income (< $100/month)	2.94	1.78 - 4.85	< 0.001
Rural residence	3.12	1.85 - 5.27	< 0.001
Illiteracy	2.45	1.39 - 4.32	0.002
Comorbidities (≥ 2 diseases)	2.18	1.33 - 3.58	0.002
Hospital infrastructure issues	1.78	1.01 - 3.14	0.045
Patient refusal	3.65	2.09 - 6.36	< 0.001
Physician preference for conservative management	1.65	0.92 - 2.95	0.091

male slightly decreases the likelihood of denial (OR = 0.89), but this effect is not statistically significant ($p = 0.638$). Meanwhile, patients with a monthly income below $100 are almost three times more likely to be denied angioplasty compared to higher-income patients (OR = 2.94, $p < 0.001$). On the other hand, Rural patients have more than three times higher odds of being denied angioplasty compared to urban patients (OR = 3.12, $p < 0.001$). In fact, illiterate patients are more than twice as likely to be denied angioplasty compared to literate patients (OR = 2.45, $p = 0.002$). Furthermore, patients with two or more comorbidities are twice as likely to be denied angioplasty (OR = 2.18, $p = 0.002$). In addition, patients treated at hospitals with limited facilities are 1.78 times more likely to be denied angioplasty (OR = 1.78, $p < 0.045$). And finally, patients who refused the procedure due to personal or cultural reasons had 3.65 times higher odds of being denied angioplasty ($p < 0.001$).

Discussion

The findings of this study offer important insights into the underlying reasons for the denial of coronary angioplasty in patients with significant Coronary Artery Disease (CAD) in Afghanistan. The results indicate that financial constraints, limited healthcare infrastructure, patient refusal, and physician preference for conservative management are key contributors to angioplasty denial. These factors align with existing literature on barriers to advanced cardiovascular care in low - and middle-income countries (LMICs), but also

underscore some unique challenges faced by the Afghan healthcare system. In fact, patient refusal was comparatively higher in illiterate patients or their attendants i.e. most patients or their attendants believed the disease would go away itself or with medical management.

Financial barriers were the most common reason for angioplasty denial, affecting 45.3% of the patients in the case group. This finding is consistent with other studies conducted in LMICs, where out-of-pocket healthcare costs are a significant burden due to the lack of insurance coverage and government support for expensive procedures [4,5]. In Afghanistan, the economic landscape is particularly bleak, with many families living on less than $100 per month [8]. In this study, 62.4% of low-income patients were denied angioplasty, highlighting the disparity in access to healthcare based on economic status.

The implications of this finding are far-reaching. Without affordable healthcare options, many patients with CAD may not receive the life-saving interventions they need, leading to higher mortality and morbidity rates. Expanding access to insurance coverage and implementing government-subsidized healthcare programs for low-income patients should be a priority for policy makers in Afghanistan. Evidence from other LMICs suggests that even modest financial assistance programs can significantly improve access to advanced medical care [6].

Patient refusal accounted for 23.6% of angioplasty denials, driven largely by cultural beliefs, fear of the procedure, and mistrust in the healthcare system. This is consistent with findings from other studies conducted in South Asia and the Middle East, where cultural and religious beliefs can influence medical decision-making [9]. In Afghanistan, familial and community influence often play a major role in healthcare decisions, especially among less-educated patients [1]. In our study, 46.2% of patients denied angioplasty were illiterate, indicating a strong correlation between educational attainment and the likelihood of refusing medical intervention.

Addressing these cultural barriers will require more than just improving healthcare infrastructure. Public health education campaigns that promote the benefits of modern medical procedures, such as coronary angioplasty, are needed. These campaigns should be tailored to specific communities and involve trusted local figures to improve their efficacy. In addition, healthcare providers need to engage in more effective patient education, explaining the risks and benefits of the procedure to help alleviate fears [8].

Limited hospital facilities were the third most common reason for angioplasty denial, accounting for 15.1% of cases. This is a common challenge in developing countries where medical infrastructure is often underdeveloped [2]. Rural areas, in particular, are underserved in Afghanistan, with only a handful of hospitals capable of performing advanced procedures like angioplasty [10]. In this study, patients from rural regions were disproportionately affected by hospital resource shortages, further compounding the access gap between urban and rural populations.

Previous studies in similar settings have shown that improving medical infrastructure and investing in specialized cardiac care centers can reduce mortality from CAD and other cardiovascular diseases [11]. For Afghanistan, increasing the number of hospitals with interventional cardiology departments and ensuring adequate training for healthcare professionals should be part of the country's long-term healthcare strategy. Mobile medical units or partnerships with international organizations could help bridge the gap in rural areas [4].

The study found that 12.3% of patients were denied angioplasty due to physician preference for conservative management. This is likely a reflection of concerns over patient risk factors such as age, comorbidities, and overall prognosis. Similar findings have been reported in other low-resource settings, where physicians may be more cautious due to the lack of advanced medical support and the potential complications of invasive procedures [6].

The results of this study are consistent with findings from similar studies conducted in other LMICs. For example, Trani, et al. [4] found that financial barriers and inadequate healthcare infrastructure were the primary reasons for angioplasty denial in several developing countries. Similarly, Jones-Rasmussen [5] reported that cultural beliefs and patient refusal were significant obstacles to care in South Asia and the Middle East. However, our study adds to the existing literature by providing specific data on Afghanistan, a country that faces unique challenges due to ongoing conflict, political instability, and widespread poverty [8].

The findings of this study have several important implications for healthcare policy and practice in Afghanistan. First, there is an urgent need for policies that improve access to healthcare for low-income populations. This includes expanding insurance coverage and providing government subsidies for expensive procedures like coronary angioplasty. Second, improving healthcare infrastructure, particularly in rural areas, is critical to ensuring that all patients have access to advanced medical care. Third, public health education campaigns that address cultural beliefs and promote modern medical interventions should be implemented to reduce the rates of patient refusal.

For healthcare providers, the study emphasizes the importance of patient education and shared decision-making. Physicians should take the time to explain the risks and benefits of angioplasty to their patients and ensure that decisions are made based on medical evidence rather than cultural or financial pressures.

This study has several limitations. First, it was conducted at tertiary care centers, which may not fully represent the experiences of patients treated at smaller, rural hospitals. Second, the study relied on self-reported data for some variables, such as income and reasons for refusal, which may be subject to bias. Third, the lack of longitudinal follow-up data limits our understanding of the long-term outcomes of patients who were denied angioplasty. Future research should focus on tracking these patients over time to determine whether conservative management or other interventions were effective in reducing CAD-related morbidity and mortality.

Conclusion

Financial and infrastructural barriers are the leading causes of coronary angioplasty denial in Afghanistan, exacerbating disparities in healthcare access, particularly among low-income and rural patients. Addressing these issues through policy reforms, improved healthcare infrastructure, and targeted public health education is essential to reducing CAD-related morbidity and mortality in the country.

Acknowledgment

The authors express their gratitude to the management of Afghan Momand Medical Complex and the participants in facilitating the research work. We also acknowledge the use of artificial intelligence in preparing the template of the article.

References

1. Khoja A, Andraweera PH, Lassi ZS, Zheng M, Pathirana MM, Ali A, et al. Risk factors for premature coronary artery disease (PCAD) in adults: a systematic review protocol. F1000Res. 2021;10:1228. Available from: https://doi.org/10.12688/f1000research.74926.1
2. Oyatani K, Koyama M, Himuro N, Miura T, Ohnishi H. Characterization of prehospital time delay in primary percutaneous coronary intervention for acute myocardial infarction: analysis of geographical infrastructure-dependent and-independent components. Int J Health Geogr. 2023;22(1):7. Available from: https://doi.org/10.1186/s12942-023-00328-5
3. Shams A, Ibrahimi I, Ahmadzai H. Awareness of Myocardial Infarction in Nangarhar Residents: A Community Based Study. J Cardiol Cardiovasc Med. 2024;9(2):130-134. Available from: https://doi.org/10.29328/journal.jccm.1001193
4. Trani JF, Bakhshi P, Noor AA, Lopez D, Mashkoor A. Poverty, vulnerability, and provision of healthcare in Afghanistan. Soc Sci Med. 2010;70(11):1745-1755. Available from: https://doi.org/10.1016/j.socscimed.2010.02.007
5. Jones-Rasmussen DM. Stress and Coping in a Global Health Crisis: A Systematic Literature Review [dissertation]. California Southern University; 2022. Available from: https://www.proquest.com/openview/a8d9a86243c11fc93ee11fb322ac16c7/1?pq-origsite=gscholar&cbl=18750&diss=y
6. Henao López V, Triviño Vargas Z. Adherence to Secondary Prevention and Influential Factors in Individuals with Coronary Angioplasty. Investig Educ Enferm. 2020;38(3). Available from: https://doi.org/10.17533/udea.iee.v38n3e05
7. Tonino PA, Fearon WF, De Bruyne B, Oldroyd KG, Leesar MA, Ver Lee PN, et al. Angiographic versus functional severity of coronary artery stenoses in the FAME study: fractional flow reserve versus angiography in multivessel evaluation. J Am Coll Cardiol. 2010;55(25):2816-2821. Available from: https://doi.org/10.1016/j.jacc.2009.11.096
8. Bove V, Gavrilova E. Income and Livelihoods in the War in Afghanistan. World Dev. 2014;60:113-131. Available from: https://econpapers.repec.org/article/eeewdevel/v_3a60_3ay_3a2014_3ai_3ac_3ap_3a113-131.htm
9. Przybojewski JZ, Weich HF. Percutaneous transluminal coronary angioplasty. A review of the literature. S Afr Med J. 1984 Jan 25;Spec No:1-22. Available from: https://pubmed.ncbi.nlm.nih.gov/6229887/
10. UNDP Afghanistan. Afghanistan rural population report. United Nations Development Program; 2022. Available from: https://www.undp.org/afghanistan/publications/undp-afghanistan-2022-numbers
11. Lundberg GP, Mehta LS, Volgman AS. Specialized care for women: the impact of women's heart centers. Curr Treat Options Cardiovasc Med. 2018;20(9):76. Available from: https://doi.org/10.1007/s11936-018-0656-5