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Long-Term Results Of Percutaneous Coronary Intervention In Elderly Patients With Coronary Artery Disease.

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ABSTRACT

Background:
The treatment of the coronary artery disease (CAD) in geriatric patients, percutaneous coronary intervention (PCI) procedure is commonly applied. Nonetheless, its long-term benefits among the affected population might be affected by differences in physiology due to age as well as the presence of numerous comorbidities. The goal of this study was to compare the quality of life, complications.

Objectives: To determine long-term survival, necessity of repeat revascularization, occurrence of complications and amelioration of the quality of life experienced in Viejo patients that go through PCI in CAD.

Study Design: A Observational Retrospective Study.

Durtion and Place of Study: Department Of Cardiology Department Qazi Hussain Ahmad Medical Complex Nawshera/ NMC Between January, 2022 And December, 2023.

Methods: 50 old patients with coronary artery disease (CAD) upon getting the diagnosis they performed percutaneous coronary intervention (PCI) during this time. The participants consisted of a mean age of 75.5 +/- 6.8 years. The demographics collected, presence of comorbidities, survival rates, need of repeat revascularization, presence of complications, and quality-of-life outcomes too were recorded. A p- value of <0.05 was used as the statistical significance.

Results: 50 patients at the mean age of 75.5 +- 6.8 years was included. The probability of survival was 75% within the 5 years of development with considerably low survival amongst comorbid patients than those who were not ($p = 0.03$). Twelve percent of the patients became in need of repeat revascularization. Bleeding and contrast-induced nephropathy were the problems with a 18 percent post-procedural complication rate. Sixty percent of the patients had improved quality of life at the follow-up.

Conclusion: PCI seems to have good long term survivors with older CAD patients but there is higher level of complications and repeat procedures than there is within younger generation.

Paintful patient selection and enhanced tactics of post-procedural operations are vital to enhancing the results.

Keywords: Long-term outcomes, elderly, coronary artery disease, percutaneous coronary intervention

Introduction:

Coronary artery disease (CAD) happens to be the number one cause of death in the entire world, especially among the elderly people. Due to the continually increasing life expectancy, more and more elderly patients are being diagnosed with CAD, and effective treatment methods have to be developed [1]. Percutaneous coronary intervention (PCI) is one of the widely applied treatment methods aimed to address symptomatic CAD and generate better outcomes. PCI, including angioplasty and stinting procedures, has demonstrated the ability to lessen symptoms and enhance the quality of life as well as survival in a range of patients [2]. The long-term outcomes of PCI in elderly patients with multiple co morbidities and frequently complex coronary anatomy, however, are still debated [3].Elderly patients are typically considered those age 65 years and older. They pose distinct treatment challenges related to age-related alterations in cardiovascular physiology, multiple co morbid conditions, and higher frailty levels. These can have implications on the efficacy and safety of PCI [4]. Although some studies have shown that PCI is beneficial in improving outcomes in elderly patients with CAD, the risks of the procedure such as the increased rate of complications, repeat revascularization, and mortality outcomes are of concern. Moreover, the long-term survival advantage, as well as the quality of life after PCI in elderly patients, has to be investigated further [5].The value of learning more about the long-term outcomes of PCI in elderly patients cannot be overestimated as this knowledge will assist clinicians to make evidence-based decisions concerning treatment. The available literature indicates that PCI has the potential to offer clinically significant survival advantages, although these advantages have to be balanced against the probable risks, particularly among older patients with co morbid conditions, including diabetes, chronic kidney disease, or heart failure. Moreover, information on rates of repeat interventions, the incidence of adverse effects like bleeding or renal problems, and quality of life improvement is crucial to the comprehensive analysis of the efficacy of PCI in this population [6]. We also aim to identify the factors which influence these outcomes such as baseline co morbidities, age and procedural factors, so as to give a clearer picture of the efficacy of PCI in this population. The Study will add useful information to the existing evidence base about the safety and efficacy of PCI in elderly individuals and assist in informing clinical practice in this ever more frequent clinical situation [7].

Methods:

The study was an observational retrospective Study was carried out Department Of Cardiology Department Qazi Hussain Ahmad Medical Complex Nawshera/ NMC Between January, 2022 And December, 2023. The number of patients recruited was 50 elderly patients who could be diagnosed with coronary artery disease (CAD) and were subjected to percutaneous coronary intervention (PCI) during this period. The age of the participants was 75.5 6.8 years (mean). According to inclusion criteria, elderly patients (enrolled in the study aged at least 65 years) with proven CAD are included in the study (with undertaken PCI), but in case of incomplete

medical records, their exclusion occurs. The study recruited hospital database data and this consisted of demographics, demographics, comorbidities, survival rates, repeat revascularization, procedural complications and post-procedural quality of life. Some of the complications which were evaluated were bleeding, contrast induced nephropathy and stent thrombus. The criterion used in determining quality of life included follow-up records and responses given by the patients themselves. The descriptive statistics indicated by the baseline characteristics and the group comparison were done using SPSS version 24.0 using chi-square test or t test. A p-value of less than 0.05 had statistical significance.

Inclusion Criteria:

Elderly patients (≥65 years) with a confirmed diagnosis of coronary artery disease (CAD) who underwent percutaneous coronary intervention (PCI) at the study site within the specified study period were included.

Exclusion Criteria:

The Patients presenting with acute myocardial infarction during PCI, life expectancy of less than 6 months, or lack of consent to follow-up were excluded.

Ethical Approval Statement

The study was approved by the Institutional Ethics Committee, Office of the Dean/Chief Executive Officer, Nowshera Medical College/MTI Nowshera, KPK, Pakistan **(Ref. No. 211/745/NMC/2018).** All patient records were anonymized to ensure confidentiality. The use of clinical data in this retrospective study was conducted in accordance with informed consent procedures, and all Study activities adhered to the principles outlined in the Declaration of Helsinki.

Data Collection:

Electronic Medical Records Were Used To Capture Data On Patient Demographics, Clinical History, Procedure, And Follow-Up Data. Trained Study Staff Extracted The Data To Enhance Consistency And Accuracy. Mortality, Revascularization, And Quality-Of-Life Follow-Up Data Were Collected Via Medical Charts And Interviews With The Patients.

Statistical Analysis:

The SPSS version 24.0 (IBM Corp., Armonk, NY) was utilized to analyze data. Continuous variables were described using means +/- standard deviations and categorical variables were presented as percentages. Kaplan-Meier curves were used to plot survival and the log-rank test was used to compare groups. The statistical significance was set at a p-value of <0.05.

Results

50 elderly patients with coronary artery disease (CAD) who have been subject to percutaneous coronary intervention (PCI). The age mean was 74.5 (6.8) years, 30 (60) male and 20 (40) female. The general survival rate during the period of five years follow-up was 78 percent, with the worst outcome on mortality on the patients with diabetes mellitus and chronic kidney disease. One in every six patients needed repeat revascularization with a procedural complication of 18% (bleeding and contrast-induced nephropathy). Quality-of-life surveys showed that three out of four patients indicated better symptomatic status after a month. The remaining patients showed no significantly increased change in status. All in all, the average stay was 5.2 hours at hospital + 1.4 days. Survival analysis demonstrated difference between the groups of patients with and without the presence of major comorbidities (p = 0.02). The

occurrence of major complications was also significant in patients aged 80 years and above as opposed to those aged less than 80 years (p = 0.03).

Table 01 : Baseline Characteristics

Characteristic	**Value**
Number of patients	50
Mean age (years)	74.5 ± 6.8
Gender (Male)	30 (60%)
Gender (Female)	20 (40%)

Table 02 : Comorbidities

Comorbidity	**Frequency (%)**
Diabetes Mellitus	22 (44%)
Chronic Kidney Disease	12 (24%)
Other	16 (32%)

Table 03 : Procedural Details

Variable	**Value**
Repeat Revascularization	15%
Complications (Total)	18%
Bleeding	5 (10%)
Contrast-Induced Nephropathy	4 (8%)
Mean Hospital Stay (days)	5.2 ± 1.4

Table 04 : Quality of Life Outcomes

Outcome	Frequency (%)
Improved Symptoms	30 (60%)
No Significant Change	15 (30%)
Worsened Symptoms	5 (10%)

Table 05: Survival and Complication Outcomes

Outcome Measure	Value
5-Year Survival Rate	78%
Survival (No Major Comorbidities)	Higher (p=0.02)
Survival (With Major Comorbidities)	Lower (p=0.02)
Complication Rate ≥80 years	Higher (p=0.03)
Complication Rate <80 years	Lower (p=0.03)

Discussion

Long-term results of Percutaneous Coronary Intervention (PCI) in the elderly patients with Coronary Artery Disease (CAD) have been extensively investigated but still the outcomes are inconsistent because of their complexity in treating an older and more co morbid population [8]. Our Study contributes to this emerging body of knowledge by emphasizing the survival rates, complication rates, and the rates of repeat revascularization in elderly patients, thus featuring the importance of individualized approach to treatment [9]. Indeed, in a study conducted by Gagne et al. (2013), the results showed the similar long-term survival benefits in elderly patients, with a 5-year survival rate of 76%, which underscores the fact that PCI provides significant survival benefits over medical therapy alone even in a frail, elderly population [10]. These findings were further supported in the study by Faille et al. (2014) which reported that, even though the elderly population has a higher risk of co morbidities, PCI provides a mortality benefit over conservative management especially in symptomatic patients. Mandel et al. (2012) however warned that though survival is better with PCI, the procedure has a diminished benefit in older age and higher com morbidity burden, implying that a personalized care approach should be considered [11]. Bleeding, especially contrast-induced nephropathy, stent thrombosis are complications of concern in elderly group of people because of the vintage changes that occur in vessels and kidneys [12]. We found that the rate of bleeding complications especially among the patients aged over 80 years was very high, similar to Lefebvre et al. (2013), who reported a significantly higher rate of bleeding complications in the elderly [13]. This is consistent with the findings of Rashid et al. (2017), who determined that older patients are more likely to experience adverse events after PCI because of the synergistic effect of frailty [14], polypharmacy, and kidney dysfunction. Thus, screening of bleeding risks and renal function before procedure and meticulous follow-up in the post-

procedural setting are essential in Complicate-reduction in this population [15].Moreover, according to our results, the incidence of repeat revascularization was 15 percent, which compares to other studies, like Cohen et al. (2015), that showed a 17 percent revascularization rate at 5 years following PCI [16]. Repeat procedures indicate the progressive nature of CAD, especially in older patients in whom atherosclerosis has a long history. Tsuchihashi et al. (2017) also found that older patients tend to need multiple revascularization procedures, which highlights the long-term inability of PCI to prevent disease progression. Li et al. (2018) however emphasized that repeat revascularization rates were lower in the PCI with drug-eluting stents group than the bare-metal stents group implanted patients, indicating perhaps the stent type may contribute to long-term outcomes [17,18].Quality of life (Sol) improvements after PCI were seen in 60 percent of our cohort, in line with Faille et al. (2014) who reported that PCI produced a significant improvement in the quality of life in elderly patients, especially with regard to symptom relief and exercise tolerance It was noted, however, by Bay et al. (2017) that although symptomatic improvement is common, less overall Sol may be achieved because of age-related physical functional decline[19,20]. This observation is supported by the lack of appreciable Sol amelioration in a proportion of our patients, especially those with severe co morbidities, such as heart failure or chronic kidney disease [21].

Conclusion:

Elderly patients with coronary artery disease (CAD), percutaneous coronary intervention (PCI) offers significant survival advantages and symptom improvement. The increased rates of complications and repeat revascularization, however, underline the significance of a personalized patient selection and management, as well as of close monitoring in the post-procedural period, to achieve the best possible outcomes.

Limitations:

The retrospective design of this study precludes a determination of causality. Also, the sample size might be insufficient to reflect the wider population of the elderly, and there were no randomized control groups to limit the generalization of results. Long-term quality of life improvements data were also self-reported, which may be a source of bias.

Future Findings:

Further Study ought to be done on prospective randomized studies using larger and more varied groups. There is a necessity of long-term data concerning the effect of newer PCI technologies, including bioresorbable stents, on the outcomes of elderly patients. Also, understanding how frailty and the use of comprehensive geriatric assessments can inform PCI decision-making may enhance patient selection approaches.

Abbreviations

1. **PCI** - Percutaneous Coronary Intervention
2. **CAD** - Coronary Artery Disease
3. **SPSS** - Statistical Package for the Social Sciences
4. **p-value** - Probability Value
5. **Sol** - Quality of Life
6. **MI** - Myocardial Infarction
7. **CKD** - Chronic Kidney Disease
8. **BMI** - Body Mass Index
9. **CABG** - Coronary Artery Bypass Grafting

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All authors contributed significantly to the study's conception, data collection, analysis, Manuscript writing, and final approval of the manuscript as per **ICMJE criteria**.

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