

Coronary Artery Disease in Octogenarians: A Comparative Analysis of Individuals with and without the Condition



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Abstract

Background: Coronary artery disease (CAD) presents a significant risk for octogenarians, with a prevalence higher than that in the general population. This study aimed to evaluate the baseline characteristics and clinical outcomes of elderly individuals with and without CAD.

Methods: This retrospective cohort study included 251 participants aged 80 and older, divided into those with CAD (n = 221, 88%) and those without CAD (n = 30, 12%). Demographic, clinical, laboratory, and angiographic data were collected, with follow-up lasting up to 1000 days.

Results: The mean age was 83.9 years (± 3.4), with no significant age difference between groups ($p = 0.198$). Participants with CAD showed a significantly higher prevalence of diabetes mellitus, hypertension, hyperlipidemia, chronic kidney disease, and left ventricular systolic dysfunction ($p = 0.003$, $p = 0.027$, $p = 0.000$, $p = 0.001$, $p = 0.000$). In contrast, those without CAD reported higher dairy consumption, lower fast food intake, and greater physical activity ($p = 0.000$, $p = 0.000$, $p = 0.009$). Male sex reduced mortality odds by 50% (Odds Ratio [OR] = 0.5, $p < 0.001$), while diabetes nearly doubled the odds (OR = 1.9, $p < 0.001$). Comorbidities emerged as a strong predictor (OR = 21.4, $p = 0.000$), and the absence of CAD correlated with lower mortality risk (OR = 0.6, $p = 0.051$). Cox regression confirmed male sex (Hazard Ratio [HR] = 0.6, $p = 0.013$) and diabetes (HR = 2.6, $p < 0.001$) as significant mortality predictors.

Conclusion: This study highlights the considerable burden of cardiovascular risk factors and comorbidities in octogenarians with CAD, emphasizing the need for a comprehensive, patient-centered management approach for this vulnerable population.

Keywords: Coronary artery disease; Octogenarians; Risk factors; Mortality

Introduction

Coronary Artery Disease (CAD) represents a significant and increasingly critical health challenge for octogenarians defined as individuals aged 80 years and older. Reports indicate that the Iranian population is aging, a trend that presents significant challenges for public health and healthcare systems. As life expectancy increases, there is a growing prevalence of age-related diseases, including chronic conditions such as cardiovascular diseases and diabetes, underscoring the necessity for a comprehensive understanding of CAD within this rapidly expanding demographic segment. Given the aging global population, particularly in developing nations, the implications of CAD in older adults warrant urgent attention from healthcare providers and policymakers alike. Advancing age is widely recognized as a principal risk factor for CAD; however, the prevalence of this disease in octogenarians is markedly higher than in younger cohorts. Current literature indicates that a

substantial proportion of elderly men, with estimates reaching up to 70% [1-3], and women, with figures approaching 50% [4], may present with varying degrees of coronary artery stenosis. This elevated prevalence not only highlights the vulnerability of this age group but also reflects the complex interplay of age-related physiological changes, comorbid conditions, and lifestyle factors that contribute to the development and progression of CAD.

The ramifications of CAD in octogenarians extend beyond individual health concerns, as this demographic accounts for a disproportionately high burden on healthcare resources. Hospitalization rates due to myocardial infarction and its associated complications are significantly elevated among octogenarians, contributing to heightened mortality rates [5]. This necessitates an urgent reevaluation of healthcare strategies and resource allocation to address the unique needs of this population.

A nuanced understanding of the distinct characteristics of CAD in octogenarians is essential for optimizing both diagnostic and therapeutic approaches. Implementing a patient-centered care model that prioritizes the specific health profiles and preferences of elderly patients can lead to improved health outcomes and enhanced quality of life [6-8]. Consequently, the primary objective of this investigation was to thoroughly characterize CAD in patients aged 80 years and older. Additionally, this study aimed to conduct a comparative analysis of octogenarians with CAD against those without, to identify potential risk factors and assess mortality rates associated with this condition. By elucidating these aspects, this research seeks to contribute valuable insights into the management of CAD in an increasingly prevalent age group, ultimately informing clinical practices and health policies aimed at improving the care of elderly patients.

Methods

This retrospective cohort study was conducted at Afshar Hospital, a tertiary care medical center in Yazd, Iran. The study included all patients aged 80 years and older who were admitted with suspected coronary artery disease (CAD) between January 2018 and December 2022 and subsequently underwent coronary angiography. Patients with uninterpretable coronary angiography results and those who declined participation were excluded from the analysis.

Sample Size Determination

In our study, we calculated the sample size required to detect a prevalence of normal coronary arteries in octogenarians, assuming a 10% prevalence rate. Using the formula:

$$n = Z^2 \cdot p \cdot (1 - p) / e^2$$

Where (Z) is the Z-score corresponding to the desired confidence level (1.96 for 95% confidence), (p) is the assumed prevalence of the condition (0.10), and (e) is the margin of error (0.05), we determined a sample size of approximately 139. Adjusting for a 10% dropout rate, the required sample size increased to 155. A sensitivity analysis revealed that with a prevalence of 5%, the sample size would be 75 (adjusted to 83), while at 15%, it would be 189 (adjusted to 210). Our actual sample size of 251 cases exceeded the calculated requirements, providing robustness to our findings.

Data Collection and Analysis

Data collection

Data collection was performed through a comprehensive examination of patient medical records and in-person interviews. The collected data included demographic details, medical history, physical activity levels, and dietary patterns. Dietary data were obtained through self-reported questionnaires. Physical activity assessment was conducted through self-reporting using a designed questionnaire. Coronary angiograms were independently evaluated by two experienced cardiologists, with the presence of CAD defined based on findings from coronary

angiography, specifically considering stenosis of more than 20% in the coronary arteries as indicative of CAD.

Statistical Analysis

Statistical analyses were performed utilizing SPSS version 26 (IBM Inc., NJ, USA). The following analyses were employed:

Descriptive Statistics

Continuous variables, such as age and dietary habits, were represented as means and standard deviations. Categorical variables, including gender, medical history, and family history of heart disease, were presented as frequencies and percentages.

Assessment of Baseline Characteristics

To assess potential disparities in baseline characteristics between octogenarians with normal coronary arteries and those with abnormal coronary arteries, continuous variables were analyzed using the independent t-test, while categorical variables were examined with the chi-square test and Fisher's exact test. This comparative analysis aimed to identify statistically significant differences in demographic factors, medical history, physical activity levels, and dietary patterns between the two groups.

Mortality and Survival Analysis

Mortality rates and causes of death were investigated over a 1000-day follow-up period. Survival analysis was performed employing both Cox proportional hazards regression and Kaplan-Meier methods. The Cox regression model aimed to ascertain independent predictors of mortality, quantifying their influence through hazard ratios. We adjusted for confounding factors by using multivariate regression analysis, which allowed us to isolate the effect of the primary independent variable on the outcome while accounting for the influence of other variables. Additionally, we included stratification analyses to assess the interaction effects of these confounders, analyzing subgroups based on socioeconomic status to evaluate how this factor modified the relationship between CAD and our primary variables of interest.

Handling Missing Data

In our study, we encountered missing data due to various reasons, including incomplete responses during patient interviews and missing medical records. To address this, we employed multiple imputations as our primary method for handling missing data. By utilizing multiple imputations, we aimed to minimize bias and increase the robustness of our findings, allowing us to retain a larger sample size for analysis and enhancing the generalizability of our results.

Statistical Significance

For all statistical analyses conducted in this study, a p-value of ≤ 0.05 was deemed to indicate statistical significance. By incorporating these advanced statistical techniques, we aimed to enhance the rigor of our analysis and provide a more comprehensive understanding of the factors influencing CAD in

octogenarians.

Results

The study included a total of 251 participants, among whom 30 (12.0%) were classified as having no coronary artery disease (No CAD), based on normal or near-normal coronary angiography.

The remaining 221 participants were diagnosed with CAD, comprising 20 (7.9%) with left main disease, 60 (23.9%) with single-vessel disease, 52 (20.7%) with double-vessel disease, and 89 (35.5%) with triple-vessel disease. Key findings are detailed below (Table 1).

Table 1: Comparison of Characteristics Between Octogenarians with and Without Coronary Artery Disease (CAD).

Parameter	Total (N=251)	No CAD (N=30)	CAD (N=221)	P value
Age (yr)	83.9 ± 3.4	84.7 ± 3.7	83.8 ± 3.4	0.198
Sex (n, %)				
-Male	145(57.8)	16(53.3)	(58.4) 129	.0596
-Female	106(42.2)	14(46.7)	92(41.6)	0.596
Number of children (n, %)	6.4 ± 2.6	5.9±2.6	6.5± 2.6	0.287

Table 1: Comparison of Characteristics Between Octogenarians with and Without Coronary Artery Disease (CAD).

Number of parity (n, %)	8.3 ± 3.3	±8.8 2.8	8.2 3.4 ±	0.392
Job (n, %)				
-Employee	19(7.6)	1(3.3)	18(8.1)	0.289
-Farmer	88(35.1)	56(61.7)	71(32.1)	0.026
-Housewife	69(27.5)	6(20.0)	63(28.5)	0.191
-Worker	53(21.1)	6(20.0)	21.347(	0.661
Income (n, %)				
-Low or moderate (<200\$)	129(51.4)	19(63.3)	110(49.8)	0.166
-High (≥200\$)	90(35.9)	11(36.7)	79(35.7)	0.915
Family support (n, %)	199(79.2)	(90.0)27	(77.8)172	0.122
Dietary habits	132(52.6)	(53.3)16(	52.5)116(	935.0
-Salt intake	89(35.4)	1(60.0)8	(32.1)71	0.150
Low(n, %)				
-Vegetables & fruits consumption	1.7 ± 2.6	2.8 2.0 ±	2.6 ± 1.6	0.730
Moderate and high (n, %)				
-Red meat consumption per week (mean ± SD)	1.7 ± 2.9	3.4 ± 2.0	2.9± 1.7	0.108
-White meat consumption per week (mean ± SD)				
-Egg consumption per week (mean ± SD)	1.4 ± 2.2	2.4 1.6 ±	1.4 2.1±	0.333
-Dairy products consumption per day (n, %)				
-Fast food consumption No or infrequent (n, %)	0.6±1.4	1.9 ± 0.7	1.3±0.6	0.000
	166(66.1)	93.328(	66.9)148(	.0000
Physical activity (n, %)				
-Low	137(54.6)	46.6)14(	55.6)123(	0.353
-Moderate	38(15.1)	23.37(	14.031(	0.251
-High	9(3.5)	(12.5) 3	2.76(	0.009
Hx of CAD Risk factors (n, %)				
-DM	84(36.2)	4(13.3)	80(39.6)	0.003
-HTN	155(67.4)	15(00.5)	140(70.0)	0.027
-HLP	110(43.8)	5(16.7)	105(47.5)	0.000
-FH of CAD	25(10.9)	0(0.0)	18(9.3)	0.066
-Tobacco smoking	18(8.1)	2(6.7)	(11.5)23	0.335
-Opium addiction	16(7.0)	13.3)4	12(%6.0)	0.139
BMI (kg/m ²)	24.2 ± 3.7	23.2 ± 3.1	24.4 ± 3.8	0.103

Table 1: Comparison of Characteristics Between Octogenarians with and Without Coronary Artery Disease (CAD)

Comorbidity (n, %)				
-CKD	57(23.9)	2(6.7)	55(26.4)	0.010
-COPD	45(19.5)	(26.7)8	(18.4)37	0.203
-CVA	25(10.9)	(6.7)2	(11.5)23	0.335
-Alzheimer disease	29(12.6)	(3.3)1	(14.0)28	0.079
-Chronic liver disease	3(1.3)	0(0.0)	3(1.5)	0.656
-PAD	31(13.8)	1(3.3)	30(13.6)	0.109

LVEF (mean ± SD)	41.6 ± 10.6	48.5 ± 8.7	40.6 ± 10.5	0.000
Lab tests (mean ± SD)				
-FBS	127.5 ± 60.4	99.6 ± 20.7	131.8 ± 63.4	0.020
-Total cholesterol	149.5 ± 42.3	156.1 ± 41.4	148.4 ± 42.5	0.489
-TG	116.9 ± 59.5	116.7 ± 64.0	116.9 ± 59.1	0.988
-LDL-c	88.8 ± 30.3	84.3 ± 34.3	89.4 ± 29.9	0.554
-HDL-c	46.1 ± 12.7	46.8 ± 12.0	46.1 ± 12.8	0.842
-Urea	47.5 ± 18.8	43.1 ± 10.1	48.2 ± 19.6	0.195
-sCr	1.3 ± 0.6	1.1 ± 0.3	1.4 ± 0.7	0.001
-Hb	13.6 ± 2.3	13.8 ± 1.5	13.6 ± 2.4	0.719
Death (n, %)				
-In hospital	22(8.8)	0(0.0)	22(10.0)	0.07
-Follow up (1000 days)	45(18.0)	6(20.0)	39(18.0)	0.79
Cause of death (n, %)				
-Non cardiac	37(14.7)	5(16.7)	29(13.1)	0.616
-Cardiac	30(12)	1(3.3)	32(14.5)	0.894

Values are means ± standard deviations for continuous variables and percentages for categorical variables.

CAD: Coronary artery disease, Hx: History, DM: Diabetes mellitus, HTN: Hypertension, HLP: Dyslipidemia, FH of CAD: Family history of coronary artery disease-, BMI: Body mass index- kg/m²: Kilograms per square meter, CKD: Chronic kidney disease, COPD: Chronic obstructive pulmonary disease, CVA: Cerebrovascular accident (stroke), PAD: Peripheral artery disease, LVEF: Left ventricular ejection fraction, FBS: Fasting blood sugar- TG: Triglycerides, LDL-c: Low-density lipoprotein cholesterol, HDL-c: High-density lipoprotein cholesterol, sCr: serum Creatinine, Hb: Hemoglobin.

Demographics

The mean age of participants was 83.9 years (±3.4), with no statistically significant age difference between groups (No CAD: 84.7 ± 3.7; CAD: 83.8 ± 3.4, p = 0.198). The sex distribution was similar across groups, with males comprising 57.8% of the total cohort (p = 0.596).

Family and Social Factors

Participants reported an average of 6.4 children (±2.6) and a parity of 8.3 (±3.3), with no significant differences noted (p = 0.287 and p = 0.392, respectively). Job distribution varied significantly, with a higher prevalence of farming among the non-CAD group (p = 0.026). However, income levels did not differ significantly between the two groups (p = 0.166).

Dietary Habits

A significant difference was observed in fast food consumption, with 66.9% of patients with CAD consuming it infrequently or not at all, compared to 93.3% of those without CAD (p < 0.001). Additionally, differences in daily dairy consumption were noted. The mean weekly intake of red meat was 2.6 (±1.7), with no significant differences identified in other dietary parameters.

Physical Activity

Among participants, 54.6% reported low levels of physical activity, with significant differences in high activity levels (p = 0.009).

CAD Risk Factors

The prevalence of diabetes mellitus, hypertension, and hyperlipidemia was significantly higher in the CAD group (p =

0.003, p = 0.027, and p < 0.001, respectively).

Comorbidities and LVEF

The mean Body Mass Index (BMI) was 24.2 (±3.7), with no significant differences between groups (p = 0.103). LVEF was significantly lower in the CAD group (40.6 ± 10.5) compared to the No CAD group (48.5 ± 8.7, p = 0.000).

Laboratory Tests

Significant differences were observed in fasting blood sugar levels (p = 0.020) and serum creatinine levels (p = 0.001), while other laboratory values did not show significant differences.

Mortality

In-hospital mortality was recorded at 8.8%, with follow-up mortality at 18.0%. No significant differences in mortality rates were found between groups (p = 0.070 and p = 0.790).

Logistic Regression Analysis (Table 2)

The logistic regression analysis identified several significant predictors of mortality among octogenarians. Male sex was associated with a 50% reduction in the odds of mortality (Odds Ratio [OR] = 0.5, 95% Confidence Interval [CI]: 0.4-0.7, p < 0.001). Conversely, the presence of diabetes mellitus was associated with nearly a twofold increase in the odds of mortality (OR = 1.9, 95% CI: 1.3-2.6, p < 0.001). The absence of CAD approached significance, with an OR of 0.6 (95% CI: 0.4-1.0, p = 0.051), indicating a potential protective effect. An LVEF of less than 40% was associated with a 2.4-fold increase in the odds of mortality (OR = 2.4, 95% CI: 1.7-3.4, p < 0.001). Additionally, serum creatinine levels of 1.3 mg/dL or higher were linked to a 3.2-fold increased risk of mortality (OR

= 3.2, 95% CI: 2.2-4.6, $p < 0.001$). Comorbidities including Chronic Kidney Disease (CKD), Chronic Obstructive Pulmonary Disease (COPD), Cerebrovascular Accident (CVA), Alzheimer's disease,

Chronic liver disease, and Peripheral Artery Disease (PAD) emerged as the strongest predictor; with an OR of 21.4 (95% CI: 7.0-65.1, $p < 0.001$).

Table 2: Logistic Regression Analysis of Variables Associated with Mortality in Octogenarians.

Variable	B	SE	Odds ratio	95% CI Lower	95% CI Upper	P value
Sex(male)	-0.667	0.176	0.5	0.4	0.7	0
Diabetes mellitus	0.624	0.173	1.9	1.3	2.6	0
Absence of CAD	-0.481	0.246	0.6	0.4	1	0.051
LVEF (<40%)	0.866	0.176	2.4	1.7	3.4	0
Serum Cr (≥ 1.3 mg/dL)	1.157	0.193	3.2	2.2	4.6	0
Comorbidity*	3.063	0.568	21.4	7	65.1	0

CAD: Coronary artery disease, **LVEF:** Left ventricular ejection fraction, **Cr:** Creatinine * Comorbidity including chronic kidney disease (CKD), chronic obstructive pulmonary disease (COPD), Cerebrovascular accident (CVA), Alzheimer disease, Chronic liver disease and peripheral artery disease (PAD).

Cox Regression and Survival Analysis (Table 3, Figure 1)

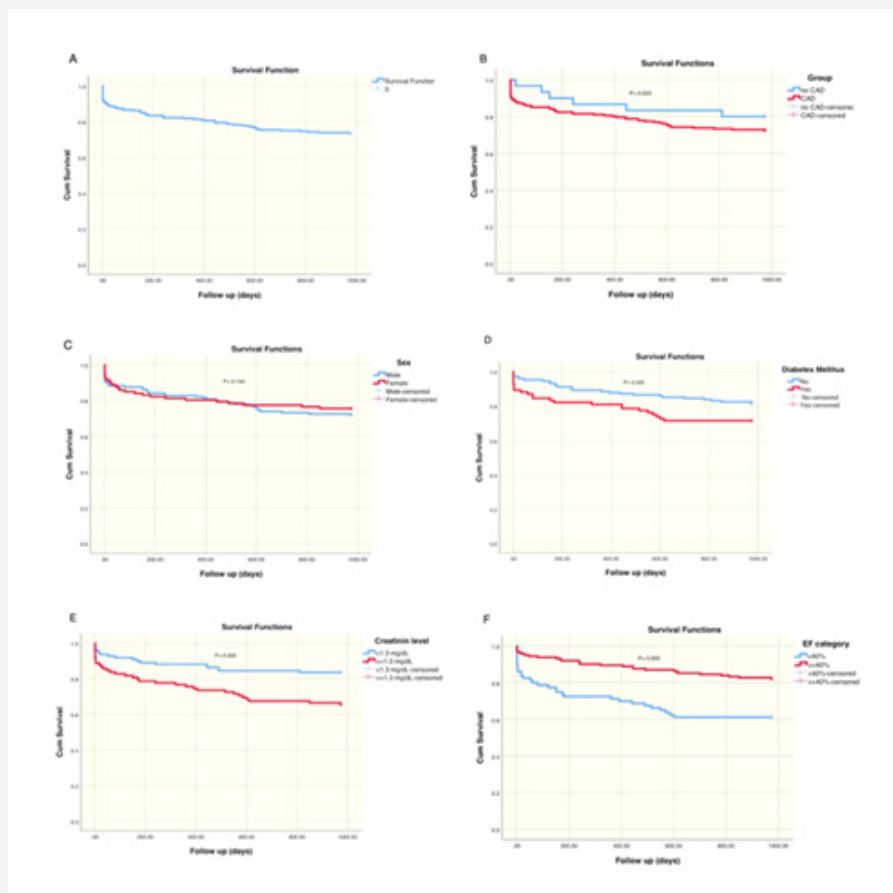


Figure 1: Kaplan-Meier survival curves illustrating survival functions for octogenarians. Panel A presents the overall survival function. Panel B compares survival outcomes between CAD-positive and CAD-negative groups. Panel C analyzes survival based on sex, while Panel D examines the impact of diabetes mellitus on survival probabilities. Panel E explores the association between creatinine levels and survival, and Panel F categorizes participants according to Left Ventricular Ejection Fraction (LVEF). Each panel highlights significant differences in survival probabilities over the follow-up period, underscoring the multifactorial influences on survival in this population.

The Cox regression analysis corroborated many of the findings from the logistic model. Male sex remained a significant predictor of reduced mortality risk (Hazard Ratio [HR] = 0.6, 95% CI: 0.4-0.9, p = 0.013). The presence of diabetes mellitus was associated with a 2.6-fold increase in the hazard of mortality (HR = 2.6, 95% CI: 1.8-3.9, p < 0.001). The absence of CAD significantly reduced the risk of mortality (HR = 0.2, 95% CI: 0.1-0.4, p < 0.001). An LVEF of less than 40% was linked to a 2.7-fold increase in mortality risk

(HR = 2.7, 95% CI: 1.8-4.2, p < 0.001). Similarly, serum creatinine levels ≥ 1.3 mg/dL were associated with a hazard ratio of 3.2 (95% CI: 2.0-5.1, p < 0.001). Kaplan-Meier survival analysis revealed significant differences in mortality associated with various factors, including the presence of CAD, diabetes mellitus, lower LVEF, and elevated serum creatinine levels (see Figure 1). However, sex did not demonstrate a significant difference in mortality during the mean follow-up period of 773 days (± 9.3 days).

Table 3: Cox Regression Analysis of Variables Associated with Mortality in Octogenarians.

	B	SE	Hazard ratio	95% CI Lower	95% CI Upper	P value
Sex (male)	-0.500	0.202	0.6	0.4	0.9	0.013
Diabetes mellitus	0.967	0.204	2.6	1.8	3.9	0.000
Absence of CAD	-1.458	0.306	0.2	0.1	0.4	0.000
LVEF (<40%)	1.011	0.221	2.7	1.8	4.2	0.000
Serum Cr (≥ 1.3 mg/dL)	1.170	0.239	3.2	2	5.1	0.000

CAD: Coronary artery disease, **LVEF:** Left ventricular ejection fraction, **Cr:** Creatinine

Discussion

This retrospective cohort study provides a comprehensive analysis of demographic, clinical, and lifestyle factors in elderly individuals, with a specific focus on differentiating those with and without Coronary Artery Disease (CAD). The findings offer valuable insights into the prevalence of CAD and its associated mortality rates among octogenarians, contributing significantly to the field of geriatric cardiology. The mean age of our cohort (83.9 years) and a slight male predominance (57.8%) align with existing literature on elderly populations with CAD. Previous studies have reported a higher prevalence of CAD in elderly men [3,9,10]. Furthermore, the educational background of our participants, with a majority having only primary education or being illiterate, mirrors the findings of other research, suggesting a correlation between lower educational attainment and increased CAD prevalence, potentially due to limited health literacy and decreased access to healthcare [11,12]. Dietary habits differed notably between the two groups in our study. Participants without CAD reported healthier dietary patterns, including a higher prevalence of low salt intake and increased consumption of fruits and vegetables. These findings are consistent with the PREDIMED study, which demonstrated the protective effects of a Mediterranean diet rich in fruits and vegetables against cardiovascular diseases [13]. Additionally, daily dairy consumption was significantly higher in the group without CAD, supporting the potential cardioprotective role of dairy products [14].

Physical activity levels were predominantly low among study participants. Notably, high physical activity was significantly more prevalent in the Noncoronary Artery Disease (CAD) group. This observation is consistent with the findings of Barbiellini et al. [15] which underscored the protective effect of physical

activity in mitigating cardiovascular risk in older adults [15]. Furthermore, Our study revealed a significantly higher prevalence of traditional cardiovascular risk factors, including diabetes mellitus, hypertension, and dyslipidemia, in the CAD group. These results align with existing literature that documents a high prevalence of hypertension in elderly populations [16]. Moreover, the interaction between these risk factors compounds the overall cardiovascular burden and exacerbates the progression of CAD. For instance, diabetes mellitus not only increases the risk of developing CAD but also contributes to poorer outcomes in those already diagnosed [17,18]. Similarly, uncontrolled hypertension has been consistently linked to adverse cardiovascular events, including heart attacks and strokes, particularly in older adults.

The findings also underscore the importance of early screening and management of these risk factors in octogenarians. Implementing targeted interventions, such as lifestyle modifications and pharmacotherapy, could significantly reduce the incidence and severity of CAD in this demographic. Furthermore, comprehensive geriatric assessment should be integrated into routine clinical practice to identify and address the multifaceted needs of elderly patients, facilitating more effective management of comorbid conditions. As our population continues to age, there is an urgent need for healthcare systems to adapt and prioritize strategies that address the unique challenges posed by cardiovascular risk factors in older adults.

Comorbid conditions, such as chronic kidney disease and Alzheimer's disease, were also more prevalent in the CAD group. This finding corroborates the Atherosclerosis Risk in Communities (ARIC) Study, which identified chronic kidney disease as a substantial risk factor for cardiovascular morbidity and mortality [19].

The presence of these comorbidities complicates the clinical management of CAD, as patients often face multiple health challenges that require coordinated care. For instance, chronic kidney disease can exacerbate cardiovascular risk through mechanisms such as fluid overload, electrolyte imbalances, and systemic inflammation [20]. Similarly, Alzheimer's disease may affect patients' ability to adhere to treatment regimens, further increasing their cardiovascular risk [21]. Coronary angiography demonstrated a significant prevalence of Coronary Artery Disease (CAD) within the study cohort, with three-vessel disease being the predominant manifestation. This distribution of CAD severity aligns with previous research, which similarly reported a substantial burden of multi-vessel disease in elderly patients undergoing coronary angiography [22,23].

The predominance of three-vessel disease in this population raises important clinical considerations for management strategies. Multi-vessel disease is often associated with worse prognoses and a higher risk of adverse cardiovascular events, necessitating more aggressive therapeutic interventions. These may include revascularization procedures such as Coronary Artery Bypass Grafting (CABG) or Percutaneous Coronary Interventions (PCI), tailored to the individual patient's clinical profile and comorbid conditions [24,25]. Additionally, the high prevalence of multi-vessel disease highlights the need for comprehensive cardiovascular risk management, including lifestyle modifications and pharmacotherapy aimed at controlling hypertension, dyslipidemia, and diabetes. Given the complex interplay of these factors, a multidisciplinary approach involving cardiologists, geriatricians, and primary care providers is crucial to optimize care for elderly patients with CAD [26,27]. While not reaching statistical significance, our analysis identified elevated in-hospital and mid-term mortality rates within the CAD group. These observations are consistent with existing literature, which also documents increased mortality rates among elderly patients with CAD [28,29].

The higher mortality rates in this population can be attributed to several factors, including the presence of multiple comorbidities, the severity of coronary artery disease, and age-related physiological changes that may complicate treatment [30,31]. Elderly patients often have a reduced physiological reserve, making them more susceptible to complications during hospitalization and recovery [32,33]. Moreover, the increased mortality risk highlights the importance of timely intervention and comprehensive management strategies for octogenarians with CAD [34,35]. This includes not only acute management during hospitalization, but also post-discharge follow-up and rehabilitation programs designed to improve cardiovascular health and quality of life. The divergent causes of death between the CAD and no CAD groups, notably the higher incidence of cardiac death in the CAD group, underscore the necessity for proactive and comprehensive cardiovascular risk management strategies within this demographic [36,37].

Limitations

Our study presents several limitations that warrant consideration. Firstly, the retrospective cohort design is inherently susceptible to biases, such as recall and selection bias, which may have influenced the results. Secondly, the single-center nature of the study limits the generalizability of the findings to other populations or settings. Thirdly, the reliance on self-reported data may have introduced inaccuracies due to potential misreporting or recall errors. Additionally, unmeasured confounders may have influenced the observed associations, despite our attempts to control for known confounding factors. Furthermore, the disparity in sample sizes between the CAD and No CAD groups may have affected the statistical power and precision of our comparisons. Finally, the relatively short follow-up period may not have captured the full spectrum of long-term outcomes associated with the exposure or interventions under investigation.

Conclusion

This investigation offers valuable insights into the clinical characteristics and outcomes of octogenarians with and without coronary artery disease (CAD). Notably, the study reveals a significantly higher burden of cardiovascular risk factors and comorbidities among elderly individuals with CAD compared to those without. The high prevalence of conditions such as diabetes mellitus, hypertension, dyslipidemia, chronic kidney disease, and Alzheimer's disease in the CAD group emphasizes the complex and multifactorial nature of CAD in this age cohort. These comorbidities have the potential to substantially influence the diagnosis, management, and prognosis of CAD, underscoring the necessity for a comprehensive, patient-centered approach to care in this population.

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Conflict of Interest

The authors declare no conflicts of interest and have no financial disclosures related to this study.

Ethical Considerations

Ethical approval was obtained from the Ethics Committee of Shahid Sadoughi University of Medical Sciences (approval code IR.SSU.MEDICINE.REC.1400.366). Ethical principles and regulations were strictly adhered to throughout the study.

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