Association of Clinical Factors for Short- Term Clinical Outcome of Primary Percutaneous Coronary Intervention (P-PCI) in Patients Presented with ST-Segment Elevation MI (STEMI)

Short Title: Factors for Percutaneous Coronary Intervention

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Declarations

Ethical approval and consent to participate: Ethical approval is not applicable for this paper because neither any human trial and animal was involved.

Consent for Publication: Not applicable

Availability of data and material: All data generated or analyzed during this study are included in this published article and its supplementary information files.

Competing interests: The authors declare that they have no competing interests

Funding: No funding was obtained for this study

Authors Contribution: All the authors have contributed equally to the conception and design, or acquisition of data, or analysis and interpretation of data; drafting and revision and given final approval of the version to be published.

Acknowledgements: Not Applicable

ABSTRACT

Primary Percutaneous Coronary Intervention (P-PCI) is an essential procedure for increasing the survival of ST-Segment Elevation Myocardial Infarction (STEMI) patients. However, there are discrepancies regarding the superiority of PCI and CABG. Several factors influence patient outcomes and survival. Short term and long term patient outcomes after successful PCI implementation are documented in the literature. This study aimed to evaluate the effect of demographic, clinical factors on the short-term clinical outcomes in patients with STEMI undergoing primary PCI. A total of 60 patients with STEMI were included in this study. Patients were evaluated for their respective medical history, followed by physical examination, blood tests, Standard 12 lead ECG. Later on, coronary angiography and primary PCI were performed. Conventional transthoracic echocardiography was done during the first presentation and 30 days of clinical follow up was done at the XXX. The present analysis suggested that age is having statistically important and significant association with multiple factors related with the risk of the disease conditions such as degree of vessels outcomes ($P = 0.0111$), the effectiveness of (GPIIb/IIIa) inhibitors used ($P = 0.0107$), the influence of hypertension ($P = 0.0377$), IRA conditions ($P = 0.0325$), pre-treatment stage LVEF values ($P = 0.0005$), ST-segment resolution results ($P < 0.0001$), and the symptom to FMC ($P = 0.0001$). Smoking was also associated with age for the current patients ($P = 0.0106$). The present study was able to establish statistically significant associations related to age, gender, LVEF, TIMI flow, and the use of GPIIb/IIIa inhibitors with P-PCI outcomes.

Key words: Primary Percutaneous Coronary Intervention (P-PCI), ST-elevation myocardial infarction (STEMI)

Introduction

Effective diagnosis and treatment decision is crucial for appropriate patient outcomes and reduced mortality risk for myocardial infarction (MI). Several demographic, clinical, diagnostic, prognostic factors are associated with better or poor patient outcomes related to MI.Careful investigation, rapid and accurate decision, choosing proper interventional technique when necessary, preoperative and post-surgery patient monitoring and surveillance. Effective follow-up with individual case-specific attention may improve the situation and lead towards better survival of the patients. Mentioned factors remain crucial in this juncture, hence, keen attention to each associated and relevant influencing pathological and clinical reasons should be investigated for the best possible patient outcome.

ISSN: 0975-3583, 0976-2833 VOL 12, ISSUE 03, 2021

Multiple comorbidity issues including growing age, associated risk enhancers such as diabetes, smoking habits, hypertension influences the mortality risk for cardiovascular, specifically MI cases. Age increases the cardiovascular risk that is already a fact.[1] However, the conditions may with gender differences.[2,3] Associatedcondition like diabetes complicates underlying cardiovascular disease causes.[4,5] Smoking and hypertension are the other major cause of increased mortality due to coronary heart disease (CHD), stroke, cardiac failure, and peripheral arterial disease (PAD) [6,7].

Clues as long-term or short-term symptoms allow for rapidly diagnosing cardiac issues and decide suitable treatment options. Evaluation of preexisting and persistent chest pain and angina Pectoris are the primary indicators of the onset or progress of the disease condition.[8]

Often rapid non-invasive procedural intervention remains the option for the patient's survival. Percutaneous Coronary Intervention (PCI) is a commonly used technique in certain circumstances that can reduce the risk of mortality in odd situations.[9] Many studies have been conducted thus far to understand the procedural impact of primary PCI in long patient term survival for ST-segment elevation myocardial infarction (STEMI).[10] However, several studies recommended coronary-artery bypass grafting (CABG) as the superior procedure for long-term patient outcomes compared to the PCI.[11,12]

Relevant important clinical factors and conditions such as Left ventricular ejection fraction (LVEF), preoperative Thrombolysis in Myocardial Infarction (TIMI) flow score, Killip class,[13-16] and considered prescribed medication such as antiplatelet aggregation therapeuticsinfluences the outcomes and prognosis.[17]

The present study was aimed at understanding the complex relation of demographic, associated risk factors, TIMI scoring, Killip classification, LVEF, and other essential factors with relevance to PCI. Evaluations of the outcomes are done for prior intervention and post-intervention outcomes. Successful comparison of the pre and post conditions yielded the statistically significant changes due to the PCI. However, further clinical evidence is necessary to establish the observed relationships of vital factors.

Materials and Methods

Patients, Study site, and Ethical consideration

The study was a multisite, retrospective one that enrolled 60 patients with STEMI presented to the XXX who underwent primary PCI.

Inclusion criteria

Patients presented with STEMI within 12 hours of symptom onset undergone primary PCI. STEMI diagnosis confirmed if chest pain last >20 minutes with new or presumed new ST-elevation at the J point in two or more contiguous leads with the cut-off points $\geq$0.2 mV in leads V2 or V3 in males more than 40 years old, $\geq$0.25 mv in males less than 40 years old and $\geq$ 0.15 mv in females and $\geq$0.1 mV in other leads in at least two contiguous leads, and with an elevation of cardiac biomarkers at least one value above the 99th percentile of the upper limit of normal (ULN). Patients classified into two groups according to the presence of preinfarction angina (PA), defined as the presence of typical ischemic chest pain at rest or exercise which persisted <20 minutes within 24 hours before the onset of STEMI: (a) Group 1 with preinfarction angina (PA group), (b) Group 2 without preinfarction angina (non-PA group).

Exclusion criteria

Unconscious patients,who had more than 12 hours for symptom onset, patients who treated with primary PCI in the index procedure because of TIMI flow grade 3 in the infarct-related artery (IRA) at baseline angiography, were excluded from the present study.

Patient's medical history and physical examination

All patients were subjected to detailed medical history investigations including disease onset, course, time and duration of chest pain, and presence of risk factors and comorbidities. All the patients were submitted to complete clinical evaluation on admission where pulse rate, blood pressure, and the presence or absence of cardiac murmur, gallop or pulmonary congestion were extensively evaluated.

Specific clinical investigations

Complete blood count, blood glucose level, serum electrolyte (sodium, potassium, and magnesium), serum urea, creatinine, and cardiac biomarkers including CKMB and qualitative troponin were estimated and evaluated.

Standard 12 lead ECG

ECG was recorded on admission for each patient within less than 10 minutes of FMC in the emergency department and at 90 minutes after primary PCI, and ST resolution (STR) at 90 minutes assessed and classified as complete ($\geq$70%), partial (30%–69%) and absent (<30%).

Primary PCI

Coronary angiography and PCI was performed using the standard Judkins technique. The choice of stent type was done at the physician's discretion during PCI. Coronary flow assessed according to the Thrombolysis in Myocardial Infarction (TIMI) grading system, and procedural success was defined as residual stenosis ≤20% after PCI, with TIMI flow grade ≥2 and absence of death, emergency bypass surgery, and disabling cerebral events.

Transthoracic echocardiography

A full transthoracic echocardiography study was performed for all patients after PCI. The following measurements were obtained: Left ventricular(LV) dimensions, left ventricular ejection fraction (LVEF), mitral regurgitation grade, and the segmental wall motion score index.

Data collection and statistical analysis

All data were collected and assembled in an excel spreadsheet for further analysis. A detailed descriptive and inferential statistical calculation was done using SPSS (version 25.0), and R (3.6.1). All quantitative numerical data are presented as either percentage or mean±SDdepending on the data type. Chi-Square (χ^2) test was used for association analysis and P values <0.05 were considered as significant.

Results

The obtained data were subjected to detailed descriptive and inferential analysis to understand the patients' distribution concerning different factors considered in the present study, and their important plausible significant association.

Demographic data analysis

Age and gender

Collected initial data records on age, gender, associated risk factors such as the presence of diabetes, hypertension, and smoking habits of the patients, were analyzed.All the information was collected on 60 patients altogether. The observed data distribution suggested that most (n=53, 88.33%) of the patients who were included in this study were male (Figure1A), and only 11.66% of participants (n=7) were female.The observed mean age of the patients was 56.60 (±9.33) years. Few patients were between 40-45 years (Figure 1B), and none were between 70 and 75 years (Figure 1B).

Associated CVD risk factors

Important risk factors such as the presence of diabetes, hypertension, and smoking habits are already proven to be associated with a higher risk of heart attack, acute myocardial infarction, and a higher risk of mortality due to CVD complications. In the present scenario, the percentage of patients having diabetes (51.66%, n=31) was comparatively slightly higher than the non-diabetic participants (48.33%, n=29) (Figure 2A). However, clinical investigations regarding the presence of hypertension among the selected participants displayed most of the patients were not hypertensive (55%, n=33) (Figure 2B). On the contrary, the majority of the subjects had smoking habits (60%, n=36) (Figure 2C).

Clinical risk assessment outcomes

Angina and myocardial infarction

Routine clinical investigations were conducted for each subject to evaluate their respective clinical conditions and understand the associated risk of further complications and mortality. The analysis revealed that the reporting from the patients regarding the presence and absence of preinfarctionangina(PA and NPA) were equal in number (Figure 3A, n=30 for PA and NPA). Further, investigation on the incidence of prior myocardial infarction (MI) suggested no prior occurrence of myocardial infarction (85%, n=51) in most of the patients (Figure 3B). Assessment of MI at the anterior wall area (Anterior MI) suggested a contrary result where the presence of MI was noticed in the majority of the patients (55%, n=33) (Figure 3C).

Thrombolysis in Myocardial Infarction (TIMI) flow, Infarct-Related Artery(IRA), and degree of vessels

Assessment of the coronary flow is essential to understand the cardiac risks. TIMI risk scoring is a regularly used method to assess and predict the CVD risk of cardiac attack and complications towards higher risk of mortality of the patient. Higher the score, the greater the risk of recurrent or new MI, cardiac arrest, and severe ischemic conditions.In the present study, analysis of the TIMI flow was done at the time of the initial coronary angiogram, and the post-Percutaneous Coronary Intervention (PCI) procedure (Figure 4A and Figure 4B). Improvement of TIMI flow was observed from grade O and I during the initial coronary angiogram to grade II and III after the stent implantation through PCI. During the coronary angiogram, most of the patients (75%, n=45) were at grade O, and only 25% (n=15) the patients displayed grade I (Figure 4A). Post stent implantation through PCI, it was observed that the majority of the patients (71.66%, n=43) were at grade III (Figure 4B) while few showed (28.33%, n=17) output of at the level of grade II TIMI flow.

The identification of the infarct-related artery (IRA) was done for each patient. The outcomes suggested that most of the patients (58.33%, n=35) were having problems at the left anterior descending coronary artery (LAD) region, followed by the right coronary artery (RCA) (33.33%, n=20), and left circumflex artery (LCx) (8.33%, n=5) (Figure 4C). The observed degree of vessels is presented in Figure 4D where 1VS type was dominant followed by 3VS and 2VS.

Risk assessment by clinical symptoms, drug use, and ST-elevation analysis

In this study, the incidence of prior acute myocardial infarction and future possibilities of heart attack among the considered patients were estimated using the Killip classification system (Figure 5A), and ST resolution (Figure 5C) analysis. Further, an assessment was done on the prescribed medications, patients were consuming based on their respective health conditions. Out of different drugs, only glycoprotein inhibitors were accounted for (Figure 5B).

Prevalence was observed for the Killip class I (78.33%, n=47) compared to class II (21.66%, n=13) among the patients considered for the present study suggestingthe dominance of the absence of clinical signs for heart failure (Figure 5A).Usage of prescribed GpIIb or GpIIa inhibitors were found less among the patients (30%, n=18) (Fig.5B). ST resolution results are clinically used for the better prognostic purpose for myocardial infarction patients. The obtained outcomes displayed more number of subjects within 30-70 (55%, n=33), followed by >70 (28.33% , n=17), and <30 (16.66%, n=10) (Figure 5C).

Investigation of symptoms at first contact, LVEF, and MACE

Most of the demographic, and clinical evaluation did not show considerable preexisting signs of the myocardial infarction among the patients. Hence, additional information was collected on the appearance of symptoms to first medical contact (Figure 6A), the efficiency of the left ventricle through Left ventricular ejection fraction (LVEF) before the procedure, and during follow up (Figure 6B and Figure 6C). During the follow-up period, major advanced cardiovascular events were also estimated (Figure 6D). Symptoms related to the first medical contact suggested 3H and 6H as crucial time followed by 11H and 8H. The normal range of LVEF is 55%to 70%,the mean LVEF before the procedure was 46.63% (±7.84) which was below the normal range (Figure 6B). Later evaluation during the follow up after PCI the obtained mean for LVEF was improved slightly (47.13±8.60). Only 12 patients (20.0%) were having LVEF outcomes within the specified normal range before the stent implantation through PCI. The postoperative evaluation suggested that two patients died due to severity in conditions. Hence, out of 58 patients, 16 were having LVEF outcomes within the normal range (27.58%) (Figure 6C). The analysis of the severe complications for the patients after the procedure (MACE) showed that a total of 2 patients expired, 1 patient displayed repeated myocardial infarction, and 1 patient required target vessel revascularization (TVR) (Figure 6D).

Association analysis of the factors

The considered parameters were vital for the MI incidence, therefore, the statistical association of these factors was investigated through Chi-Square (χ^2) test with a significant P value below 0.05.[18,19] A detailed analysis was done for the relevant parameters with clinical significance. The obtained statistically significant associations are presented in Table 1. Supplementary figures (Supplementary Figure 1 to Supplementary Figure 23) provide a detailed presentation of the association of various factors considered for the present study.

Comparative analysis of the presence of pre-infarction angina

All the patient data for each parameter were further categorized based on the presence and absence of preinfarction angina. The distribution of samples in these two categories was almost equal in both groups. A comparative analysis was performed between the two groups and the test of significance was inspected using the Pearson Chi-Square (X^2) test with Yates' continuity correction (Table 2).

Besides, the pairwise T-test was considered using the Student T-tests and Wilcoxon Signed rank test for the numerical parameters (Figure 7).

The mean age of the patients (P 0.363, P 0.341), and left ventricular ejection fraction measured in the hospital (P 0.976, P 0.649) did not show any statistical significance (Figure 7) concerning presence or absence of preinfarction angina. However, the factor of preinfarction angina was crucial and statistically significant for left ventricular ejection fraction after follow up (P 0.033,P 0.029).

Discussion

Cardiovascular disease has become one of the major life-threatening conditions for mankind in recent times. Epidemiological data suggest growing death tolls and the number of patients every year.[20] Out of the different cardiovascular complications, growing cases of heart attack, heart failure, are alarming.[21]

The severity of myocardial infarction requires special attention for prompt responses and decisions from the medical practitioner. Rapid evaluation of the patient conditions and treatment decisions are other major factors that may increase the survival outcomes of the patients. Even though coronary artery bypass surgery (CABG) is considered as one of the best options for better patient outcomes,[22,23] depending on the conditions, PCI is considered occasionally. PCI being a comparatively being minimally invasive procedure in nature is having an advantage in many circumstances. Report by Weintrauband colleagues (2008) recommended the better outcome of PCI on the quality of life of the patients having stable angina in comparison to optimal medical therapy.[24]

The selection of the procedure depends on various factors that range from demographic parameters such as age, associated risk factors such as hypertension, diabetes, smoking, and cholesterol levels, clinical evaluation of the CVD, and genetic condition.[25-29]

A recent study was conducted to understand the association of age and gender for renin-angiotensin system blockade (RASb) in heart failure where the RASb treatment was suggested to be comparatively beneficial for male and young patients.[30] In a similar context, reduced diastolic performance was reported with increased age and significant torsion for women.[31]

Our present analysis suggested that age is having significant association with various factors that influence the risk of the disease conditions such as degree of vessels outcomes ($P = 0.0111$), the effectiveness of the inhibitors (GPIIb/IIIa) used ($P = 0.0107$), the influence of hypertension ($P = 0.0377$), IRA conditions ($P = 0.0325$), pre-treatment stage LVEF outputs ($P = 0.0005$), ST resolution results ($P < 0.0001$), and the symptom to FMC ($P = 0.0001$). Smoking was also associated with age for the current patients ($P = 0.0106$). Therefore, the present study detected many intricate factors associated with age and myocardial infarction. Similarly, gender was also observed to be a statistically significant factor for MACE observed during follow up after the stent implantation ($P = 0.0001$) and was biased for predominant diabetic conditions ($P = 0.0069$) for the participants of this study. The implementation of PCI was significantly successful in altering the LVEF output ($P < 0.0001$) for the subjects. Other studies also reported similar improvements in LVEF after angioplasty for left main coronary artery stenosis.[32]

Application of GPIIb/IIIa inhibitors as a blocker of platelet aggregation, aids in acute myocardial infarction effectively.[33] Moreover, in high-risk patients, these inhibitors have shown a considerable reduction in mortality.[34] However, during PCI for the acute phase of myocardial infarction (AMI), the application of glycoprotein (GP) IIb/IIIa yielded benefits.[35] The present study also revealed that GPIIb/IIIa inhibitors are influential for anterior wall myocardial infarction ($P = 0.0213$), IRA ($P = 0.0065$), LVEF improvement ($P = 0.0020$), and in improving the TIMI flow significantly ($P = 0.0003$).

Evaluation through TIMI flow risk grade for serious patients with myocardial infarction is necessary for a better understanding of the risk factors and effective prognosis.[36] The relationship of TIMI flow grade and ruptured plaques was established earlier.[37] For ST-segment elevation myocardial infarction (STEMI) patients and subjects with cardiogenic shock, less improved TIMI flow grade after PCI was found to be associated with a higher mortality rate.[38] We also observed the association of TIMI flow after the PCI procedure with the post-operative LVEF outcomes ($P = 0.0141$). Therefore, the present study was able to investigate the associations of vital factors related to myocardial infarction patient outcomes.

Preinfarction angina is known to have an established role in cardioprotection through various significant ways including reduced infarct size, protective left ventricular contractility, and conserving the microvasculature.[39] Hence, the role of preinfarction angina was explored. A comparative analysis of all the factors considered in this study was done with reference to the presence and absence of preinfarction angina. However, no statistically significant difference was observed in any case except for the left ventricular ejection fraction (LVEF) after the follow-up which was in agreement with the earlier reports.[39]

Conclusion

Myocardial infarction is a serious medical condition and involves several factors that influence the survival and mortality. Understanding each associated factor with time is important. Moreover, a case-by-case analysis is mandatory considering the critical patient outcomes. The present study was able to unfold such significant associations related to age, gender, LVEF, TIMI flow, and the use of GPIIb/IIIa inhibitors with PCI outcomes. A cohort study with varying demography, additional coronary factors may confirm the present findings.

ISSN: 0975-3583, 0976-2833 VOL 12, ISSUE 03, 2021

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ISSN: 0975-3583, 0976-2833 VOL 12, ISSUE 03, 2021

Figures

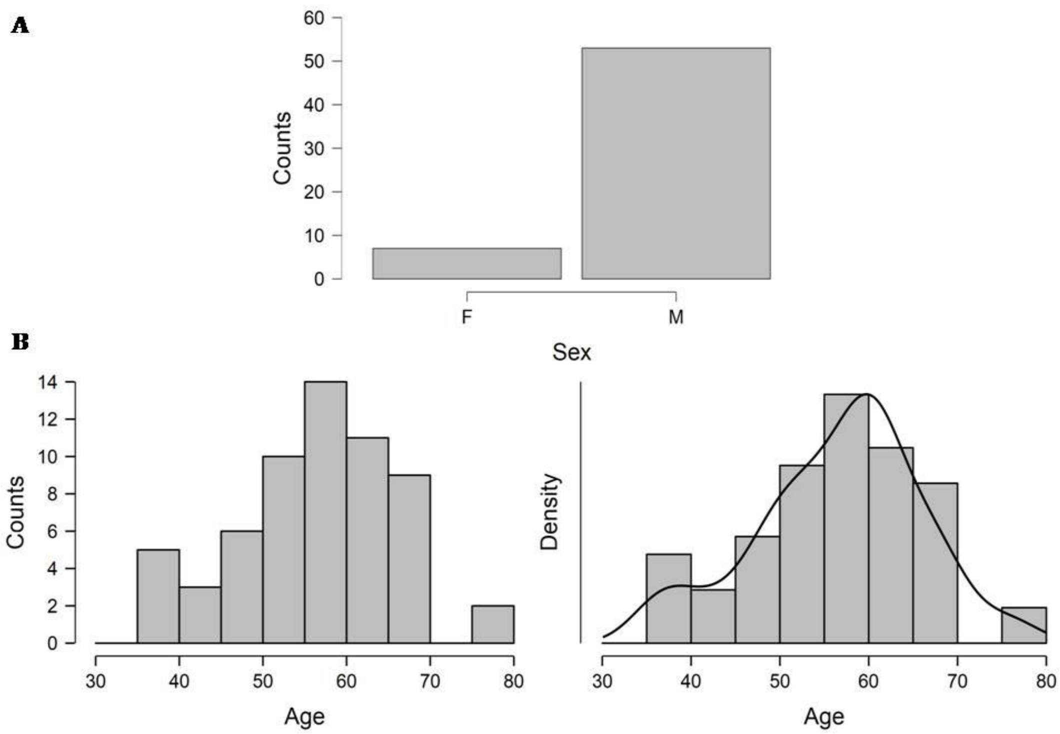

Figure 1: Distribution of demographic parameters for the patients considered for the study. (A) Gender of the patients.(B) The number of patients with their respective age groups and the density of the age group.

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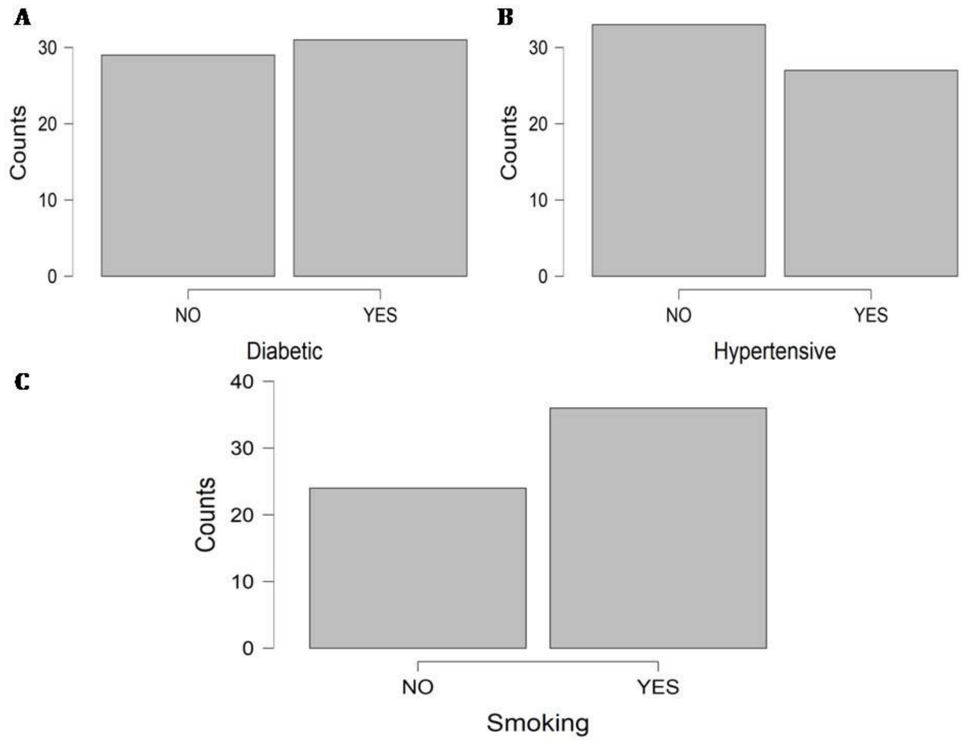

Figure 2: Distribution of associated risk factors in considered patients as recorded during the study. (A) Presence and absence of diabetes among the patients.(B) Presence and absence of hypertension among the patients. (C) Distribution of the patients based on their smoking habits.

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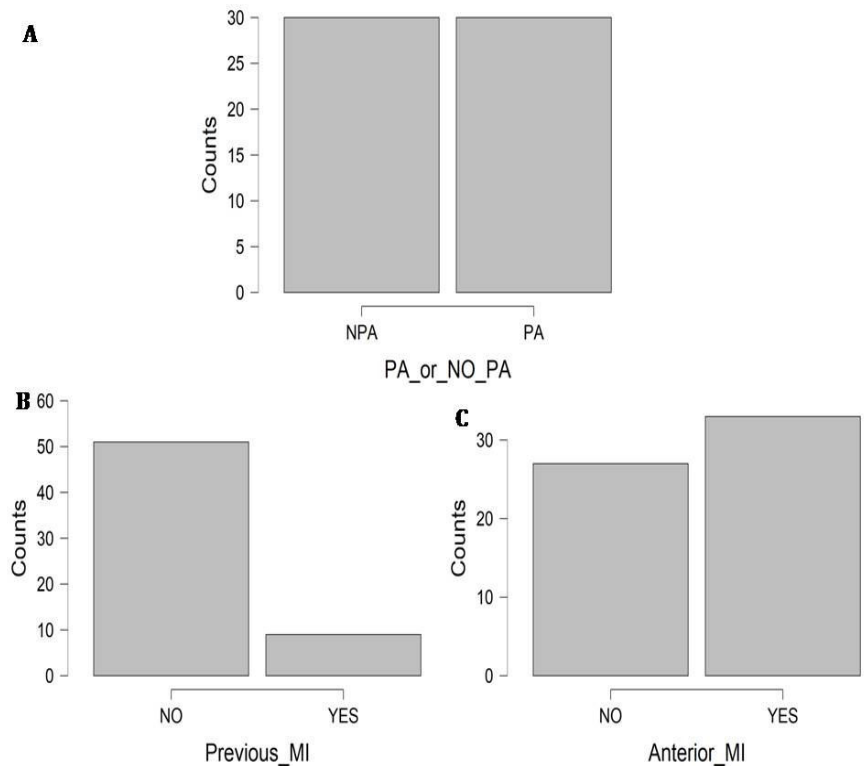

Figure 3: (A) Equal distribution of the existence of angina (NPA= No preinfarctionangina, PA=Presence of preinfarctionangina) as recorded during the symptom analysis of the patients. The patient assessment outcomes of the (B) previous occurrence of myocardial infarction, and (C) myocardial infarction in the anterior wall region.

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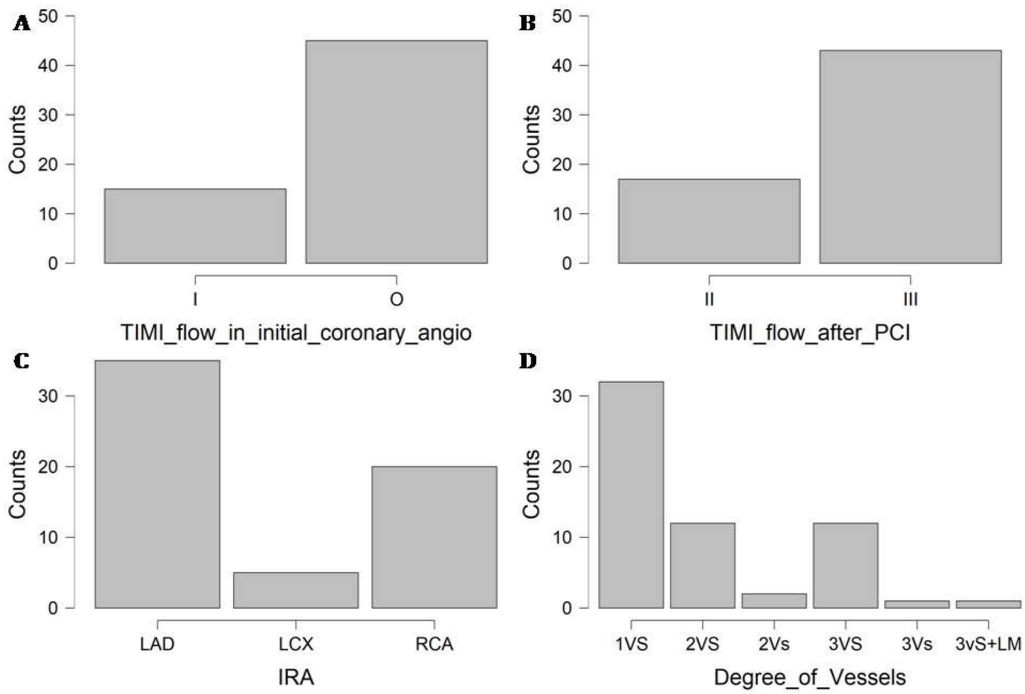

Figure 4: Presentation of important parameters related to surgical procedure. (A) Presentation of TIMI (Thrombolysis In Myocardial Infarction) flows grade in the patients during the initial coronary angiography. (B) Representation of the improved TIMI flow grades among the patients after the PCI procedure. (C) Distribution of infarct-related artery (IRA) as observed among the patients. (D) Degree of vessels as obtained during the surgery.

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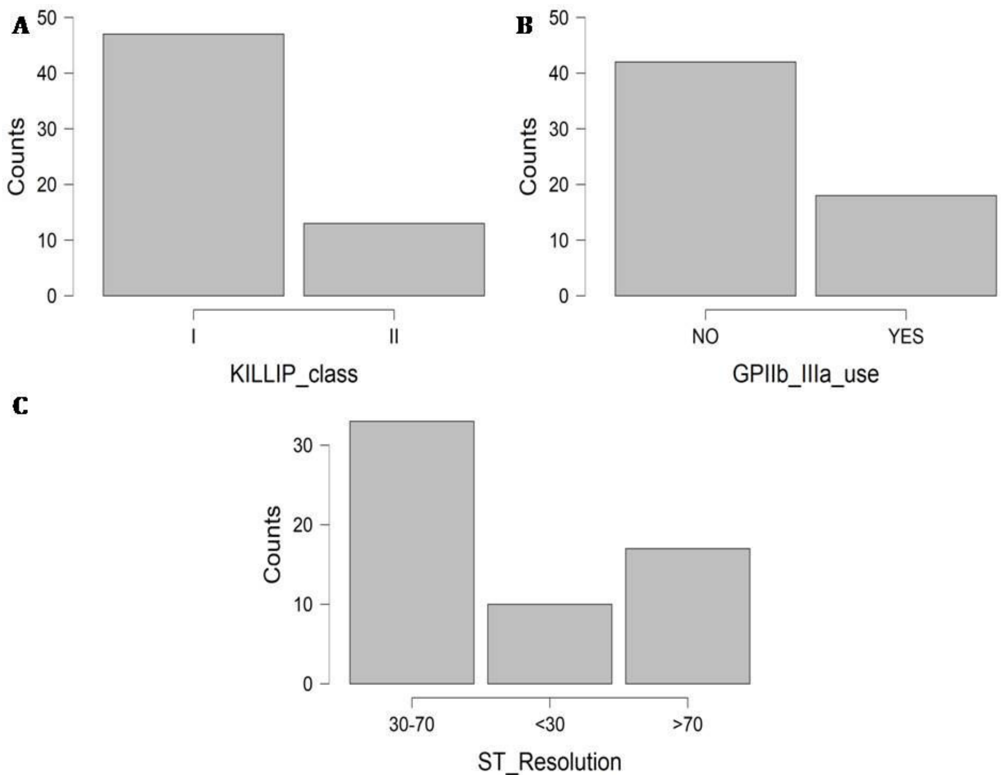

Figure 5: (A) Distribution of Killip class as noted during the investigation of the patient's symptoms. Class I represents no clinical sign, and class II represents specific evidence of heart issues such as crackles in the lungs, increased jugular vein pressure, and others. (B) Consideration of the glycoprotein IIb/IIIa inhibitors by the patients.(C) Presentation of improved prognostic outcomes as post-therapeutic ST resolution.

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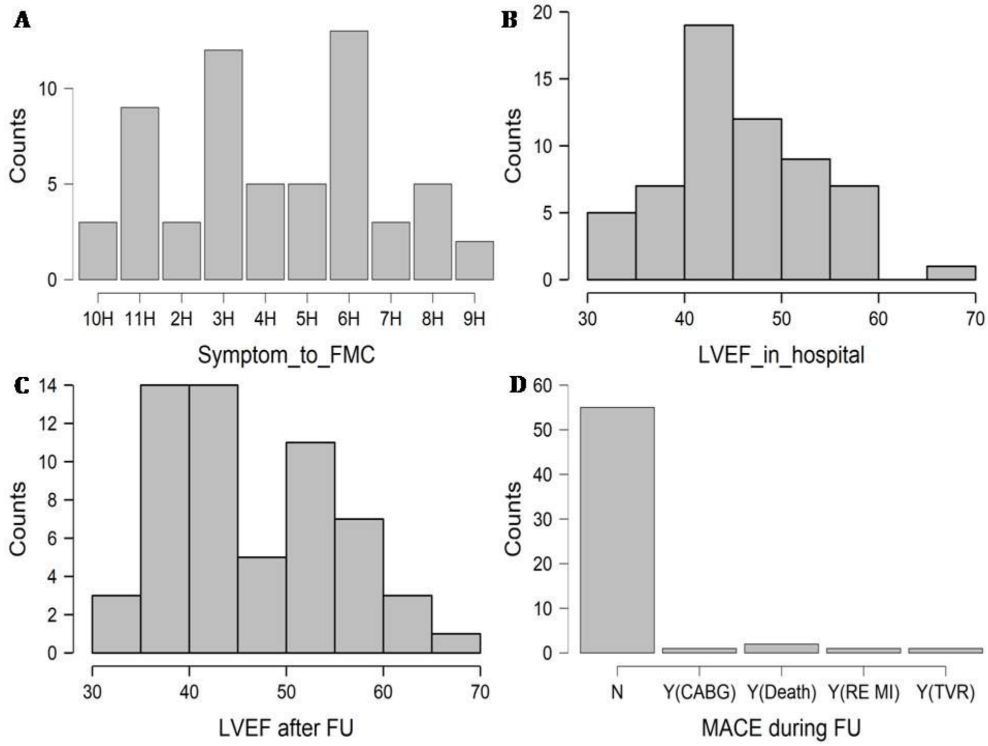

Figure 6: (A) The observed symptoms to first medical contact (FMC). A comparative presentation of the left ventricular ejection fraction (LVEF) of the patients at the preprocedural, and post-procedural stage. (B) LVEF as assessed before the procedure and (C) improved LVEF outcomes during follow up of the patients after the process. (D) Major adverse cardiovascular events (MACE) as observed during the follow up at the post-process stage.

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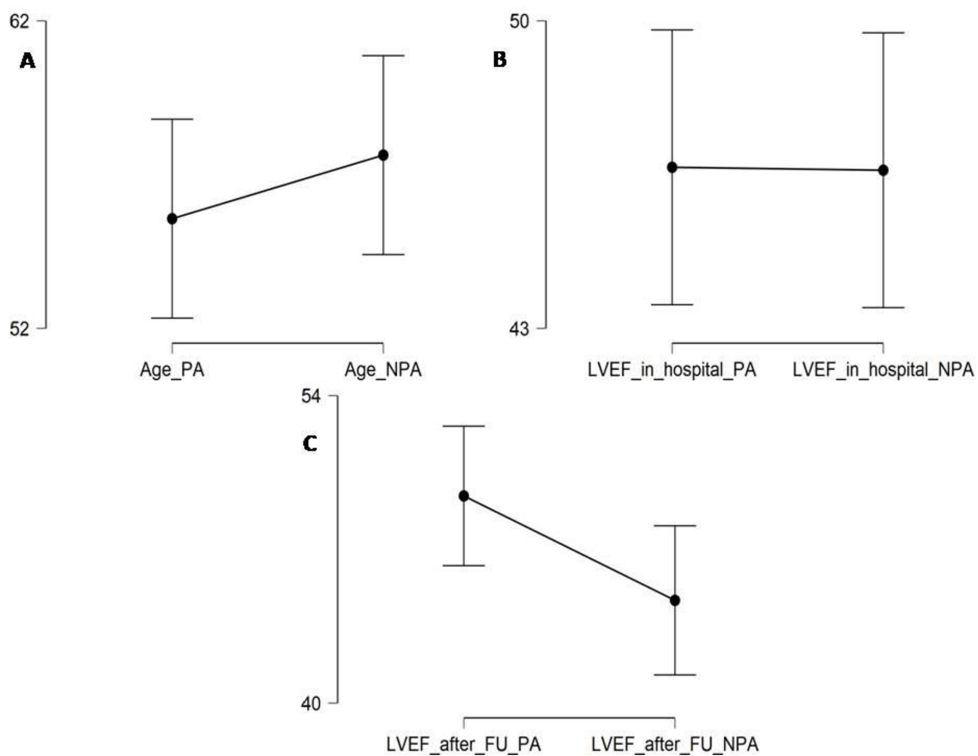

Figure 7: (A) Pairwise T-Test results for the age of the patients in with and without preinfarction angina. (B) A comparative presentation of the patients having preinfarction angina with relation to left ventricular ejection fraction (LVEF). (C) Comparative analysis outcome of LVEF after follow-up with respect to preinfarction angina.

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Table 1: The observed significant association among various factors obtained through Chi-Square (χ^2) test.

Factor1	**Factor2**	**Significant P-values**
LVEF_in_hospital	LVEF_after_FU	P < 0.0001
Age	Degree_of_Vessels	P = 0.0111
Age	GPIIb_IIIa_use	P = 0.0107
Age	Hypertensive	P = 0.0377
Age	IRA	P = 0.0325
Age	LVEF_in_hospital	P = 0.0005
Age	Smoking	P = 0.0106
Age	ST_Resolution	P < 0.0001
Age	Symptom_to_FMC	P = 0.0001
GPIIb_IIIa_use	Age	P = 0.0107
GPIIb_IIIa_use	Anterior_MI	P = 0.0213
GPIIb_IIIa_use	IRA	P = 0.0065
GPIIb_IIIa_use	LVEF_after_FU	P = 0.0020
GPIIb_IIIa_use	LVEF_in_hospital	P = 0.0006
GPIIb_IIIa_use	TIMI_flow_after_PCI	P = 0.0003
GPIIb_IIIa_use	TIMI_flow_in_initial_coronary_angio	P = 0.0037
IRA	Age	P = 0.0325
IRA	Anterior_MI	P < 0.0001
IRA	GPIIb_IIIa_use	P = 0.0065
IRA	KILLIP_class	P = 0.0189
IRA	LVEF_in_hospital	P = 0.0030
IRA	Symptom_to_FMC	P = 0.0347
KILLIP_class	Anterior_MI	P = 0.0025
KILLIP_class	IRA	P = 0.0189
KILLIP_class	LVEF_after_FU	P = 0.0060
KILLIP_class	LVEF_in_hospital	P = 0.0152
KILLIP_class	MACE_during_FU	P = 0.0035
KILLIP_class	Smoking	P = 0.0424
KILLIP_class	ST_Resolution	P = 0.0345
KILLIP_class	TIMI_flow_after_PCI	P = 0.0222
Sex	Degree_of_Vessels	P = 0.0021
Sex	Diabetic	P = 0.0069
Sex	MACE_during_FU	P = 0.0001
TIMI_flow_in_initial_coronary_angio	GPIIb_IIIa_use	P = 0.0037
TIMI_flow_after_PCI	GPIIb_IIIa_use	P = 0.0003
TIMI_flow_after_PCI	KILLIP_class	P = 0.0222
TIMI_flow_after_PCI	LVEF_after_FU	P = 0.0141
TIMI_flow_after_PCI	LVEF_in_hospital	P = 0.0052
TIMI_flow_after_PCI	ST_Resolution	P = 0.0128

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Table 2: Chi-Square Test results (Pearson's Chi-squared test with Yates' continuity correction).

Parameter1	Parameter2	Chi Square (X^2)	DF	P-value
Age PA	AGE NPA	325.83	315	0.3252
SEX PA	SEX NPA	6.3834e-30	1	1
Diabetic PA	Diabetic NPA	1.1205	1	0.2898
Hypertensive PA	Hypertensive NPA	0.077538	1	0.7807
Smoking PA	Smoking NPA	0.016741	1	0.8971
Previous MI PA	Previous MI NPA	2.9517e-30	1	1
Anterior MI PA	Anterior MI NPA	1.25	1	0.2636
KILLIP class PA	KILLIP class PA	0.1256	1	0.723
Symptom to FMC PA	Symptom to FMC NPA	71.312	72	0.5007
IRA PA	IRA NPA	7.5809	4	0.1082
Degree of Vessels PA	Degree of Vessels NPA	17.192	12	0.1425
GPIIbIIIa use PA	GPIIbIIIa use NPA	8.1409e-32	1	1
TIMI flow in initial coronary angio PA	TIMI flow in initial coronary angioNPA	0.03	1	0.8625
TIMI flow after PCI PA	TIMI flow after PCI NPA	1.1413	1	0.2854
ST Resolution PA	ST Resolution NPA	3.4166	4	0.4907
LVEF in hospital PA	LVEF in hospital NPA	265.83	272	0.594
MACE during FU PA	MACE during FU NPA	1.9483e-30	1	1
LVEF after FU PA	LVEF after FU NPA	287	285	0.4556

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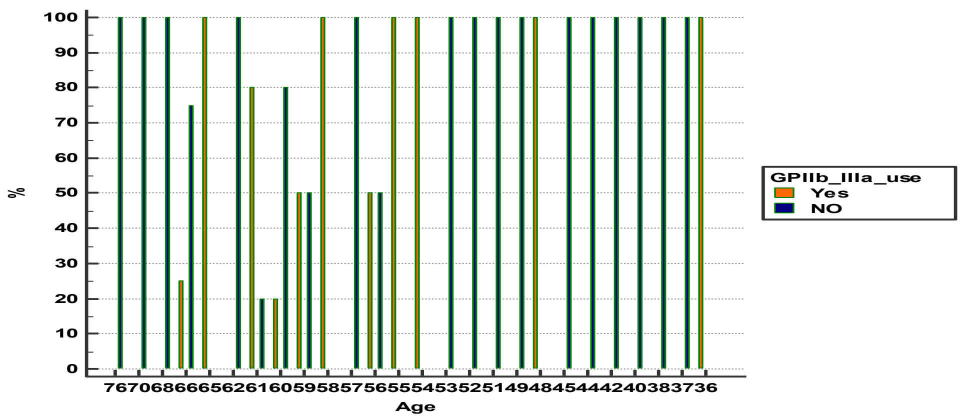
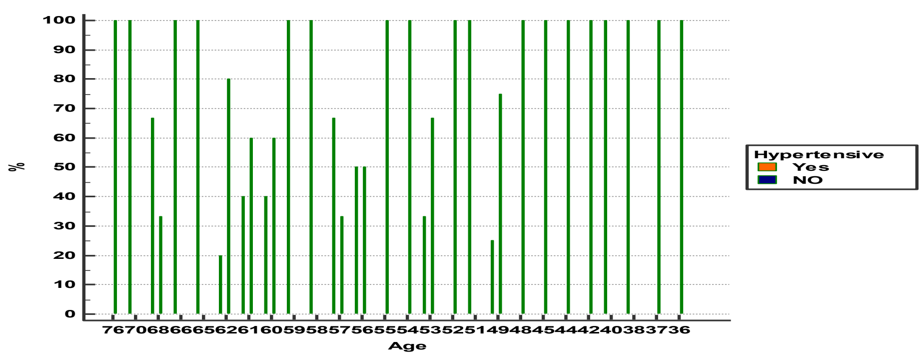
Supplementary Figures

All the factors that were part of this study were subjected to the assessment of statistical association using Chi-Square (χ^2) test. The obtained graphical representations of the significantly associated parameters are presented here as Supplementary Figure 1 to 23.



Supplementary Figure1: Presentation of the percentage of patients used Glycoprotein inhibitors IIb and IIa with reference to the age distribution of the patients.



Supplementary Figure2: Presentation of the percentage of patients having hypertension with reference to the age distribution.

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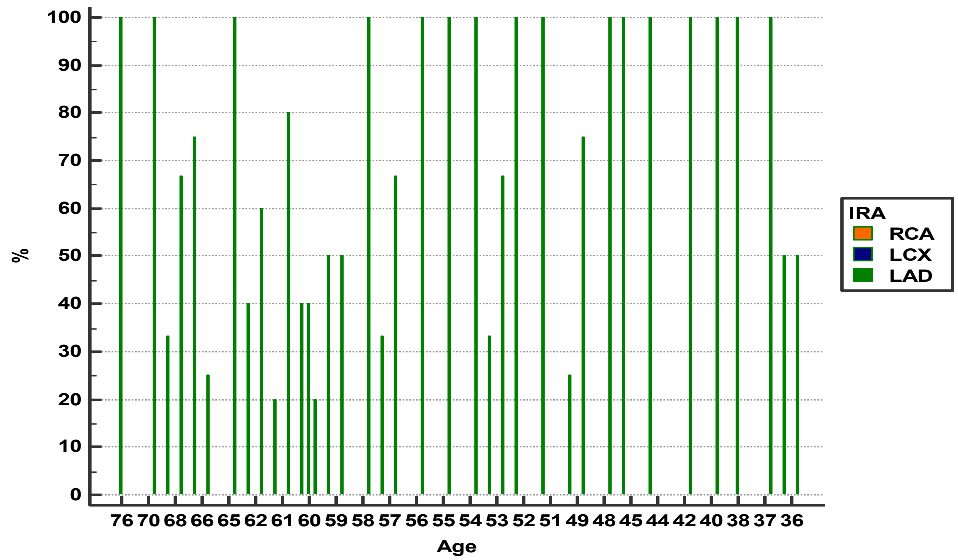
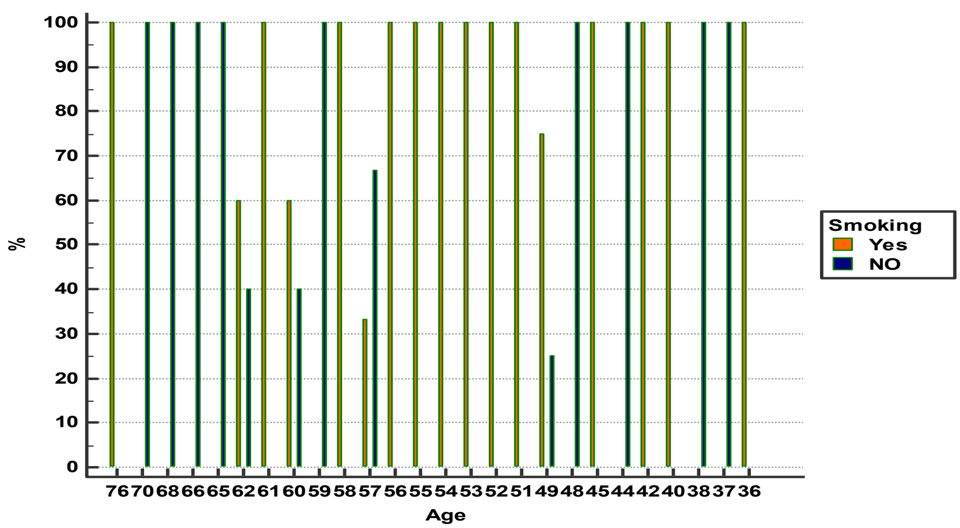


Supplementary Figure3: Patient percentage distribution with reference to the infarct-related artery (IRA) types and age.



Supplementary Figure4: Patient percentage distribution with reference to their smoking habits and age.

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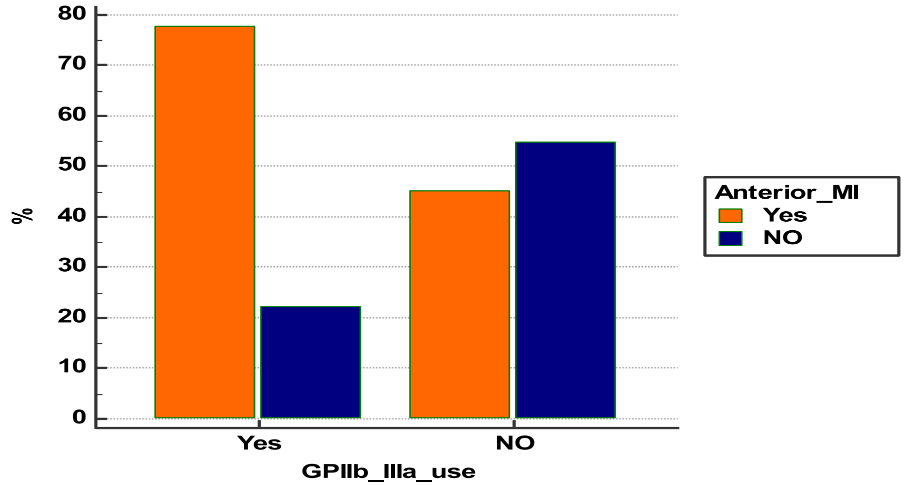
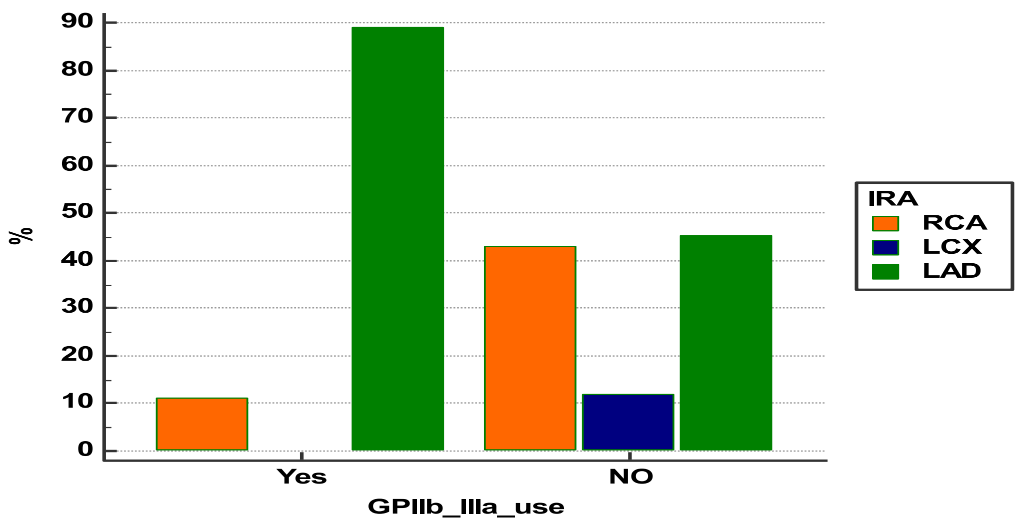


Supplementary Figure5: Patient percentage distribution with reference to the usage of GPIIb and GPIIa inhibitors and occurrence of anterior myocardial infarction.



Supplementary Figure6: Patient percentage distribution with reference to the usage of GPIIb and GPIIa inhibitors and the diagnosed infarct-related artery (IRA) types.

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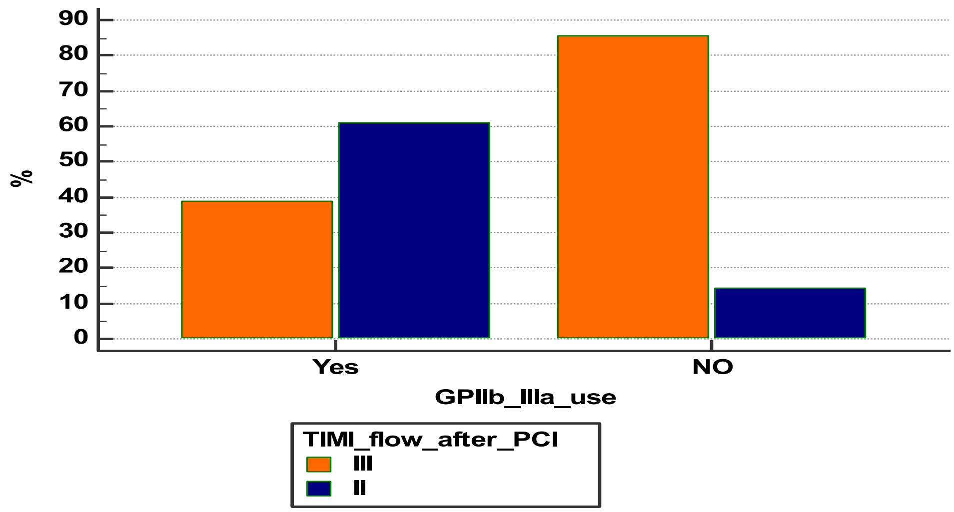
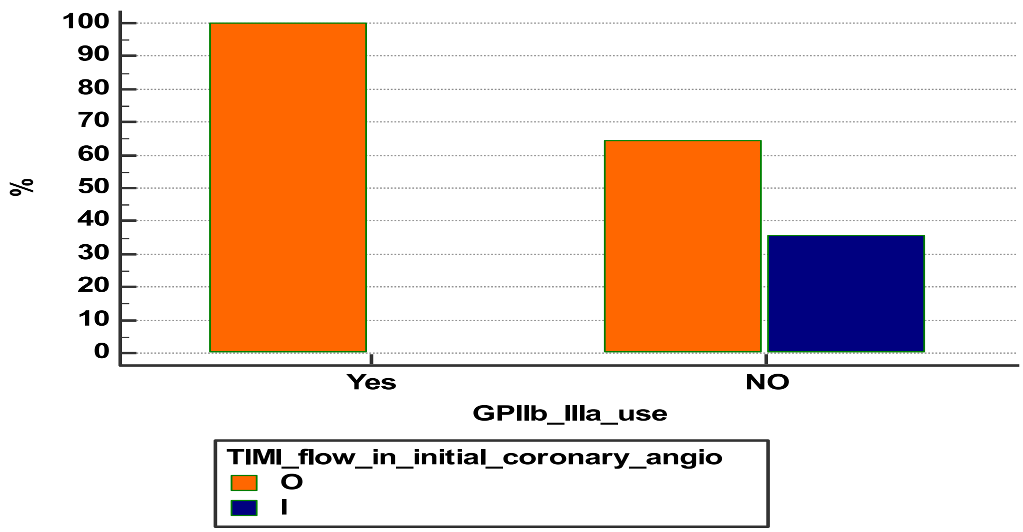


Supplementary Figure7: Percentage of patients having Thrombolysis in Myocardial Infarction (TIMI) flow with grade II and III with respect to the usage of GPIIb and IIa drugs.



Supplementary Figure8: Percentage of patients having Thrombolysis in Myocardial Infarction (TIMI) flow with grade O and I with respect to the usage of GPIIb and IIa drugs during initial stage of coronary angiography.

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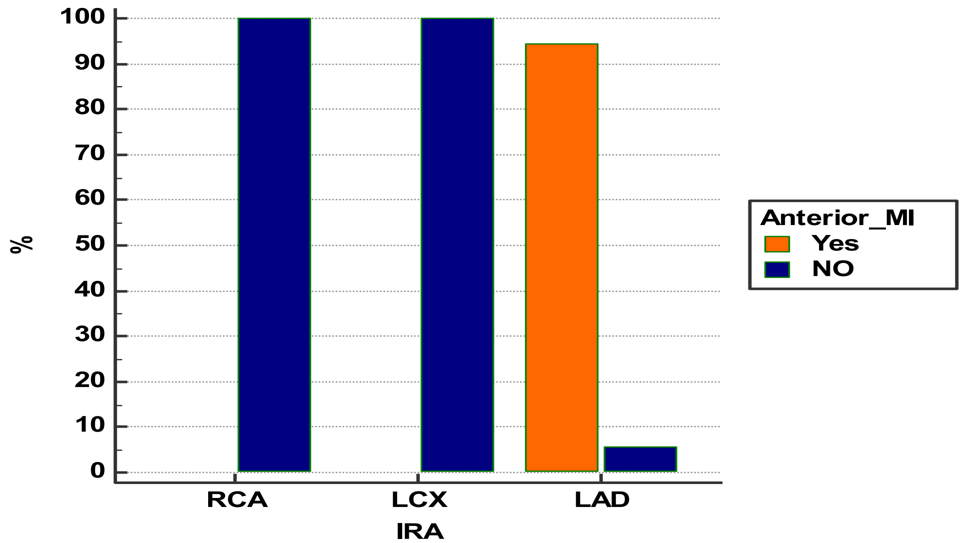
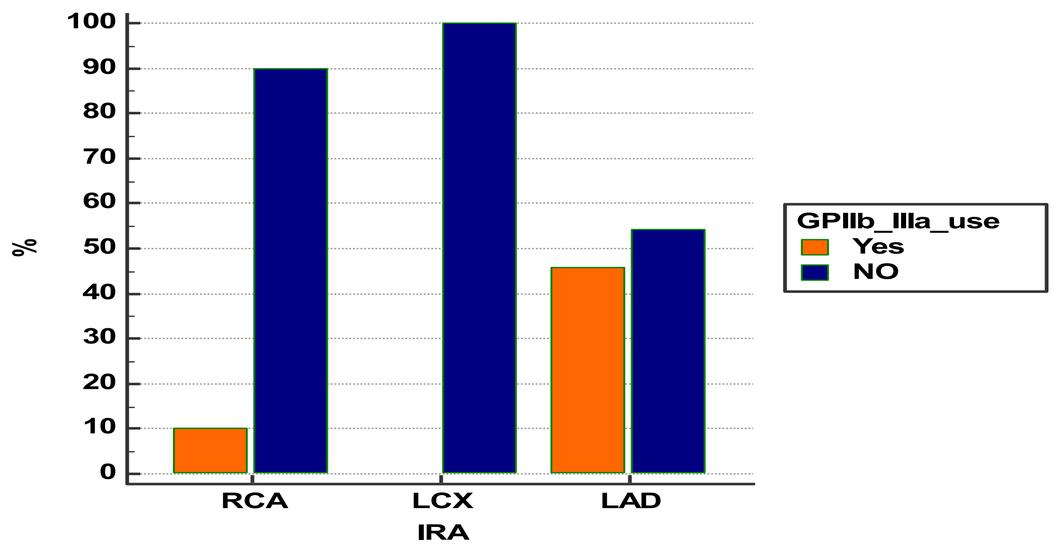


Supplementary Figure9: IRA types in percentage of patients with reference to anterior myocardial infarction.



Supplementary Figure10: IRA types in percentage of patients with reference to use of GpIIb and GPIIa inhibitors.

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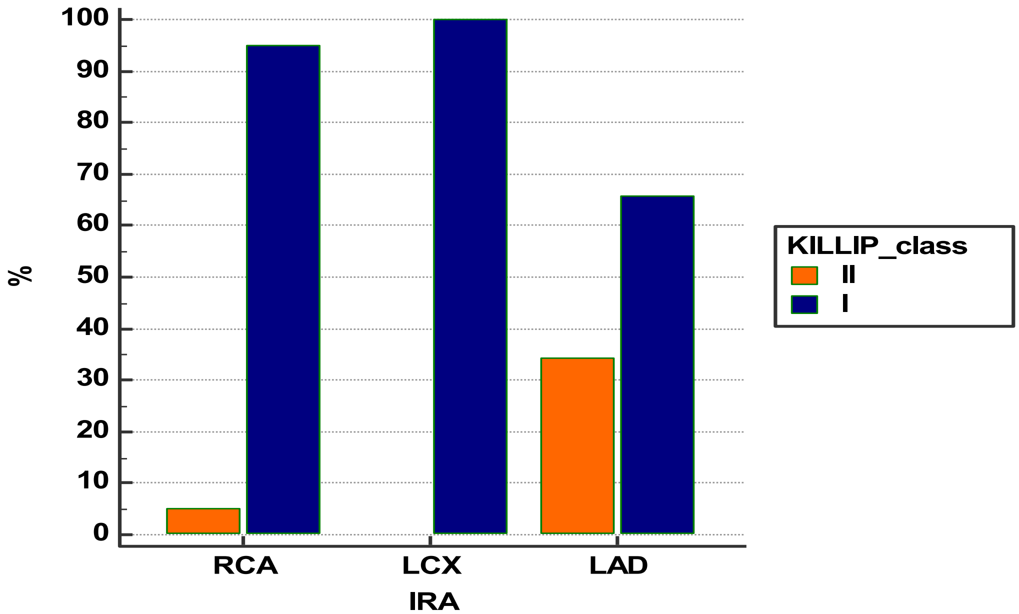
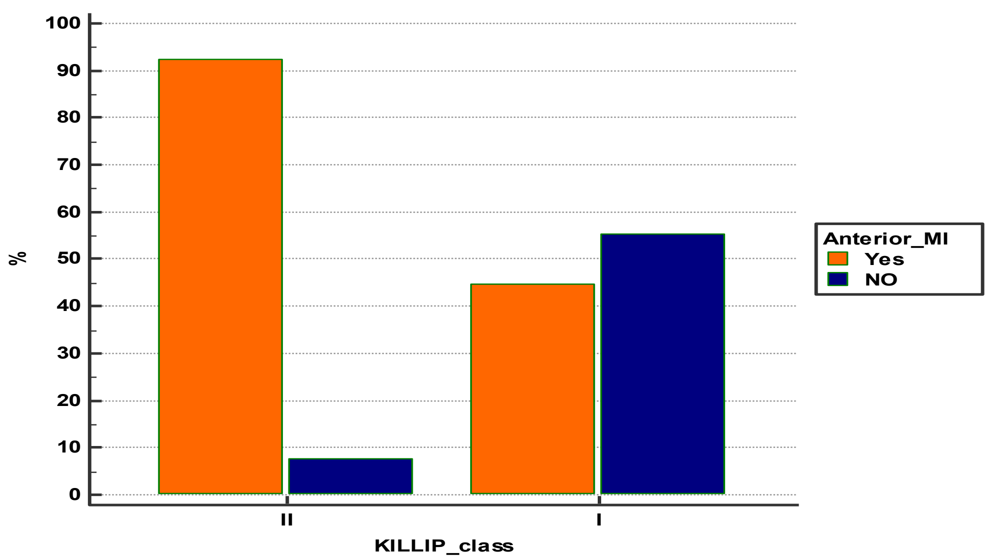


Supplementary Figure11: IRA types in percentage of patients with reference to the clinical assessment following the Killip classification (Class I, and Class II) .



Supplementary Figure12: Distribution of the Killip Class I and Class II in the patients with reference to the anterior myocardial infarction.

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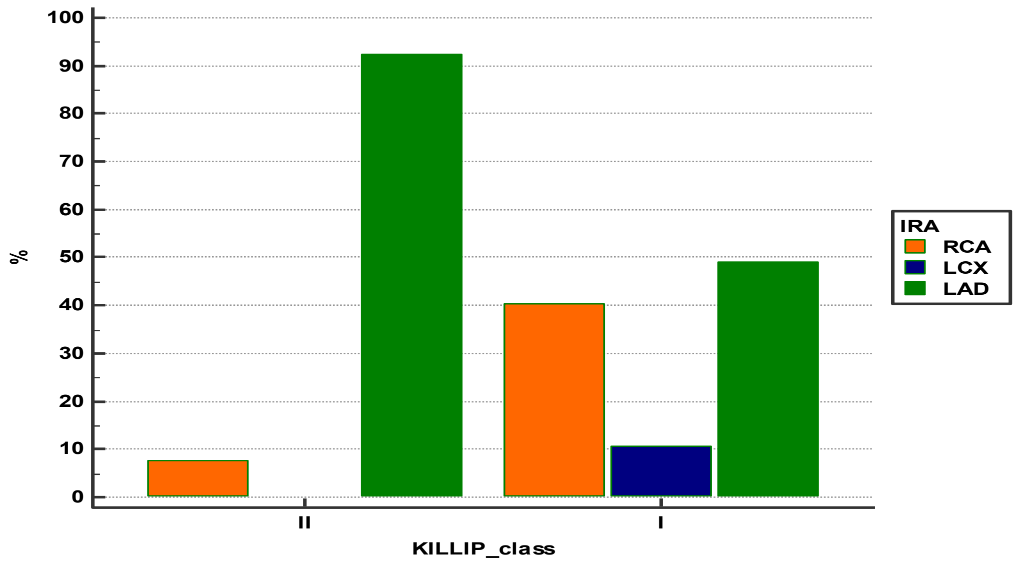
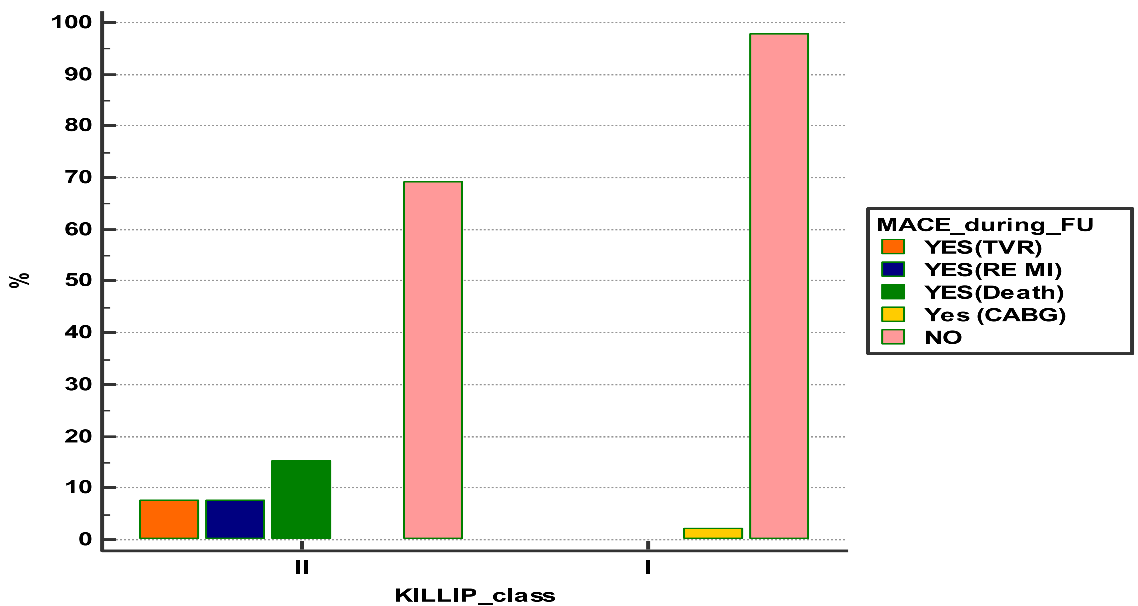


Supplementary Figure13: Distribution of the Killip Class I and Class II in the patients with reference to the IRA types.



Supplementary Figure14: Distribution of the Killip Class I and Class II in the patients with reference to the Major Adverse Cardiovascular Events(MACE) assessment during follow up .

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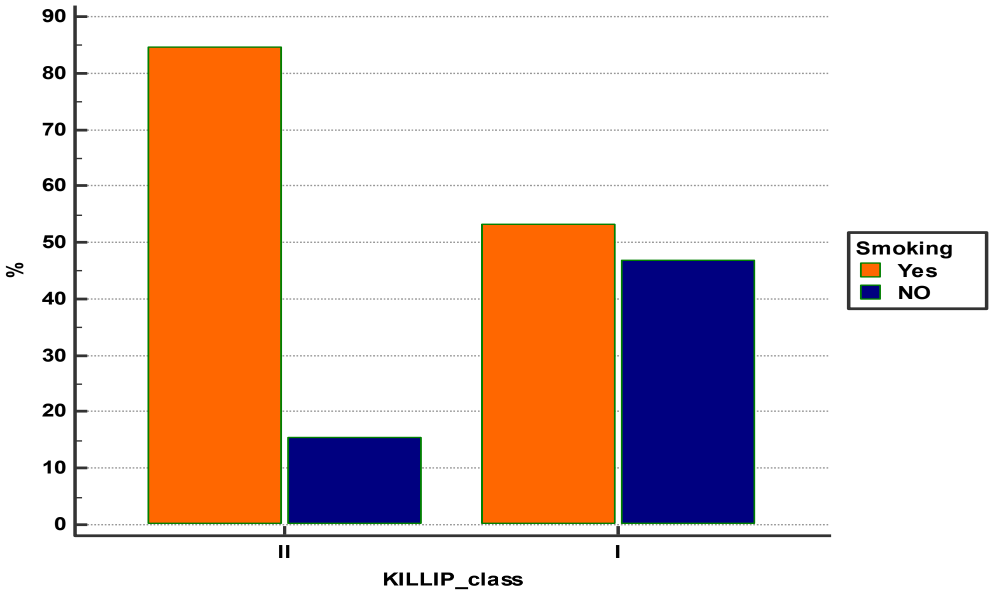
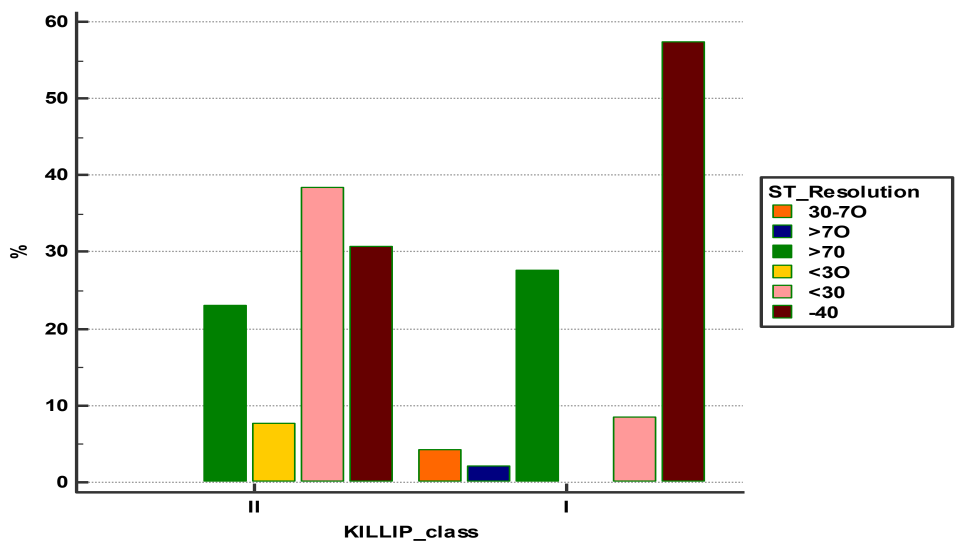


Supplementary Figure15: Distribution of the Killip Class I and Class II in the patients with reference to their smoking habits.



Supplementary Figure16: Distribution of the Killip Class I and Class II in the patients with reference to the ST resolution.

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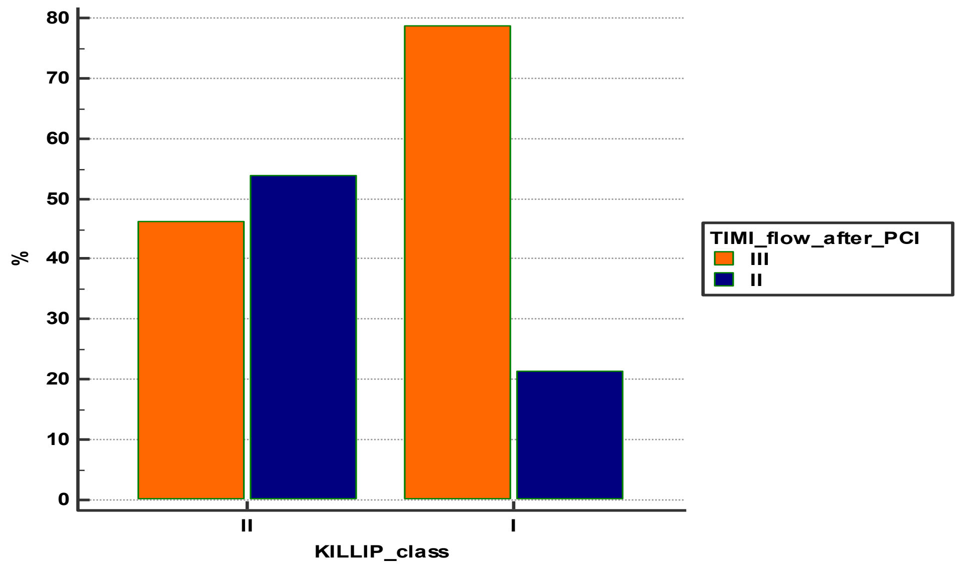
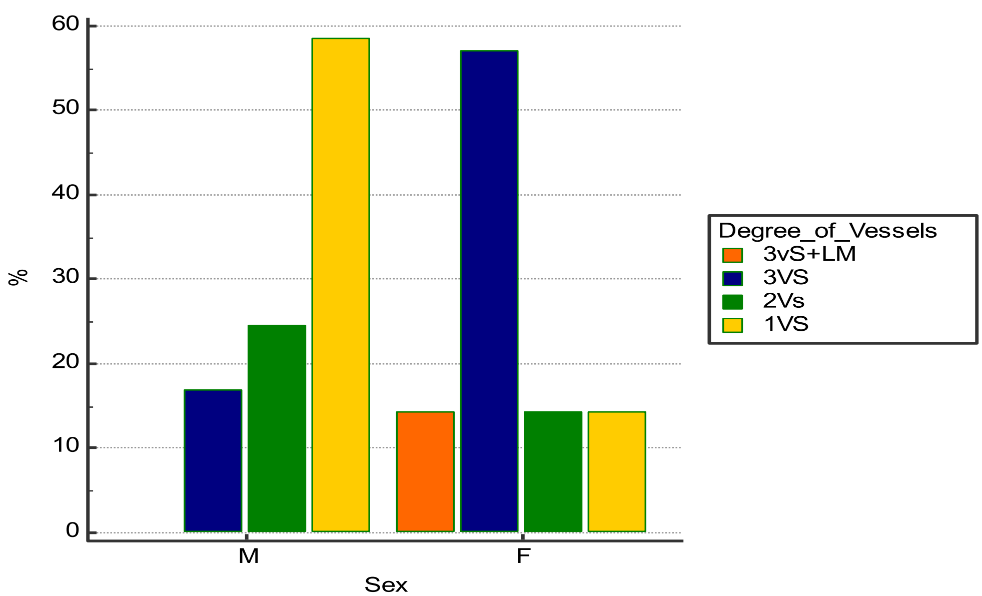


Supplementary Figure17: Distribution of the Killip Class I and Class II in the patients with reference to the Thrombolysis in Myocardial Infarction (TIMI) flow post PCI.



Supplementary Figure18: Distribution of the gender of the patients with reference to the degree of vessels.

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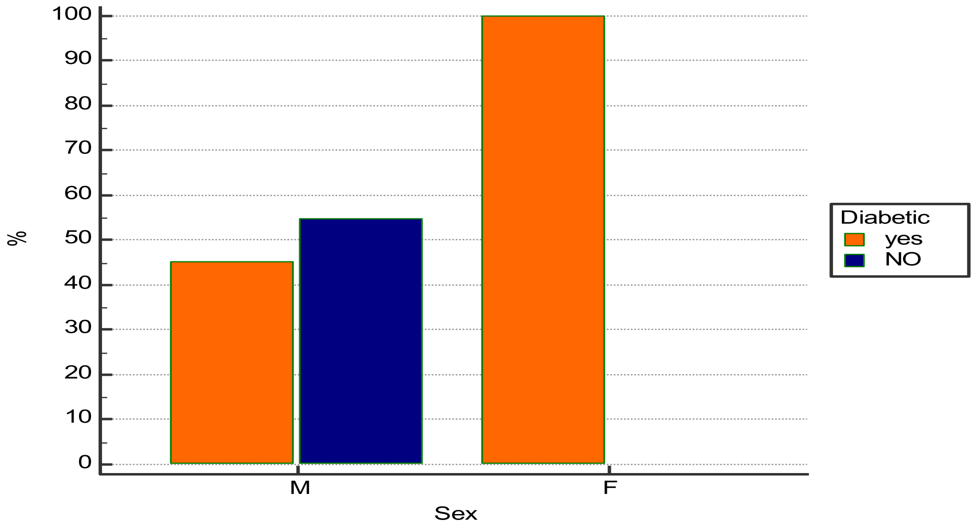
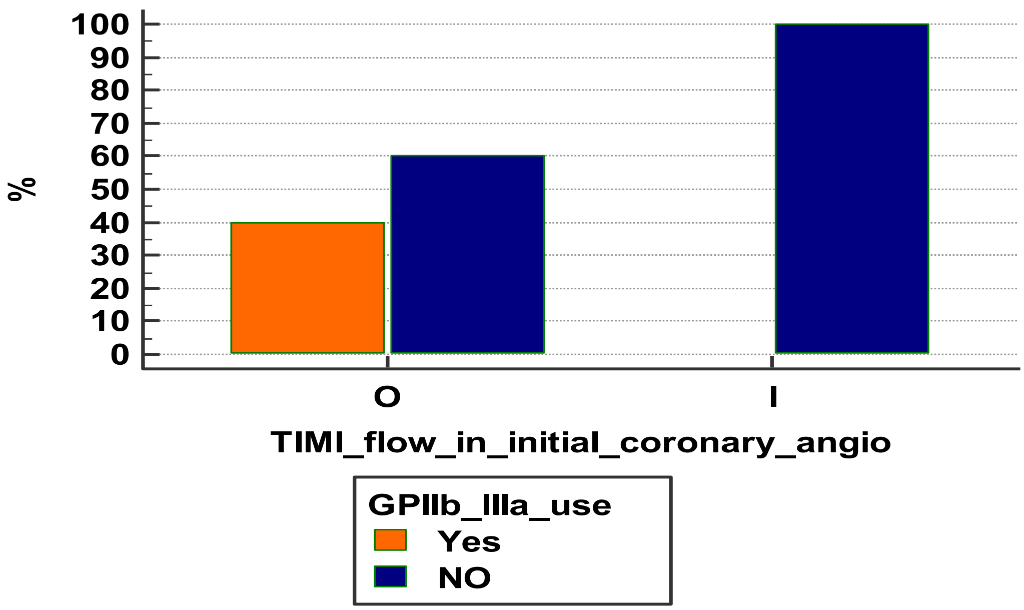


Supplementary Figure19: Distribution patients' gender and its significant association with diabetes.



Supplementary Figure20: Recorded Thrombolysis in Myocardial Infarction (TIMI) flow during the initial coronary angiogram and its association with the usage of the glycoprotein inhibitors (IIb and IIa)

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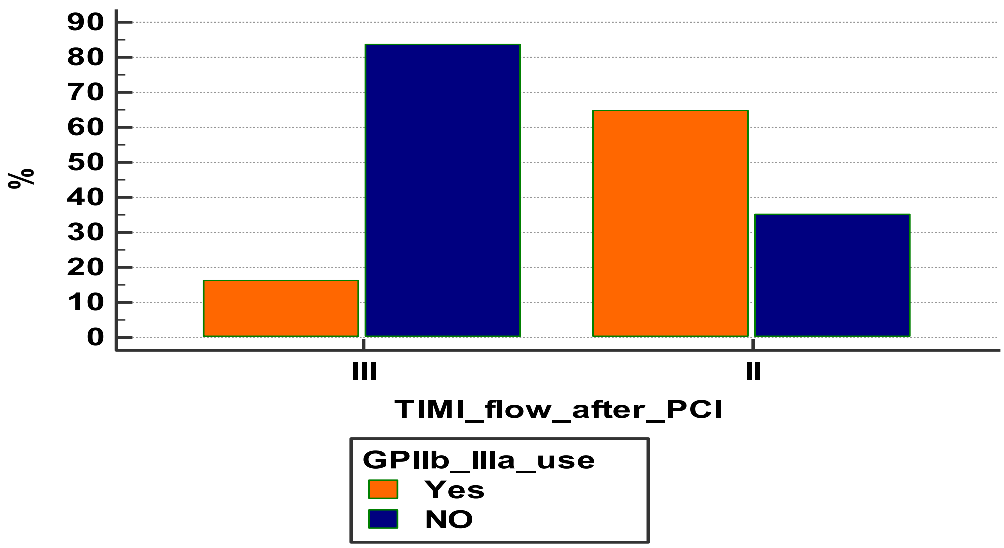
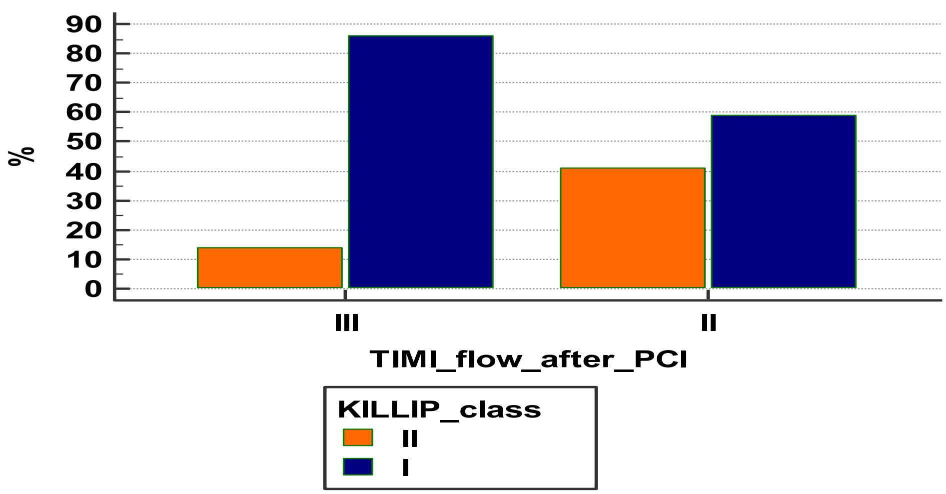


Supplementary Figure21: Recorded Thrombolysis in Myocardial Infarction (TIMI) flow after the PCI surgery and its association with the usage of the glycoprotein inhibitors (IIb and IIa).



Supplementary Figure22: Recorded Thrombolysis in Myocardial Infarction (TIMI) flow after the PCI surgery and its association with the assessment outcome of Killip Class (I and II) to understand the risk factors of mortality of the patients.

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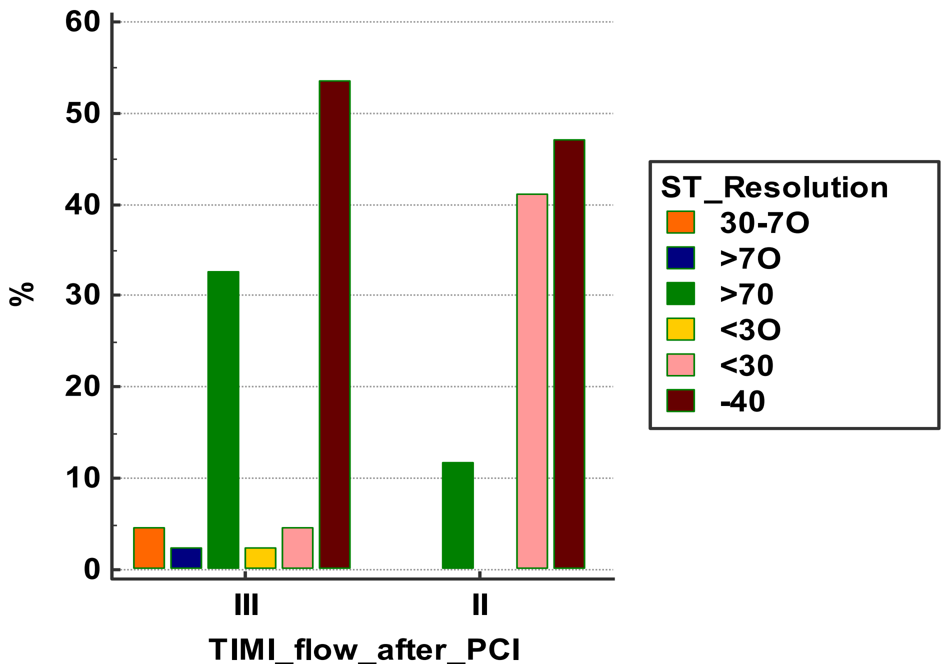

Supplementary Figure23: Recorded Thrombolysis in Myocardial Infarction (TIMI) flow after the PCI surgery and its association with the assessment outcome of ST resolution at post operative stage to understand the risk factors of mortality of the patients.