SHORT COMMUNICATION

Same-day discharge after coronary angioplasty: data from a single-center registry

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Introduction Same-day discharge after coronary angioplasty is a rapidly developing approach that significantly reduces hospital costs. The safety of outpatient percutaneous coronary intervention (PCI) in selected patients has been confirmed in several randomized trials with different entrance criteria and methodology.[1-3] In practice, patient selection criteria for same-day discharge PCI are not yet clearly established. Moreover, they vary significantly among centers and may influence patient safety.[1-5]

The aim of the study was to evaluate the results and safety of same-day discharge PCI performed according to our self-developed criteria for patient selection and management protocol.

Methods This prospective registry included consecutive patients subjected to a PCI at a one-day coronary invasive unit, Institute of Cardiology, Warsaw, Poland. The study group included patients who were admitted and discharged on the same day. The control group comprised the remaining patients, who were admitted for an overnight or longer stay after PCI for various reasons. As all patients were initially referred for same-day discharge PCI, there were no left main, chronic total occlusion, or bypass PCI procedures. All PCIs were performed on the day of admission via the radial approach.

The selection of patients to the study group was performed in 3 steps. Step 1 was to identify prehospital exclusion criteria. We excluded patients with unstable clinical condition, planned PCI of the left main coronary artery, coronary baypass graft, or chronic total occlusion, left ventricular ejection fraction (LVEF) of less than 30%, New York Heart Association class III or IV, planned femoral access, glomerular filtration rate lower than 50 ml/min, distant place of residence (transport >60 minutes), and those who refused to be discharged early for psychological or social reasons.

Step 2 consisted in immediate evaluation of angioplasty technique and outcome on the basis of data related to the PCI procedure. At this stage, the decision not to perform same-day discharge PCI and to refer the patient for an overnight hospital stay was made if one of the following occurred: shift to the femoral approach, ischemic complications (major adverse cardiac events, target vessel or side branch occlusion, dissection not covered by stent), or unexpected high complexity of the procedure.

After the PCI, the patient rested in an armchair in a sitting or reclining position. Each patient received 1000-ml fluid infusion, and his or her vital functions were evaluated by a heart monitor and experienced medical staff.

Step 3 was the final decision on discharge, which was made 4 to 6 hours after uncomplicated angioplasty. The discharge criteria were as follows: stable clinical condition, no ischemic changes on electrocardiogram, and no hematoma after the removal of radial compression. Each early-discharge decision was accepted by the patient and the performing physician. A follow-up telephone interview was carried out at 30 days by an experienced medical assistant.

The study was approved by the local ethics committee (decision no., 1785), and each patient provided written informed consent to participate in the study.

Statistical analysis Quantitative variables were expressed as mean (SD) and range and were compared with the unpaired *t* test. Qualitative variables were reported as counts and percentages and were compared using the independent

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χ^2 test or Fisher exact test, as appropriate. Univariable and multivariable stepwise binary logistic regression analyses were used to determine independent predictors of overnight hospital stay. All tests were 2-sided and a *P* value of less than 0.05 was considered significant. Statistical analyses were performed with the SAS statistical package (SAS Institute Inc., Cary, North Carolina, United States).

Results

Patients and procedure During the study, 821 diagnostic and 180 therapeutic procedures were performed between January 2018 and October 2019. The clinical and angiographic characteristics of 92 patients included in the study group and 76 controls are shown in TABLE 1. Patients were referred for an overnight stay after PCI for the following reasons: nonmedical (distant place of residence, no caregiver, patient preference), 26 patients; glomerular filtration rate lower than 50 ml/min, 4 patients; shift to the femoral approach, 3 patients; cardiac ischemic complications, 6 patients; the performing physician's decision due to unexpected high complexity of PCI, 39 patients.

In a multivariable binary logistic regression analysis, 2 independent predictors of overnight stay were identified: complex PCI and LVEF. Patients with complex PCI procedures had a significantly lower chance of same-day discharge PCI (odds ratio [OR], 0.24; 95% CI, 0.12–0.46; *P* <0.001) and those with higher LVEF had a greater chance of same-day discharge (OR, 1.27; 95% CI, 1.02–1.58; *P* = 0.03). Each 5% of better LVEF increased the chance of same-day discharge by 27%.

Follow-up Data from 30-day follow-up were obtained from all 92 patients undergoing same-day discharge PCI. Clinical symptoms improved in 84 patients (91.3%). Eighty-nine patients (96.7%) found discharge on the same day after the PCI to be safe and more convenient. Noncardiac complications were reported in 3 patients (3.3%). Two patients (2.2%) were referred for ambulatory consultations because of a small hematoma at the access site. One patient (1.1%) required hospitalization due to neurologic symptoms that occurred also before PCI, and a subsequent diagnosis confirmed their neurologic origin. All-cause readmission was reported in 2 patients (2.2%): in one patient for noncardiac and in the other for cardiac reasons.

TABLE 1 Clinical and procedural characteristics of patients with same-day discharge and overnight hospital stay after percutaneous coronary intervention

Parameter	Same-day discharge (n = 92)	Overnight stay (n = 78)	*P* value
Patient characteristics			
Age, y, mean (SD)	65.9 (9.3)	67.1 (10.7)	0.43
Age, y, range	46–88	35–87	–
Male sex	67 (72.8)	56 (71.8)	0.88
LVEF, %, mean (SD)	57.2 (6.6)	54.5 (8.5)	0.02
LVEF, %, range	35–70	28–70	–
GFR, ml/min, mean (SD)	65.2 (11.8)	67.1 (14.4)	0.34
Diabetes	27 (29.4)	25 (32.1)	0.70
Previous MI	26 (28.3)	32 (41.0)	0.08
Multivessel disease	50 (54.4)	57 (73.1)	0.01
Procedural characteristics			
Ad-hoc PCI	63 (68.5)	43 (55.1)	0.07
Use of iFR/FFR/IVUS	15 (16.3)	11 (14.3)	0.69
Complex PCI[a]	36 (39.1)	57 (73.1)	<0.001
Stents, n, mean (SD)	1.3 (0.6)	1.5 (0.8)	0.08
Total stent length, mm, mean (SD)	20.9 (9.7)	26.9 (17.0)	0.005

Data are presented as number (percentage) of patients unless otherwise indicated.

a Bifurcations, mulivessel PCI, 3-vessel disease

Abbreviations: FFR, fractional flow reserve; GFR, glomerular filtration rate; iFR, instantaneous wave free ratio; IVUS, intravascular ultrasound; LVEF, left ventricular ejection fraction; MI, myocardial infarction; non-STEMI, non–ST-segment elevation myocardial infarction; PCI, percutaneous coronary intervention; STEMI, ST-segment elevation myocardial infarction

Cardiac events during follow-up We did not observe death, ST-segment elevation myocardial infarction (STEMI), or urgent revascularization in patients undergoing same-day discharge PCI. One patient (1.1%) had non-STEMI. He was admitted to the hospital on the second day following the procedure due to chest pain and increased troponin levels. Coronary angiography revealed an occlusion of a small side branch, and the patient was discharged on the third day after normalization of troponin levels and without any need for repeated PCI. One patient (1.1%) required a nonplanned ambulatory consultation because of chest discomfort and high blood pressure. He had no ischemic changes on electrocardiogram, and troponin levels were not elevated.

Discussion Analysis of post-angioplasty complications has shown that early complications, if any, manifest themselves during the first 6 hours after the procedure. A period between 6 and 24 hours is almost free of unexpected events and is called a "honeymoon" after PCI.[6] Based on these data and wide use of the radial approach, the number of same-day discharge PCI procedures and that of performing centers has been growing. However, the key question remains of which patients can safely undergo such a procedure. This issue was not addressed in the 2018 European guidelines on myocardial revascularization.[4] Córdoba-Soriano et al,[3] in 533 patients from a multicenter Spanish registry of outpatient PCI, reported 3 major adverse events (0.56%) and 8 readmissions (1.5%) during the 30-day follow-up. The data of 169 623 patients included in the British Cardiovascular Intervention Society registry clearly show that the number of same-day discharge PCI procedures has been increasing and is not associated with a higher complication rate.[7] The 30-day mortality related to same-day discharge PCI in the registry was below 0.5%. Similarly, Amin et al[8] analyzed a database from 493 hospitals (672 470 PCIs) in the United States and found that same-day discharge PCI procedures were not associated with a higher risk of death, bleeding, myocardial infarction, or acute kidney injury at 30, 90, and 365 days.

To the best of my knowledge, this is the first paper reporting data on same-day discharge PCI in Poland. The only previous report included patients from an American center.[9] In the present study, unlike in many other centers, we included not only lower-risk patients but also those at moderate risk (no age limit, multivessel disease, complex PCI procedures; TABLE 1). The present study, with the low rate of events at 30 days and a favorable opinion of patients, is an important contribution to the discussion in this field, as an increasing heterogeneity in the discharge practice has been observed.[3,7,8,10]

Limitations It is a preliminary report and an important limitation is a small study group, especially in the context of low event rates. A comparison of patients undergoing same-day discharge PCI with those who stayed overnight after the procedure is controversial as patients referred for longer follow-up should represent a higher-risk group.[7] According to numerous authors, the rate of 30-day mortality and major adverse cardiac events in patients undergoing same-day discharge PCI should not exceed 1%, and of readmission, 5%, as reported in risk models and large multicenter registries.[5,7,8,10]

Conclusions The first conclusion from this study is that same-day discharge coronary angioplasty is feasible in the Polish healthcare system and is reimbursed like an overnight-stay procedure. The second conclusion is that the proposed protocol of patient selection criteria and management for same-day discharge PCI is safe and the 30-day event rate remains low.

ARTICLE INFORMATION

CONFLICT OF INTEREST None declared.

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