

Same-Day-Discharge vs Next-Day-Discharge after Percutaneous Coronary Intervention

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Abstract

Aim

The aim of this study is to investigate whether same-day-discharge is a safe option for patients after percutaneous coronary intervention (PCI).

Methods

A retrospective observational study compared same-day-discharge and next-day-discharge patients from a single centre, analysing factors such as type of admission, procedural complexity, incidence of major peri- and post-procedure complications, re-hospitalization rate and clinical outcomes at follow-up. A total of 97 patients were enrolled in this study. The median age of the patients was 68.7 in the SDD group and 66.7 in the NDD one. 83% (n=41) of SDD patients were male. Similarly, 83% (n=39) of NDD were male.

All the procedures were performed in the period between the 1st of June 2020 and the 31st of December 2020. All the patients were followed in cardiology out-patient clinics for at least 9 months, and up to 13 months, post procedure.

The decision of whether a patient was a candidate for same-day-discharge or next-day-discharge lied with the consultant responsible for each case.

Results

The results described in this paper showed that if no major complications arise within the first 6 hours from the procedure, the incidence of post-procedure complications, re-hospitalization rate and adverse cardiovascular events are similar among the same-day and next-day-discharge patients.

Discussion

This study provides data that could encourage discharging patients on the same day of their PCI if they have not had a complication within 6 hours post-procedure.

To our knowledge, this study is the first one to include both elective and emergency cases, as well as procedures performed via access sites other than the radial artery.

Introduction

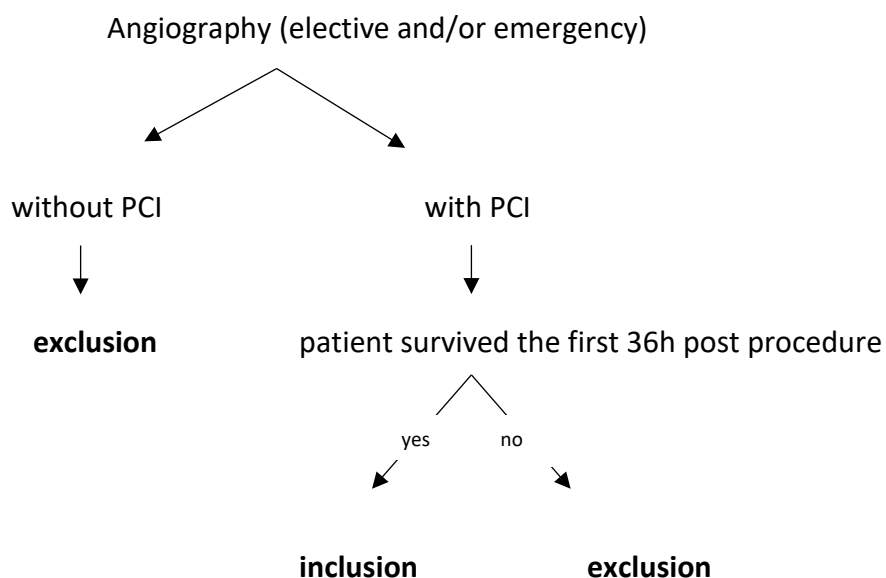
PCI is a widely used procedure which is often favoured over coronary artery bypass surgery due to the increasing prevalence of coronary artery disease in ageing population as well as refining techniques and reduction in procedural complications. A number of studies have been conducted; many of these have focused on whether same-day-discharge could be a safe option for patients based on clinical outcomes while other studies have focused on the financial benefits resulting from performing same-day-discharge procedures. The 2021 ACC Expert Decision Pathway on same-day-discharge after PCI emphasized that SDD after PCI is associated with cost savings. In estimation, \$200-500 million could be saved annually in the USA by discharging 50% of PCI patients on the same day of procedure. This practice could therefore lead to reduced economic medical burden for health systems as well as increased patient satisfaction due to shortened length of stay in hospital^{1,2}.

This paper has the objective of investigating the safety of same-day-discharge in patients following percutaneous coronary intervention procedures.

Methods

This paper is a retrospective observational study that compares two groups of patients after percutaneous coronary intervention. The first study group is represented by same-day-discharge (SDD) patients, therefore those patients that had been discharged on the same day of their procedure. The second group instead consists of next-day-discharge (NDD) patients, therefore it includes those patients that had an overnight stay in hospital and were discharged the day after their procedure.

A total of 403 percutaneous coronary interventions were performed between the 1st of June 2020 and the 31st of December 2020. 50 patients were discharged home on the same day of their procedure while 47 patients were discharged the following day. The rest of the cases had an hospitalisation time longer than 36 hours. This translates into approx. 25% (n=97) of all PCI cases being either SDD or NDD cases.



Graph 1: Inclusion and exclusion criteria of the study

Results

When considering the patient population of the same-day-discharge cases, 83% (n=41) of patients were male and the remaining 17% (n=9) were female.

When analysing the prevalent gender in the patients belonging to the next-day-discharge group, the data showed very similar numbers to what it was seen in the SDD group. 17% (n=8) of the patients were female and 83% (n=39) were male.

In a similar fashion, also the median age of the patients belonging to the two analysed groups did not show great differences. The median age of the SDD patients was 68.7 while the median age of the NDD patients was 66.7.

This study focused on comparing and analysing a number of different patient and case characteristics in order to determine whether there were objective differences in the clinical outcome for post-PCI patients following same-day-discharge or next-day-discharge. Some of the characteristics analysed were admission type (elective vs emergency cases), access site (radial vs femoral, right vs left), procedural complexity (single vs multi-vessel disease), number of stents inserted, post-procedure complications, re-hospitalisation rate, follow-up and clinical findings.

Of the 47 next day discharge patients, 39 were performed electively. The remaining 8 NDD admissions were acute coronary syndrome (ACS) cases. This means that 83% (n=39) of the

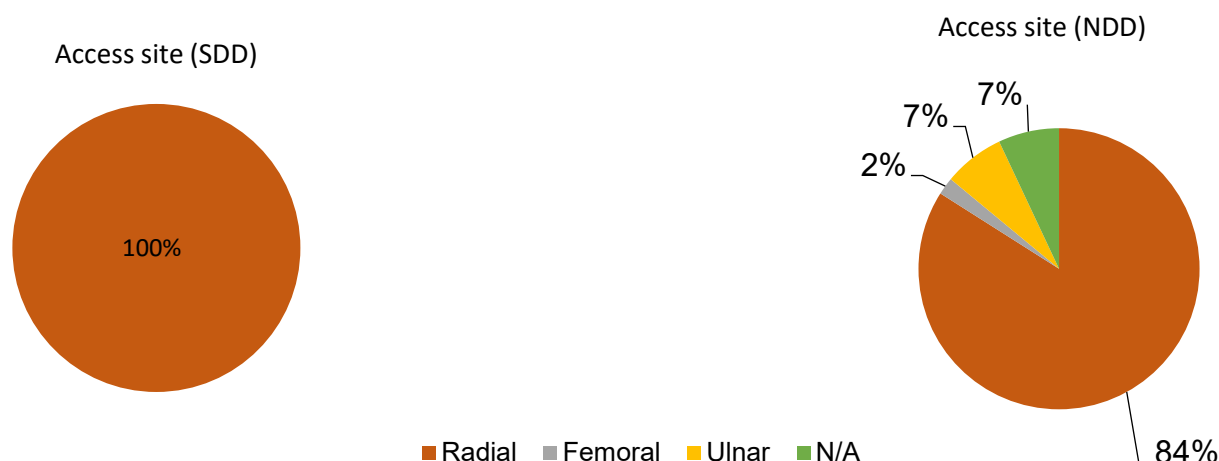
NDD patients were elective cases while 17% (n=8) of next day discharge cases were ACS ones. 7 ACS patients out of 8 were admitted with an NSTEMI while only 1 ACS patient was admitted with a STEMI.

Another feature analysed in this study is the choice of access sites used to perform percutaneous coronary intervention.

The latest guidelines recommend using the right radial access as preferred site for percutaneous coronary intervention, when suitable.

All the same-day-discharge patients whose notes were available had their PCIs performed via radial access. Of these, 80% (n=40) of cases were performed via right radial access site and 16% (n=8) via left radial one instead. Among the left radial cases, 25% (n=2) had their procedure started as right radial access but then switched to the left radial access site (4% of all same-day-discharge cases).

9% (n= 4) of NDD patients had their PCI performed via a different access site other than radial one: 1 patient through the femoral artery (left sided) and 3 via the ulnar one (2 patients from the right side and 1 from the left side). However, the majority of NDD cases were still performed via radial site (84%, n = 39). Of these, 79% (n=31) of cases were performed via the right radial artery while the remaining 21% (n=8) were performed via left radial access. The remaining percentage of NDD patients had no data for this element.



Graph 2: Access site in same-day-discharge and next-day-discharge cases.

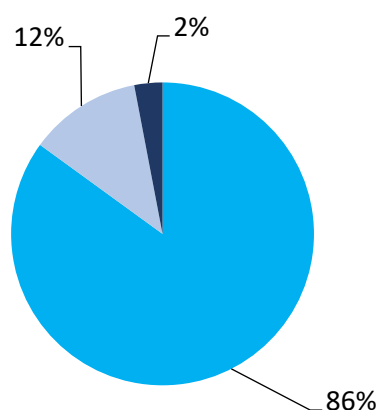
Another critical aspect analysed in this paper was the complexity of the procedures. In order to assess this, both the number of affected vessels and the number of stents inserted were considered.

Most same-day-discharge patients had a diagnosis of one-vessel-disease while a much smaller group of SDD patients had a diagnosis of multi-vessel-disease, 86% (n=43) vs 12% (n=6). The remaining 2% of patients (n=1) could not be assessed for this characteristic due to insufficient data. A detailed analysis of the patients in relation to this element was performed and showed that 78% (n=39) of all the same-day-discharge cases involved only one-vessel disease and required the insertion of only one stent, 8% (n=4) of all the same-day-discharge cases involved only one-vessel-disease but required the insertion of two stents, 4% (n=2) of SDD had a two-vessel-disease that required the insertion of two stents, 8% of SDD (n=4) had a two-vessel-disease requiring the insertion of 3 stents, no same-day-discharge patients had a three-vessel-disease (3VD) diagnosis, therefore all multi-vessel-disease cases were 2-vessel-disease cases.

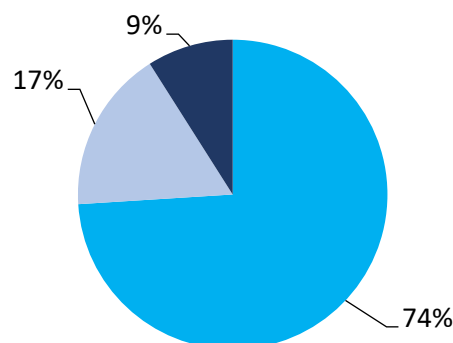
When analysing the group of the next day discharge individuals in relation to this element, there was a trend towards higher complexity. \approx 74% (n=35) of NDD cases involved single-vessel-disease diagnoses, \approx 17% of NDD cases (n=8) involved two-vessel-disease diagnoses and no next-day-discharge patients were a case of three-vessel-disease (3VD).

The missing data for NDD (n=4) are due to unavailable details.

Procedural Complexity (SDD)



Procedural Complexity (NDD)



Graph 3: Procedural complexity – prevalence of single vessel disease and multi-vessel disease cases.

Finally, the rate of post-procedure complications, re-hospitalisation and follow-up findings were considered.

A post-procedure follow-up timeframe of 9 to 13 months was assessed.

All patients involved in this study (same-day-discharge and next-day-discharge) had their first out-patient follow-up appointment at 3 months from their PCI. No same-day-discharge cases needed re-hospitalization for any cause and no same-day-discharge cases had one or more major post-procedure and/or peri-procedure complications.

The major peri- and post-procedure complications considered in this study were cerebrovascular events (stroke and/or TIA), acute kidney injury (AKI), new onset of arrhythmia, anticoagulation-associated bleeding, hypersensitivity reactions and acute peripheral artery disease (PAD).

All patients, including those ones discharged home on the same day of their procedure, had an in-hospital post-procedure monitoring time of at least 6 hours.

Discussion

This retrospective observational study identifies important features within the two groups studied. The median age and gender distribution of the patients belonging to the two analysed groups were notably similar. This common background provides solid foundation for accurate data interpretation and analysis. The rate of hospitalization, clinical outcome and post-procedural complications were overall similar in both groups, even though features such as type of admission (elective vs ACS), access site (radial vs femoral vs ulnar, right vs left) and complexity of the procedure (single-vessel vs multi-vessel and number of stents) showed some differences across the two groups of patients.

It's essential to remark that the percentage of single-vessel-disease cases was higher in the SDD patients than in the NDD ones. In addition, the SDD cases required the insertion of less stents for single procedure. These data appear to suggest that the complexity of the same-day-discharge cases was lower compared to the complexity of the next-day-discharge cases. However, the percentage of post-procedure complications, re-hospitalization rate and clinical outcome at follow-up was overall similar in both NDD and SDD groups. Thus, aiming to discharge a specific cohort of patients on the same day of their procedure appears to be reasonable.

The advantages that could result from same-day-discharges rather than next-day-discharges are numerous, including cost savings and patient satisfaction.

This study also shows that there is no significant difference in the procedure-related outcomes of the analysed population group in the short- and/or intermediate-term after PCI when no complications arose in the first 6 hours post-procedure.

The use of same-day-discharge after percutaneous coronary intervention is still not fully integrated in clinical practice. This study provides additional data that could encourage performing same-day-cases for certain patients undergoing elective PCIs with no complications within 6 hours from their procedure.

This study does not encourage same-day-discharge practice in patients with a diagnosis of STEMI, NSTEMI and unstable angina.

Declarations Of Conflicts Interest:

None declared.

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References:

1. Sahoo S.K., Vijayvergiya R., Kaur N., et al. "Feasibility and safety of same-day discharge after percutaneous coronary intervention: a tertiary center experience". *Am J Cardiovasc Dis.* 2020; 10(4): 306-316
2. Rao S.V., Vidovich M.I., Gilchrist I.C., et al. "2021 ACC Expert Consensus Decision Pathway on Same-Day Discharge After Percutaneous Coronary Intervention: A Report of the American College of Cardiology Solution Set Oversight Committee". *J Am Coll Cardiol* 2021; Jan 7: [Epub ahead of print].