Outcomes of nurse-led clinic for patients treated with percutaneous coronary intervention: A retrospective analysis

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ABSTRACT

Background: With an increasing prevalence of coronary heart disease, secondary prevention forms a major cornerstone of management. A dedicated nurse-led clinic for patients post percutaneous coronary intervention (PCI) offers a great opportunity to address risk factors in order to reduce cardiovascular events.
Purpose: To determine the impact of a nurse-led clinic follow up of patients post PCI in relation to the 30 day mortality rate and re-admission, and patient satisfaction. Risk factor assessment, compliance with dual anti-platelet therapy (DAPT), and interventions at the clinic visit were also assessed.
Methods: A retrospective review of parameters recorded at clinic appointments from January 2015–December 2017. The data of patients were examined for baseline characteristics, risk factor assessment, and interventions at the clinic visit. Thirty day mortality and re-admission rates and patient satisfaction were major outcomes.
Results: 1325 individual patient records were retrospectively reviewed in our clinic. Mean age was 64 and 78% were males. The indications for PCI were STEMI (22.7%), NSTEMI (21.9%), and unstable and stable angina (43.1%). 5 patients (0.4%) died and 132 patients (10%) were re-admitted within 30 days after the follow-up visit. However, only 24 (1.8%) of the re-admissions were due to cardiac reasons. At the clinic appointment, 852 (64.3%) patients had non-pharmacological intervention and 473 (35.7%) patients had a pharmacological intervention. 712 (53.7%) patients had LDL-C above target and their statin therapy was amended accordingly.
Conclusion: Nurse-led PCI clinics provide satisfactory assessment and management of risk factors achieving high patient satisfaction rates without increased risk of poor outcomes.

1. Introduction

Coronary artery disease (CAD) is a major cause of mortality and morbidity in the developed world (Sanchis-Gomar, Perez-Quilis, Leischik, et al., 2016). Despite a reduction in CAD-associated mortality rates in developed countries, CAD is still a leading cause of death globally (Lloyd-Jones, Adams, Brown, et al., 2010; Nichols, Townsend, Scarborough, et al., 2014). Moreover, the global burden of CAD is only expected to increase with time (Dalen, Alpert, Goldberg, et al., 2014).

Since the introduction of percutaneous balloon angioplasty over three decades ago, percutaneous coronary intervention (PCI) has evolved significantly and has led to considerable improvement in the management of obstructive CAD (Bennett & Dubois, 2013). PCI not only improves symptoms of CAD, but also leads to a better long-term prognosis in the acute setting (Gąsior, Desperak, Gierlaszyńska, et al., 2013). Although PCI enables a quick recovery and earlier hospital discharge,

treatment of CAD does not cease with a successful interventional procedure. Follow-up forms a critical part of management post-PCI (Valaker, Norekvål, Råholm, et al., 2017). Control of risk factors by lifestyle modification and optimal pharmacotherapy is an integral part of management of CAD (Valaker et al., 2017). Post PCI follow up facilitates essential clinical assessment as well as counselling of patients regarding lifestyle changes and risk factors modifications (Jankowski, Czarnecka, Wolfshaut-Wolak, et al., 2015). Additionally, pharmacological therapy can be altered and if any early complications are present they can be promptly detected allowing treatment to be initiated (Jankowski et al., 2015). The main interventions include smoking cessation, optimum blood pressure control, weight management and encouragement of regular exercise (Piepoli, Hoes, Agewall, et al., 2016).

An effective way of ensuring proper clinical follow-up without putting excessive strain on cardiology residents and physicians is by

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utilising nurse-led clinics. A clinical nurse specialist and/or nurse practitioners can be the perfect link between the physicians and the patients. Our study was aimed at assessing the rate of 30 day mortality, re-admission and satisfaction of patients who were followed up in our nurse-led PCI clinic.

2. Research methods

2.1. Design

This was a retrospective observational study.

2.2. Sample

1325 patients who underwent PCI at University Hospital Limerick and were subsequently reviewed 6 weeks later in the nurse-led clinic between January 2015 to December 2017.

2.3. Outcomes

The major outcomes were 30-day readmission rate, 30-day mortality, and patient satisfaction. Risk factor assessment, compliance with dual antiplatelet therapy (DAPT), non-pharmacological and pharmacological interventions at the clinic visit were also assessed.

2.4. Procedures

The follow-up visit in the nurse-led clinic was scheduled for 6 weeks after the procedure. Assessment of patients at this clinic was performed by specialist cardiology nurses. A retrospective review of the parameters recorded at the clinic was carried out and completed in June 2018. These parameters included age, gender, smoking status, family history of ischaemic heart disease (IHD), diabetic status, the indication for PCI, lipid profile, use of beta-blocker therapy, statin therapy and angiotensin converting enzyme inhibitor (ACEI) or angiotensin receptor blocker (ARB) therapy. 50 patients were randomly selected and completed a questionnaire consisting of five questions to assess their satisfaction with the nurse-led PCI clinic. The first four questions were categorical with patients being required to answer yes or no. These enquired whether patients were happy to be reviewed in the clinic by a nurse, whether they were happy with the length of the clinic appointment, if patients were satisfied with information that they received and whether they felt that all their concerns had been addressed appropriately. The fifth and final question was a scaled variable which requested patients to rate their overall experience of the nurse led PCI clinic on a scale from 1 to 10 with a rating of 10 representing excellence.

2.5. Analysis

Data were analysed using IBM SPSS statistics version 20. Ethical approval was received from the HSE Mid-West ethics committee prior to commencing this study and verbal consent obtained from patients who completed the questionnaire.

3. Results

3.1. Baseline demographics

Out of the 1325 patients, 1037 (78.3%) were male. The mean age was 64.8 ± 12.29 years. At 74.9%, most of our patients had a positive family history of IHD. 67.8%of patients had never smoked and 23.3% were ex-smokers. There were relatively few patients who were current smokers at 8.9% (Table 1). The most common indication for PCI in the study group was stable and unstable angina which was seen in 43.1% of patients. 22.8% of patients had ST segment-elevation myocardial

Table 1

Characteristics of patients attending the nurse led percutaneous coronary intervention (PCI) clinic and study outcomes.

Characteristics of patients	
Variable	PCI clinic patients (n = 1325)
Mean age (yrs)	64.8 ± 29.3SD
Male (%)	78.3
Non-smokers (%)	67.8
Ex-smokers (%)	23.3
Smokers (%)	8.9
Positive family history of ischaemic heart disease (%)	74.9
Diabetic status	
Known diabetes mellitus (%)	13.7
New diagnosis of diabetes mellitus (%)	5.7
Indication for PCI	
STEMI[a] (%)	22.8
NSTEMI[b] (%)	21.9
Stable and unstable angina (%)	43.1
Other (%)	12.2
Target lipid profile status	
TC[c] < 4.5 mmol/L (%)	11.7
LDL[d] < 1.8 mmol/L (%)	46.3
Compliant with DAPT[e] at 6 weeks (%)	99.3
Interventions implemented at PCI clinic	
Pharmacological intervention (%)	35.7
Non-pharmacological intervention (%)	57.6
Use of beta blocker therapy at PCI clinic (%)	82.5
Use of ACEi[f] or ARB[g] therapy at PCI clinic (%)	77.7
Use of statin therapy at PCI clinic (%)	96.4
30 day mortality rate (%)	0.4
30 day total readmission rate (%)	10
30 day cardiac readmission rate (% of total patients)	1.8

[a] ST-segment elevation myocardial infarction.
[b] Non-ST-segment elevation myocardial infarction.
[c] Total cholesterol.
[d] Low density lipoprotein.
[e] Dual antiplatelet therapy.
[f] Angiotensin converting enzyme inhibitor.
[g] Angiotensin receptor blocker.

infarction (STEMI), whereas 21.9% presented with non-STEMI (NSTEMI). The remaining 12.2% of patients underwent PCI for other reasons (Table 1).

3.2. Risk factor assessment

182 patients or 13.7% had a past medical history of diabetes mellitus and were being treated with hypoglycaemic drugs at the time of follow-up. 5.7% of our cohort was newly diagnosed with diabetes at the nurse led PCI clinic on the basis of their recent HbA1C level and they were instantly referred to endocrinology. The majority of patients (88.3%) had total cholesterol (TC) above the recommended target of 4.5 mmol/l (170 mg/dl) while 53.7% of patients had LDL cholesterol above the target of 1.8 mmol/l (70 mg/dl). Nearly all patients at 96.4% were receiving statin therapy at their follow up in the PCI clinic the dose of which was amended according to the level of their TC and LDL-C (Table 1).

3.3. Compliance with antiplatelet therapy

Patients were assessed for their compliance with the DAPT prescribed during their admission for PCI. With 99.3% compliance, almost every patient was compliant with their DAPT regimen at six weeks (Table 1).

3.4. Interventions at the clinic visit

At the PCI clinic appointment, 82.5% of our cohort was receiving betablocker therapy and 77.7% were taking ACEI or ARB. Changes in medical management were implemented for some of our patients at this clinic with 35.7% of patients having pharmacological intervention in the form of change in dosage or addition or discontinuation of medications. The remaining 64.3% were offered lifestyle advice or non-pharmacological intervention which included information on diet, exercise and smoking cessation (Table 1).

3.5. Major outcomes

3.5.1. Mortality and readmission rates

Only 5 patients (0.4%) died within 30 days after their clinic visit, all from non-cardiac causes. Of the 1325 patients, 132 patients (10%) had to be readmitted to the hospital within 30 days after the follow-up visit. However, only 24 of them (1.8%) were admitted due to cardiac reasons and only 15 (1.1%) underwent repeat revascularisation (Table 1).

3.5.2. Patient satisfaction

All 50 patients who completed the survey reported they were happy to follow up in the nurse-led clinic in addition to being satisfied with the length of the appointment and information received. One patient (2%) felt that their concerns were not completely addressed and one patient (2%) rated their experience of the clinic at 9 out of 10. All other patients (98%) rated their experience at 10 out of 10. Although it was not requested on the form, patients further added that the nursing staff was not only approachable and well-trained but were also knowledgeable enough to answer any queries they had.

4. Discussion

This was a large retrospective study assessing the outcomes of patients attending the nurse led PCI clinic in our centre. It is well established that CAD predominantly affects male patients and this is reflected in the data along with the association of family history. At least 44% of patients had acute coronary syndrome (ACS) as the indication for PCI. Follow up is important in any patient but is possibly even more vital in emergency ACS cases. Mortality and readmission rates are good indicators of the effectiveness of medical intervention. Our 30 day mortality post PCI clinic was very low at 0.4%. Previous large observational studies reported higher rates of 30 day mortality after PCI at 1.23%, and 3.28% for the subgroup of patients treated for STEMI (Kerr et al., 2017). The readmission rate in our study was 10% but only 1.8% was due to cardiac reasons. A higher percentage (12%) of 30 day readmission rate was reported from the United States in a national readmission database analysis of 206,869 patients post PCI (Tripathi et al., 2017). Data from the United Kingdom reported a 30 day readmission rate of 4.7% to 15.6%. In contrast to our study, the majority of these readmissions were due to cardiac related disorders (Garg, Mahmood, Olusan, et al., 2017; Kwok, Hulme, Olier, Holroyd, & Mamas, 2017).

Patient satisfaction was excellent in our study representing a success in this major aspect of patient care in general and the nurse-led PCI clinic in particular. Pottle et al. conducted a retrospective audit of 2547 nurse-led PCI follow up service appointments (Pottle, Deane, Dent, et al., 2013). Their patient satisfaction questionnaire found that over 90% of patients responded positively to the questions indicating that they were happy to be reviewed by nurses, were satisfied with the length of the clinic, found the nurses approachable, felt that the nurses had sufficient knowledge and were satisfied with the overall experience (Pottle et al., 2013). A systematic review of community based nurse led clinics found that patient satisfaction was positively influenced (Randall, Crawford, Currie, et al., 2017). Research has indicated that patients insist that it is most important that healthcare professionals

provided time to listen to them and to explain matters to them (Valaker et al., 2017). Nurses are in an excellent position to identify patient's needs and build a therapeutic relationship with patients (Valaker et al., 2017).

While randomised control trials were included in previous review articles, these reviews were for cardiac patients in general or for coronary heart disease (CHD) patients and were not specific for post-PCI patients (Page, Lockwood, & Conroy-Hiller, 2005; Schadewaldt & Schultz, 2011). A systematic review of nurse led clinics for cardiac patients suggested that care was equivalent to non-nurse managed clinics and that there was greater risk of poorer outcomes in nurse-led clinics (Schadewaldt & Schultz, 2011). This result was contrary to other published reviews of nurse led clinics. The review of nurse led clinics in patients with CHD found them to be at least as effective as general practice clinics for most outcomes and recommended their use in such patients (Page et al., 2005). Systematic review of community based nurse led clinics indicated that they had positive impact on patient outcomes (Randall et al., 2017). The previously mentioned, large retrospective study of a nurse led post-PCI clinic by Pottle et al. had shown that appropriately trained nurses were successful at conducting a follow up service for post PCI patients (Pottle et al., 2013). These clinics facilitated uniform assessment of risk factors and the patient's medical condition as well as optimisation of secondary prevention (Pottle et al., 2013). These clinic allow compliance with treatment to be monitored which is particularly important for DAPT. Although over 99% of our patients were compliant at six weeks, full 100% compliance needs to be the aspiration due to the potential risk of stent thrombosis and in-stent restenosis. Compliance with statin therapy and plasma level of TC and LDL-C were also assessed at the clinic visit as recommended by the 2016 European Society of Cardiology (ESC) guidelines (Catapano et al., 2016). While nearly all patients (96.4%) were receiving statin therapy at their follow up in the PCI clinic, only 11.7% met the ESC recommended TC target of 4.5 mmol/l (170 mg/dl) and 46.3% met the recommended LDL-C target of 1.8 mmol/l (70 mg/dl). These figures are comparable to recently published data from Germany that showed only 34.1% reached LDL-C recommended target (Dykun, Wiefhoff, Totzeck, et al., 2018).

We have reported our experience of running a nurse-led post-PCI clinic in the Midwest of Ireland and shown that such clinics can be successful. These clinics provide satisfactory assessment and management of risk factors achieving high patient satisfaction rates without increased risk of mortality or rehospitalisation. Publishing studies to report the experience of nurse-led PCI clinics could help steering committees formulate evidence to the utilisation of these clinics allowing secondary prevention to be effectively delivered where it is most needed.

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