A study analysing the new Rapid Access Chest Pain Clinic at Mater Dei Hospital, Malta

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ABSTRACT

Background

This study is a service evaluation of the new rapid access chest pain clinic (RACPC), introduced in January 2021 at Mater Dei Hospital, Malta.

Objective

To determine whether the current practices meet the needs of the local population for diagnosis and management of coronary artery disease.

Method

A quantitative methodology using a service evaluation design frame was used. Retrospective descriptive analysis was used to analyse the data.

Results

Results showed that 55.95% of patients were seen in less than fourteen days from time of referral. Fifty-four point six five per cent of patients were classified as having cardiac pain at the end of the initial clinical review. Seventy-six point four seven per cent of exercise stress tests and 92.75% of echocardiograms were performed on the day. Thirteen point seven nine per cent of patients were referred directly for a coronary angiogram having a positive predictive value of 75%.

Conclusion

The RACPC in Malta is effective in identifying coronary artery disease as compared to clinics in the United Kingdom (UK). A more refined referral system is needed for patients to be more adequately triaged. More clinics and further resources are needed to keep within the recommended timeframe for patient review. Subsequent work may assess future outcomes of this patient cohort and further identify the unknown sources of referral to evaluate potential problems in the referral system.

Key Words

Chest pain, coronary artery disease, referral, Malta

INTRODUCTION

Background

The new Rapid Access Chest Pain Clinic (RACPC) in Malta was introduced in January 2021 at Mater Dei Hospital, Malta to help aid diagnosis and management of coronary artery disease (CAD) in the local population. The aim of the RACPC is to provide rapid assessment and treatment of patients with anginal chest pain who are referred from health centres/general practitioners, the emergency department and other in-patient facilities. Patients are seen by a cardiologist and are given a full cardiovascular assessment, appropriate diagnostic investigations, diagnosis and management plan.

Previous similar studies were conducted in the UK to evaluate National Health Service (NHS) funded RACPCs, assessing patient characteristics, the nature of the chest pain, diagnostics, final diagnoses and later outcomes. In areas where

RACPCs were introduced, a high positive predictive value of 74.4% was noted for CAD in patients who were referred for angiogram (Khan-Mahmood, Patel and Scoote, 2017) and lower risk patients were appropriately triaged and reassured (Taylor, et al., 2008).

Objective

The aim of this study is to assess the new RACPC's practices and outcomes and evaluate whether these meet the needs of the local population, compared to similar rapid access chest pain clinics in the UK.

METHOD

A quantitative methodology using a service evaluation design frame was used. Patients were evaluated using records from hospital intranet patient information servers, including CVIS (Cardiovascular Information System), iCM (iSOFT Clinical Manager) and CPAS (Clinical Patient Administration System). A convenience sample of ninety-five patients was taken spanning from January - April 2021. The sampled population were the first ninety-five patients who were referred to the clinic. A retrospective descriptive analysis was performed with the appropriate data protection approval obtained from the Mater Dei Hospital Data Protection Office. As research on human subjects was not involved, approval from a research ethics committee was not required for the purpose of the study.

RESULTS

A total of eighty-six patients attended the RACPC out of a total of ninety-five patients referred (90.52%). Forty-seven of these patients were seen less than fourteen days from documented referral (55.95%). Fifty-six of these patients were male (65%) and twenty-nine were female (34%). The source of referral ranged from Primary Health Care (29.07%), the Accident and Emergency Department (4.65%), Mater Dei Hospital (13.95%) and unknown (52.32%).

The patient characteristics and risk factors of the patients who were included in the study are listed in Table 1.

Table 1: Characteristics and risk factors of patients in study

Sex	Male	56 patients (65.9%)
	Female	29 patients (34.1%)
Age range		24 - 90 years (mean 60.7)
Risk factors	Previous myocardial infarction	7 patients (8.04%)
	Hypertension	50 patients (57.5%)
	Dyslipidaemia	27 patients (31%)
	Diabetes	20 patients (23%)
	Smoker	39 patients (44.8%)

Out of all the attendees, twenty-one (24.42%) had typical chest pain with sixty-five (75.58%) describing atypical chest pain. Patients were noted to have typical versus atypical chest pain according to the characteristics of the pain. The individual characteristics of the pain are noted in Table 2.

Table 2: Characteristics of the chest pain

		Number of Patients	Per cent of patients
Location of the chest pain	Central	54	62.1%
	Left	14	16.1%
	Right	4	4.6%
	No Chest Pain	15	17.2%
Nature of the pain	Compressive	40	46%
	Sharp	14	16.1%
	Burning	10	11.5%
	Other or no chest pain	21	24.4%
Duration	≤5 Minutes	46	52.8%
	5-15 Minutes	9	10.2%
	≥15minutes	12	13.8%
	Unspecified/no chest pain	20	23%
Frequency	Daily	43	48.4%
	Weekly	15	17.3%
	Monthly	4	4.6%
	One episode or no chest pain	25	28.7%

At the end of the clinic review, forty-seven (54.65%) of the patients referred were classified as having cardiac pain and thirty-nine (45.35%) with non-cardiac pain. Most investigations (100% of electrocardiograms, 92.75% of echocardiograms and 76.47% of exercise stress tests) were performed on the day, with others referred to another day. Further investigations included myocardial perfusion scans (MIBI scans) in 2.29%, computer tomography (CT) - coronary (12.64%) and Holter investigation (4.59%). Twelve of the patients were referred directly for a coronary angiogram (13.79%), with nine of these patients found to be positive for coronary artery disease (75%).

After the first visit to the RACPC, fifty-two patients (60.9%) were discharged to community follow up or to other cardiology specialist clinics. A three-month review noted that forty-two patients (48.84%) were discharged from the RACPC, thirty-four patients (39.5%) referred for a follow up appointment and ten patients (11.63%) referred to another specialised cardiology clinic with zero deaths or admissions.

DISCUSSION

Performance statistics when compared to similar clinics

Coronary artery disease (CAD) is the single most common cause of death in the developed world, responsible for about one in every five deaths. The morbidity, mortality, and socioeconomic importance of this disease make timely accurate diagnosis and cost-effective management of CAD of the utmost importance (Cassar et al., 2009). Rapid access chest pain clinics (RACPC) aim to provide quick and early specialist cardiology assessment for patients who present with new onset exertional chest pain or acute deterioration in patients with known ischaemic heart disease. The RACPC aims to provides rapid assessment and treatment of patients with suspected angina

within two weeks of referral as stated by the National Service Framework (NSF) for Coronary Heart Disease that states that 'patients with suspected cardiac chest pain (not requiring hospital admission) must be assessed by a specialist within two weeks' (Department of Health and Social Care, 2000).

From the data collected, 54.65% of the patients referred to the new RACPC in Mater Dei Hospital were classified as having cardiac pain, with 45.35% deemed to have non-cardiac pain. This differs from a nine-year review of similar clinics in the UK (between 2002 and 2011), where a larger amount of patients deemed to have non-cardiac pain were referred (22.5% cardiac chest pain versus 76.2% non-cardiac chest pain in 2010-11, with similar numbers noted in previous years) (Debney and Fox, 2012). A similar service evaluation study performed in the UK on a RACPC noted 51% of referred patients were diagnosed with non-cardiac chest pain (Morgan and Gaskin, 2015).

The collected data from the local RACPC showed that 13.79% of patients reviewed were referred for a coronary angiogram, with nine patients diagnosed as having coronary artery disease (75%). This result is very comparable to a similar UK study, which noted coronary artery disease in 74.4% of patients referred for angiogram (Khan-Mahmood, Patel and Scoote, 2017). This indicates that the clinic is at least as effective at identifying coronary artery disease as other clinics in the UK. On assessing three months outcomes, zero patients were admitted to hospital or deceased, with 48.84% of patients discharged on the first appointment as compared to 49.3% of patients discharged in a UK RACPC audit (Khan-Mahmood, Patel and Scoote, 2017), indicating a favourable short-term outcome for the patients.

Method of referral and impact on clinic

When assessing the sources of referrals from the data, these ranged from Primary Health Care (29.07%), the Accident and Emergency Department (4.65%), Mater Dei Hospital (13.95%), with 52.32% of patients with unknown sources of referral. A UK audit analysing outcomes from a UK RACPC noted 81.4% of referrals were from general practitioners (Khan-Mahmood, Patel and Scoote, 2017). This discrepancy is mainly thought to be secondary to a non-specific referral system, as well as the lack of patient registration noted in primary care practices in Malta as compared to the UK.

The data collected showed that forty-seven of these patients were seen in less than fourteen days from documented referral (55.95%). This differs from the National Service Framework target that aims for all referred patients to be seen within two weeks of referral. This may be due to a number of causes, postulated to mainly be in view of the limited number of clinics as well as the need for a more refined referral system for patients to be adequately triaged to ensure cases that satisfy the requirements for referral are seen within the stipulated timeframe. A dedicated ticket of referral system to the RACPC will help the former and the latter points, better identifying cases from other generic cardiac referrals and helping to identify the sources of referral; such an example is available in Figure 1. This system may be implemented in a paper format; however, a paperless, electronic format may be beneficial to review the patient in the required timeframe. Moreover, as the data noted that 17.4% of patients had no chest pain, a dedicated system may help to filter these cases and will help referral to the appropriate cardiac subspeciality.

RAPID ACCESS CHEST PAIN CLINIC REFERRAL FORM

Name	
Surname	
I.D.	
Age	
Address	
Mobile number	
Telephone number	
N.O.K Name	
N.O.K Relation	
N.O.K Contact number	

History of presenting complaint:

History: ☐ Highly ☐ Moderately ☐ Mildly suspicious for CAD

Risk Factors (circle as appropriate):

History of atherosclerotic disease (including MI, CVA/TIA, PAD)	Yes/No
Hypertension	Yes/No
Hyperlipidaemia	Yes/No
Diabetes	Yes/No
Smoker/past smoker	Yes/No
Family history of IHD (age <65)	Yes/No
Obesity	Yes/No
History of previous coronary intervention	Yes/No

ECG done	Yes/No
ECG findings	

Other PMH/PSH:

Drug History:

Past Cardiac History

- ☐ Is patient with known coronary artery chronic total occlusion (CTO)
- ☐ Is patient currently being investigated by a cardiologist or by the RACPC unless under category 1
- ☐ Has patient been investigated by a Cardiologist and had documented CAD for medical management in the past 12 months (unless under category 1
- ☐ Has patient been investigated for CAD by a Cardiologist in the past 5 years and had normal results (unless under category 1)
- ☐ History of/suspected valvular heart disease
- ☐ Known arrythmia, if so specify _____
- ☐ Symptoms of heart failure present
- ☐ Any documented/noted ECG changes

Examination findings:

☐ Tenderness at site of pain

☐ Presence of systolic heart murmur

☐ Blood pressure: _____

☐ Heart rate: _____

Troponin done: ☐ Yes ☐ No

Troponin level: ☐ < normal limit ☐ 2-3x normal limit ☐ >3x normal limit

Calculated *HEART score*[1] _____

Calculated *Framingham Risk Score for Hard Coronary Heart Disease*[2] (if ECG/Troponin unavailable) _____

Six, A., Cullen, L., Backus, B., Greenslade, J., Parsonage, W., & Aldous, S. et al. (2013). The HEART Score for the Assessment of Patients With Chest Pain in the Emergency Department. Critical Pathways In Cardiology: A Journal Of Evidence-Based Medicine, 12(3), 121-126. doi: 10.1097/hpc.0b013e31828b327e

D'Agostino RB et al.(I). General cardiovascular risk profile for use in primary care. The Framingham Heart Study. Circ 2008;117:743-53.

☐ Kindly attach a copy of a recent ECG below if available

☐ Kindly ensure the patient has the following blood tests from the past 3 months available on iCM

- Lipid profile
- Hba1c
- Liver profile
- Renal profile
- Complete blood count
- NT-proBNP

If not available, please ensure that these are taken as soon as possible, to be available for the appointment

Referral source	☐ Primary care	☐ A+E	☐ MDH
Referring physician name			
Registration number			
Signature			
Date			

Figure 1: Proposed refined referral system to the RACPC

Improvements to the RACPC and possible further research opportunities

As noted from the data, not all the baseline investigations were performed on the day, with 92.75% of echocardiograms and 76.47% of exercise stress tests being done on the day. This highlights the need for further resources to be allocated in order to open up further RACP clinics, with the capability for diagnostic investigations to be ideally performed on the day, in order to better delineate between cardiac and non-cardiac pain. Further economic, ecological and patient satisfaction studies should be performed to assess the viability and impact of such clinics in Malta. Although the data is encouraging, this cohort of patients should be followed up and outcomes should be assessed at twelve months to fully evaluate the service of the RACPC.

Strengths and limitations of the study

The main strength of this study is that it successfully delivers on its aim to show that the RACPC in Malta is as effective as in the UK and thus is an important aspect of outpatient care in the national health care service. These findings should, however, be interpreted with caution in view of the limitations of the study. These mainly include issues with data gathering, with restrictions within the current referral system, a limited period of observed patient follow-ups and a relatively small cohort of patients. The latter limitation lessened the power of the study and the ability to compare to other studies with a larger sample size.

CONCLUSION

This study has confirmed that the RACPC in Malta is an effective and efficient tool in identifying coronary artery disease as compared to similar clinics in the UK and is successful in highlighting patients with CAD requiring intervention. Still, there needs to be a more refined referral system for patients to be more adequately triaged. A draft revised referral form was created, based on the findings from this study and other studies referenced from clinics in the UK, including important data necessary for adequate triaging such as scores and previous investigation findings. The creation of more clinics would be beneficial to cater for the number of patients referred, in order to be able to keep to the recommended timeframe for patient review, with further resources allocated for more diagnostic investigations to be performed on the day as required. Economical, ecological and satisfaction studies could assess this. Subsequent evaluation may assess future outcomes of this patient cohort and further identify the unknown sources of referral, to evaluate potential problems in the referral system.

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