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RESEARCH ARTICLE

Blood investigation results at a primary health care centre in Malta – a brief evaluation

Dr Marilyn BALDACCHINO, Dr Rebecca CATANIA, Dr Jurgen ABELA and Dr Robert ELLUL

ABSTRACT

Background

This evaluation was based at Mosta Health Centre with a particular focus on the blood investigation results clinic.

Objectives

To get a clinical profile of the patients being seen at the clinic, to assess whether risk assessment tools are being used in the management of dyslipidaemia and to evaluate patient feedback about the clinic.

Method

This consisted of a cross-sectional observational study carried out over a five-week period between the end of October and the end of November 2017. Data was collected retrospectively immediately after completion of the clinic on three random days every week. Data collection was divided into two lists of patients – those who attended and those who failed to attend their appointment. A patient questionnaire was also handed to patients to fill in after attending their appointment. Data was inputted in Excel 2010 and analysed using Statistical Package for Social Sciences (SPSS) 22.

Results

A total of 181 patients had a registered appointment at the blood investigation results clinic during the period of data collection. Seventy-five per cent of these patients attended for their appointment, with 62.2% being females. Routine blood investigations were taken in 80.7% of patients, thyroid function tests in 71.9% and glycosylated haemoglobin in 31.9%. Fourteen point eight per cent of patients had tumour markers booked, and a significant association was found between gender and whether tumour markers were ordered. A risk assessment tool was used in only 21% of the patients seen at the clinic for a lipid profile result, with the majority of General Practitioners (GPs) using the QRISK®2 cardiovascular disease calculator. Seventy eight patient satisfaction questionnaires were filled in during the period of data collection, and the percentage of patients who gave a very positive response (>8) for questions 1, 2 and 3 was 92%, 89% and 97% respectively.

Conclusion

Patient attendance at the blood investigation results clinic at Mosta Health Centre during the period under review was reasonably good, and patients were overall satisfied by the service provided. Tumour markers were found to be ordered more frequently in male patients, due to the common request for the PSA test. Risk assessment tools were used by GPs in only 14% of the total number of patients seen at the clinic, and the QRISK®2 cardiovascular disease calculator was the most commonly used tool.

Keywords

Blood tests; dyslipidemias; patient satisfaction; primary health care; risk assessment

INTRODUCTION

Mosta Health Centre is one of the eight health centres which are the core of the primary health care service provided by the Government in Malta (Primary Health Care Department, 2017). One of the services offered on an almost daily basis is blood-letting, with patients being referred from their private General Practitioner (GP), the GP at the health centre, diabetic clinic in primary or secondary care, or several outpatient clinics at Mater Dei Hospital. Approximately 450 patients make use of the blood-letting service at Mosta Health Centre on a weekly basis (data from Clinical Patient Administration System (CPAS), January 2018). The

Blood Investigation Results clinic was re-introduced in October 2017 at Mosta Health Centre with the aim of providing follow-up to patients who do not have a private GP or outpatient follow-up appointment.

The clinic is run by General Practitioners on weekdays between 11am and 1pm. Ten minute appointment slots are available, and after blood-letting patients are instructed by nurses or receptionists whether they require an appointment to be given the results. During the appointment, results are reviewed and discussed with the patients. Any medication modifications or additions are made, and the necessary examination, prescriptions, referrals or follow-up investigations are organized as required by the individual patient.

Objectives

The objectives of this evaluation were:

1. To get a clinical profile (specifically the demographic factors, presence or absence of any medical conditions and type of investigations ordered) of the patients being seen at the Blood Investigation Results clinic;
2. To assess whether risk assessment tools are being used in the management of dyslipidaemia;
3. To evaluate patient feedback about the clinic (through a short questionnaire).

METHOD

Data collection

This consisted of a cross-sectional observational study. A data collection form was designed on Microsoft Excel to facilitate data collection. Data was collected over a five-week period between the end of October and the end of November 2017. Data was collected retrospectively immediately after completion of the clinic on three random days every week, and the list of patients, their record files and relevant investigations carried out through the Information Clinical Manager (ICM) system were reviewed. Such immediate collection of data allowed thoroughness of collection and minimised errors. Data collection was divided into two lists of patients – those who attended and those who failed to attend their appointment.

After due discussion amongst the authors and based on the aims of the study, it was decided that data collected should include:

- Age, gender and locality
- Presence or absence of any medical conditions
- Types of blood investigations ordered
- Any other investigations, including urine tests, bone density and ECG
- Values of total cholesterol, triglycerides, low-density lipoprotein (LDL) and high-density lipoprotein (HDL), fasting blood glucose (FBG), haemoglobin, glycosylated haemoglobin (HbA1c)
- Presence of a previously deranged lipid profile
- Whether a risk assessment tool was used in the assessment of dyslipidaemia and the risk level if this was used
- Whether the patient was already on a statin, or whether a statin was started on the day of the appointment

A patient questionnaire was also prepared, and this was handed to patients by the receptionist on arrival. Prior to distributing the questionnaire to the patients, the questions were reviewed by all four authors for validity and reliability. Patients were instructed to fill in the questionnaire after their appointment and deposit the completed questionnaire in a sealed box that was available at the reception. The questionnaire was available in Maltese and English and consisted of three questions, with a 0 to 10 rating scale as a response (See Appendix). Space was also provided for anyone who wished to add any comments or suggestions.

Data analysis

Data input and analysis was carried out using Microsoft Excel. Further analysis was conducted using Statistical Package for Social Sciences (SPSS) programme version 22.

Study approval

This evaluation was approved by the Department of Primary Health Care and by the Data Protection officer of the Department.

Standards

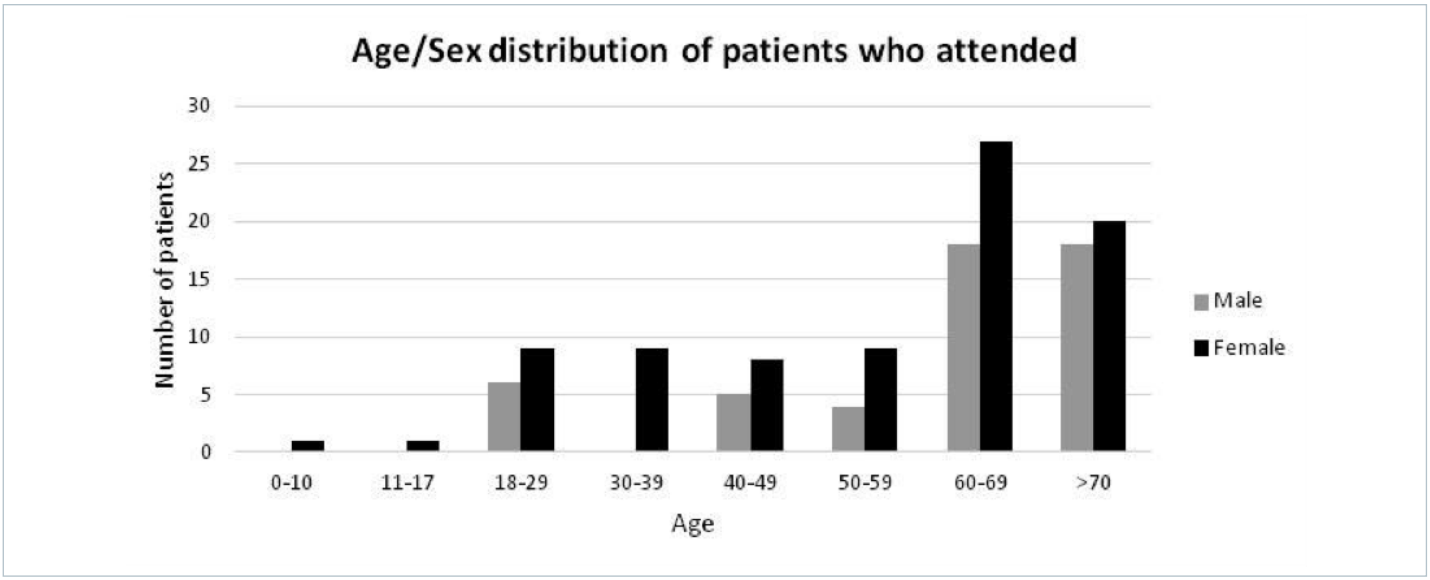
The NICE Guideline '*Lipid modification: cardiovascular risk assessment and the modification of blood lipids for the primary and secondary prevention of cardiovascular disease*' was used as a guide for the use of risk assessment tools, as well as the management of dyslipidaemia and recommended follow-up after starting treatment (National Institute for Health and Care Excellence, 2014).

RESULTS

Attendance at clinic

During the five weeks under review, 181 patients had a registered appointment at the Blood Investigation

Figure 1: Age/sex distribution of patients who attended their appointment



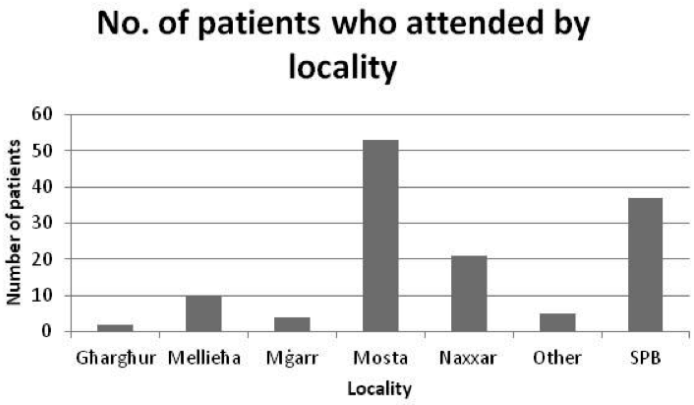
Results clinic during the particular days that data was being collected. Of these patients 61.9% were females and 38.1% were males. Forty-six patients (25%) failed to attend their appointment.

Demographic details

Sixty-two point two per cent (84) of the patients who attended their appointment were females and 37.8% (51) were males. The age/sex distribution of these patients is reproduced in Figure 1.

Forty per cent of the patients who attended their appointment resided in Mosta, with 28.1% coming from St Paul's Bay (SPB) and 16.3% from Naxxar. A summary of the number of patients who attended according to locality can be seen in Figure 2.

Figure 2: Distribution by locality of patients who attended their appointment



Of the 25% who failed to attend their appointment, 60.9% were females, and the most were aged 60-69 years. No significant association was found between defaulters and increasing distance of resident locality from the clinic, with the majority of patients residing in Mosta.

Medical conditions

The presence or absence of any medical condition in patients who had a registered appointment with the clinic was also recorded. These conditions include hypertension, asthma, ischaemic heart disease, chronic kidney disease, liver disease, diabetes and inflammatory bowel disease. This data was collected from the patient files in the case of patients who failed to attend their appointment, and from record files as well as information given by the patients themselves who attended the clinic appointment.

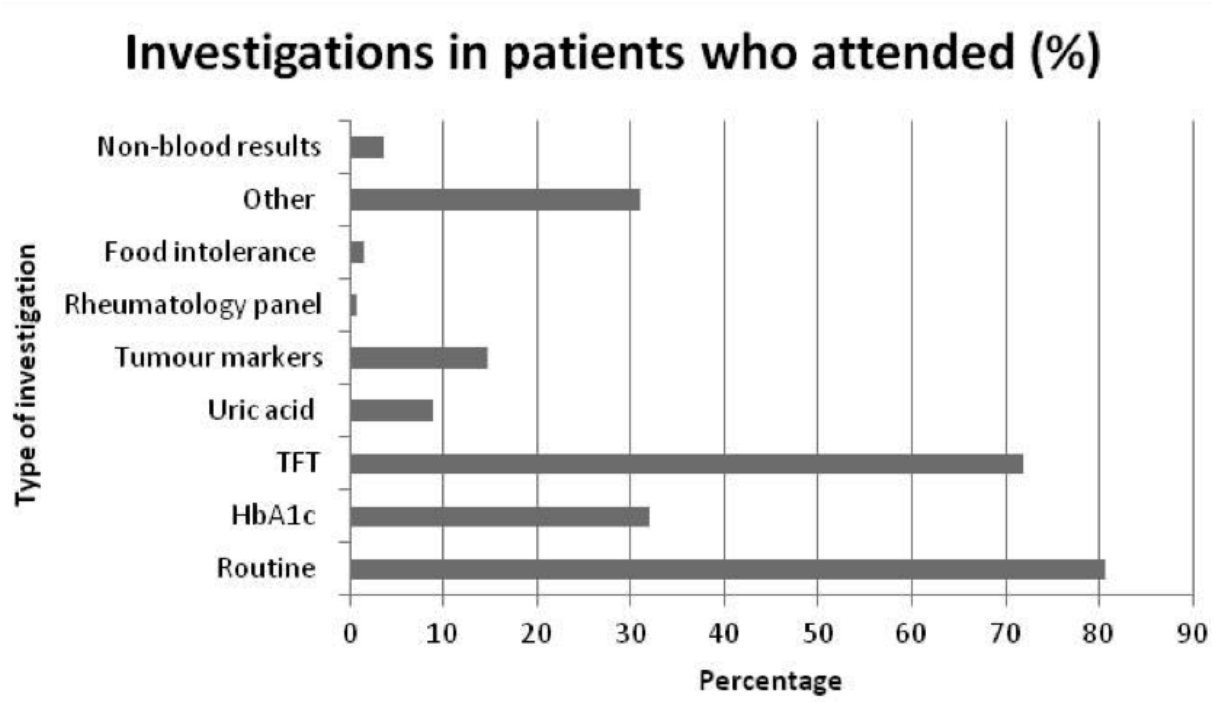
Sixty-one per cent of the patients who attended their appointment had a significant past medical history, while medical conditions were present in 48% of the patients who did not attend.

Investigations

Eighty point seven per cent of the patients who attended their appointment had 'routine blood investigations' taken (complete blood count, renal profile, lipid profile, liver profile and fasting blood glucose), 71.9% had thyroid function tests and 31.9% were tested for glycosylated haemoglobin (HbA1c).

Forty point seven per cent of the patients seen at the clinic had a previously deranged lipid profile (elevated total cholesterol).

Figure 3: Percentage of investigations ordered in patients who attended their appointment



Key: Non-blood results: Urinalysis, Urine MC&S, ECG, Bone density result; **Other:** Calcium, phosphate, protein, albumin, magnesium, ESR, CRP, NT-proBNP, LDH, SPE; **Food intolerance:** Coeliac screen, Milk-lactoglobulin; **Rheumatology panel:** Rheumatoid factor, ANA, anti-CCP; **Tumour markers:** PSA, CA-125, CEA, CA19.9; **TFT:** Thyroid function test; **HbA1c:** glycosylated haemoglobin; **Routine:** Complete blood count, Renal, lipid, liver profile, fasting blood glucose

Fourteen point eight per cent of patients had tumour markers booked (these included Prostate-Specific Antigen (PSA), cancer antigen 19-9 (Ca19.9), carcinoembryonic antigen (CEA) and cancer antigen 25 (CA-125)). A significant association ($p<0.05$) was found between sex and whether tumour markers were ordered, with males having tumour markers ordered more frequently.

Three point seven per cent of the patients who attended the clinic had no blood investigations booked, and presented for results of bone density, ECG or urine tests.

A summary of the percentage of all investigations taken in patients who attended the clinic is illustrated in Figure 3.

Table 1 shows the minimum and maximum values, and the mean with 95% confidence intervals, for a number of individual blood investigation parameters of the patients seen at the clinic, namely total cholesterol, HDL, LDL, total cholesterol:HDL ratio, fasting blood glucose, creatinine, haemoglobin and glycosylated haemoglobin.

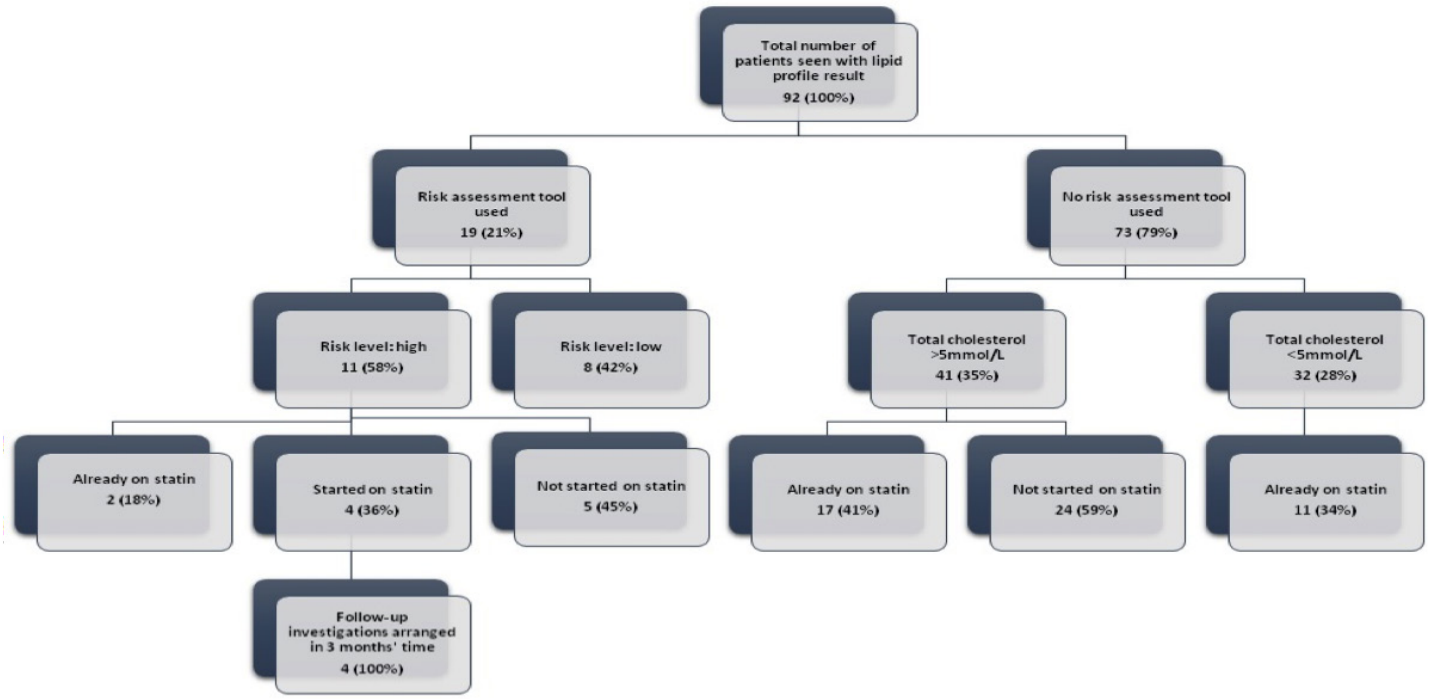
Forty-one point three per cent of the non-attenders had a previously deranged lipid profile (elevated total cholesterol), which was similar to that of patients who attended for their appointment.

Use of risk assessment tools and management of dyslipidaemia

A risk assessment tool was used in only 21% of the number of patients seen at the clinic who came for a lipid profile result. General Practitioners made use of the QRISK®2 cardiovascular disease calculator in 79% of these cases, with the remaining 21% having the Framingham risk score used.

Of the patients in which a risk assessment tool was used, 58% had a risk level classified as 'High'. Of these, 18% were already taking a statin, 36% were started on a statin and 45% were not started on a statin. All the patients who were started on a statin had repeat lipid profile and liver function tests booked as a follow-up in three months' time.

Figure 4: Summary of the use of risk assessment tools at the blood investigation



From the 86% of patients in whom a risk assessment tool was not used, 37% did not have a lipid profile included with their investigations and 28% had total cholesterol level less than 5mmol/L. Thirty-five per cent had a total cholesterol level more than 5mmol/L, and 41% of these were already on a statin.

A summary of the above results is illustrated in a flow chart in Figure 4.

Patient Satisfaction Questionnaire

Over the period of data collection, a total of 78 questionnaires were filled in, which is 57.8% of the total number of patients who attended. Two of the questionnaires were incompletely filled and excluded from the data analysis. Hence the total amount of questionnaires included in the analysis was 76. Question 1 which focused on the care received from the doctor was given a maximum score of 10 and a minimum score of 6 (mean value = 9.45 [95% CI: 9.23-9.67]). Question 2 dealt with the amount of time dedicated for the appointment and was given a maximum score of 10 and a minimum score of 4 (mean value = 9.21 [95% CI: 8.86-9.56]). Question 3 asked how likely it is that another appointment would be fixed with this clinic by the patient and was given a maximum score of 10 and a minimum score of 6 (mean value = 9.59 [95% CI: 9.40-9.79]).

The percentage of patients who gave a very positive response (>8) for questions 1, 2 and 3 was 92%, 89% and 97% respectively.

A few examples of the comments left by patients include the following:

- "The appointment is good so that we can ask the doctor any questions we need to know, and it saves time. Thank you."
- "It-tabib kien ġentili ħafna u anke tani kopja tar-riżultat biex inżommu. Grazzi ħafna u prosit. Keep it up." ["The doctor was very considerate and even gave me a copy of the results to keep. Many thanks and well done. Keep it up."]
- "I think the whole clinic has improved in its service - even though there has been an influx of patients using it. Thank you."

DISCUSSION

Over the five-week period under review, between the end of October and the end of November 2017, there was reasonably good attendance at the Blood Investigation Results clinic, with 75% of patients who had a registered appointment attending the clinic. Possible reasons for patient non-attendance include patients who have pending appointments at the Diabetic Clinic (Mosta Health Centre/ Mater Dei Hospital) or the Outpatient Department at Mater

Dei Hospital, patients who would have visited the GP clinic prior to their appointment and would have possibly been given the results during that visit, and patients having double appointments registered on the system.

Most of the patients attending the blood investigation results clinic were aged more than 60 years. The fact that the clinic takes place in the morning might make it difficult for people who work during office hours to attend at this time. A similar appointment system in the evening might be more attractive and practical for the younger working population.

Tumour markers were found to be ordered more frequently in male patients, with the likely reason being the frequent request for PSA in males. Tumour markers have a limited role in general practice, and the routine ordering of such investigations as a screening tool in asymptomatic patients is not recommended. Tumour markers have low sensitivity and specificity, and the inappropriate ordering of such tests can lead to false reassurance if the result is negative or a series of unnecessary investigations if the result is positive.

Possible reasons for the use of tumour markers in primary care may include requests by patients themselves to order these markers - possibly resulting from misinformation on the media, lack of patient education and fear of having cancer, as well as the fact that other investigations such as ultrasound scans cannot be ordered directly by general practitioners. Tumour markers have been mainly recommended in assessing response to treatment and detecting recurrence in known cases of malignancy (National Cancer Institute, 2018). Even in the case of PSA, which is used very commonly to screen males for prostate cancer, an increased level can be due to benign conditions and most males with a high PSA level do not have prostate cancer (National Cancer Institute, 2018). Patients should be given enough information to be able to make an informed decision about whether a PSA test should be taken or not (Leyva et al., 2016).

A risk assessment tool was used in only 21% of the patients seen at the clinic who came for a lipid profile result, with the majority having the QRISK®2 cardiovascular disease calculator used.

QRISK®2 is a prediction algorithm for cardiovascular disease (CVD) originally developed by Hippisley-Cox and published in the BMJ in 2008 (Hippisley Cox et al., 2008). It uses traditional risk factors (age, blood pressure, smoking status and ratio of total serum cholesterol to high-density lipoprotein cholesterol) together with body mass index, ethnicity, family history, chronic kidney disease, rheumatoid arthritis, atrial fibrillation, diabetes mellitus and antihypertensive treatment. The QRISK®2 cardiovascular disease calculator can easily be accessed from https://www.qrisk.org/.

The NICE lipid-modification guidelines recommend the use of the QRISK®2 cardiovascular risk assessment tool for primary prevention in people aged less than 84 years (including type 2 diabetics), as opposed to previous guidance offering a choice between QRISK®2 and Framingham-based assessment tools (National Institute for Health and Care Excellence, 2014). This guideline also recommends that the threshold for consideration of treatment with statins is a risk of CVD events of more than 10% over 10 years. Atorvastatin 20mg daily is recommended first-line, which is a change from simvastatin 40 mg daily recommended in previous guidelines. Locally, simvastatin still tends to be the initial choice, possibly due to Government of Malta Schedule V protocol 12 which states that patients are entitled

Table 1: Summary of results for individual blood investigation parameters

	Minimum	Maximum	Mean	95% Confidence Interval of the Difference	
				Lower	Upper
Total Cholesterol	3.02	7.50	5.24	4.98	5.39
HDL	0.74	2.88	1.61	1.50	1.69
LDL	1.30	4.88	3.01	2.81	3.14
Total: HDL ratio	1.28	9.00	3.47	3.19	3.68
FBG	4.33	11.37	5.75	5.50	6.00
Creatinine	41.00	148.00	75.66	70.61	79.19
Haemoglobin	11.30	18.20	14.33	14.06	14.60
HbA1c	4.70	8.80	5.89	5.63	6.16

to atorvastatin when despite the use of another statin (simvastatin/fluvastatin), the respective target LDL levels (as per protocol) have not been achieved (Department of Health Malta, 2012).

In this study, 45% of the patients with a high risk level were not started on a statin. Possible reasons for this include patient reluctance to start treatment, patients opting for a trial of dietary and exercise changes and repeat lipid profile, contraindications or previous side-effects with statins, or failure of the GP to offer statins as part of the management plan.

NICE Guidelines also recommend measuring total cholesterol and HDL-cholesterol after 3 months of treatment, with the aim of a 40% reduction in non-HDL cholesterol. All the patients started on a statin at the Blood Investigation Results clinic during this study had follow-up blood investigations booked. Creatine kinase (CK) should not be routinely measured in asymptomatic people on statins or before starting statins; it should only be taken prior to starting treatment in people who have had persistent generalised unexplained muscle pain (with or without lipid-lowering therapy), and statins should not be initiated if CK levels are more than 5 times the upper limit of normal, in 2 tests 7 days apart (National Institute for Health and Care Excellence, 2014).

The results of the Patient Satisfaction Questionnaires reflect an overall appreciation of the Blood Investigation Results clinic based on an appointment system. The vast majority of patients who were seen at the clinic were satisfied by the service provided, considered the amount of time dedicated to them satisfactory and are willing to continue using the service in the future. This is supported by positive comments left by several patients who consider this system as convenient and time saving. A factor frequently pointed out in the comments section was the importance of short waiting times.

Strengths and limitations

Over the five-week period under review, data of 72% of the total registered patient appointments during that period was recorded. Therefore, the sample of data is very much reflective of the activity at the Blood Investigation Results clinic over this period of time.

A possible limitation of this study is that there were a few occasions when one of the authors was assigned to the blood investigation results clinic on the day of data collection, and this may have been a source of bias with regards to the use of the risk assessment tools in the management of dyslipidaemia.

The specific medical conditions for each patient were not recorded in this study, and only the presence or absence of these was recorded. This was therefore a limiting factor particularly in evaluating the clinical profile of the patients that were being seen at the clinic.

Another limitation of the study was that patient satisfaction questionnaires were not always distributed to patients by the receptionist, as well as patient illiteracy making them unable to complete the questionnaire.

RECOMMENDATIONS

The NICE Guideline 'Lipid modification: cardiovascular risk assessment and the modification of blood lipids for the primary and secondary prevention of cardiovascular disease' or a summary of this guideline should be forwarded to GPs by email, particularly highlighting the section regarding use of the risk assessment tools, initiation of statins and recommended follow-up thereafter. This would serve as a reminder about the usefulness of using this tool in everyday practice and the resulting improved patient care. A small poster about the use of the QRISK®2 cardiovascular disease calculator in the all the GP rooms will serve as a reminder for all doctors. A refresher lecture for GPs and GP trainees focusing on this topic would also be useful. Developing a local protocol for the management of dyslipidaemia in primary care would help to provide evidence-based guidance to GPs and result in more standardized patient management. A re-evaluation of the use of risk assessment tools in the management of dyslipidaemia can be undertaken after these guidelines have been distributed.

Guidelines should be issued for reception staff and doctors/nurses at Mosta Health Centre stating the purpose of the Blood Investigation Results clinic and when an appointment should be arranged. Automatically registering patients for a results appointment after having blood tests taken should be avoided and the purpose of the appointment should be explained to patients. Advising patients to cancel appointments in advance if they cannot make it should be encouraged, as this affects the waiting list for appointments at the blood investigation results clinic.

Further evaluation of the clinic, including the source of referral for blood investigations, the reason/s for ordering the blood tests (with a particular focus on certain investigations, such as tumour markers) and the length of time the patients have to wait between taking blood tests and getting an appointment for the results, should be considered.

Based on the good patient feedback received, consideration should also be given to arranging appointments for results of investigations other than blood tests, like for example bone mineral density results.

CONCLUSION

Patient attendance at the blood investigation results clinic at Mosta Health Centre during the period under review was reasonably good, and patients were overall satisfied by the service provided. Tumour markers were found to be ordered more frequently in male patients, due to the common request for the PSA test. Risk assessment tools were used by GPs in only 21% of the patients seen at the clinic for a lipid profile result, and the QRISK®2 cardiovascular disease calculator was the most commonly used tool. A refresher lecture about or distribution of the NICE Guideline '*Lipid modification: cardiovascular risk assessment and the modification of blood lipids for the primary and secondary prevention of cardiovascular disease*' to GPs would be useful as a reminder about the benefit of using this tool in everyday clinical practice.

Appendix

Blood investigation results clinic Patient Questionnaire

1. Overall how would you rate the care you received from the doctor at the blood investigation results clinic?

0 1 2 3 4 5 6 7 8 9 10

Poor — Excellent

2. How satisfied/dissatisfied were you with the amount of time the doctor spent with you during your appointment?

0 1 2 3 4 5 6 7 8 9 10

Very dissatisfied — Very satisfied

3. How likely is it that you would make another appointment with the blood investigation results clinic at Mosta HC?

0 1 2 3 4 5 6 7 8 9 10

Not at all likely — Extremely likely

4. Any comments/suggestions?

_____

_____

_____

Thank you for taking the time to fill in this questionnaire.

Kwestjonarju għal-pazjenti li jattendu l-klinika tar-riżultati tad-demm

1. Kif thoss li kienet il-kura li inghatajt mit-tabib fil-klinika tar-riżultati?

0 1 2 3 4 5 6 7 8 9 10

Fqira — Eċċellenti

2. Kemm kont sodisfatt/a bl-ammont ta' ħin li kellek għall-appuntament fil-klinika tar-riżultati?

0 1 2 3 4 5 6 7 8 9 10

Lanqas xejn — Tajjeb ħafna

3. Taħseb li terġa tagħmel appuntament ieħor mal-klinika tar-riżultati tad-demm?

0 1 2 3 4 5 6 7 8 9 10

Żgur li le — Probabbilta kbira

4. Kummenti/suġġerimenti?

_____

_____

_____

Grazzi talli ħadt il-ħin biex timla dan il-kwestjonarju.

ACKNOWLEDGMENT

The reception staff at Mosta Health Centre for their help in distributing and collecting the patient satisfaction questionnaires.

Dr Marilyn BALDACCHINO
MD, MMCFD, MRCGP (INT.)
Mosta Health Centre, Primary Health Care Department, Malta
E-mail: marbaldacchino@gmail.com

Dr Rebecca CATANIA
MD
Mater Dei Hospital, Malta

Dr Jurgen ABELA
MD, DCH (Lond.), MSc (Warw.), FMCFD, FLCM, FRCGP(UK)
Mosta Health Centre, Primary Health Care Department, Malta

Dr Robert ELLUL
MD, PG Cert Diabetes (Wales), MMCFD
Mosta Health Centre, Primary Health Care Department, Malta

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