

Cardiovascular risk assessment and management in rheumatoid arthritis: are guidelines being followed?

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Abstract

Aim: The aim of the audit was to determine whether the cardiovascular risk assessment and management in rheumatoid arthritis patients at Mater Dei Hospital is in concordance with the recommendations by the European League Against Rheumatism (EULAR).

Background: Patients who suffer from rheumatoid arthritis have an increased risk of morbidity and mortality from cardiovascular disease. This is due to both the high prevalence of traditional risk factors, and systemic inflammation.

Method: This audit was carried out retrospectively on 91 patients by using the medical notes to collect data on demographics, co-morbidities, drug history and cardiovascular risk assessment and management over a two year period (August 2010 to July 2012). The data was then analysed in order to assess whether the management of cardiovascular risk in rheumatoid arthritis patients was in concordance with EULAR recommendations.

Results: Cardiovascular risk factors were documented as follows over the two year period audited: weight in 27.5%, BMI in 0%, smoking status in 72.5%, blood pressure in 72.5%, blood glucose in 72.5% and lipid profile in 54.9%. Smoking cessation advice was given in 15.8% and advice on other lifestyle changes in 14.3%. 81.1% of hypertensive patients were on treatment recommended as first-line by the guidelines and HbA1c was adequately controlled in 85.7% of diabetic patients in whom it was monitored.

Conclusion: Cardiovascular risk factors are highly prevalent in rheumatoid arthritis patients. This audit identified aspects of cardiovascular risk assessment that require improvement. This would enable a better identification of cardiovascular risk factors that could be treated in order to reduce the patients' cardiovascular morbidity and mortality.

Keywords: rheumatoid arthritis, risk factors, medical audit

Aims and Objectives

The aim of the audit was to determine whether cardiovascular risk assessment and management is being carried out in rheumatoid arthritis patients at Mater Dei Hospital in concordance with the "EULAR evidence-based recommendations for cardiovascular risk management in patients with rheumatoid arthritis and other forms of inflammatory arthritis" published in 2010.¹ A further aim was to identify whether the rheumatoid arthritis disease activity is adequately controlled.

Moreover, the prevalence of the traditional risk factors (including diabetes, hypertension, hyperlipidaemia and smoking) in our cohort of Maltese rheumatoid arthritis patients was determined.

Background

Rheumatoid arthritis is a chronic systemic inflammatory disease that typically presents with a symmetrical polyarthritis with occasional extra-articular involvement of other systems including the skin, heart, lungs and eyes. The aetiology is unknown and the prevalence is approximately 1%. Women are affected approximately three times more often than men.

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Patients with rheumatoid arthritis have multiple co-morbidities of which cardiovascular disease is the most important. Studies have shown that rheumatoid arthritis patients have a markedly increased risk of death compared with the general population.² This is largely due to the increased risk of ischaemic heart disease and cardiovascular death.³⁻⁵ Solomon *et al* observed an approximate doubling of the rate of myocardial infarction and stroke in patients with rheumatoid arthritis and the rate of cardiovascular death was increased by 30%.⁶ Moreover, a meta-analysis of fourteen controlled observational studies showed that the risk of incident cardiovascular disease is increased by 48% in patients with rheumatoid arthritis compared to the general population.⁷ A cross-sectional study, the CARRE investigation, showed that the prevalence of cardiovascular disease in rheumatoid arthritis is increased to an extent that is at least comparable to that of type 2 diabetes.⁸

A cross-sectional study on 400 rheumatoid arthritis patients showed that hypertension is highly prevalent (70%) in rheumatoid arthritis patients. In this study, it was noted that hypertension is under-diagnosed especially in young patients, and under-treated in older patients who have multiple co-morbidities.⁹ Moreover, an adverse lipid profile (lower high density lipoprotein cholesterol (C-HDL), apolipoprotein A1 and B and higher total cholesterol (CT) to C-HDL ratio and low density lipoprotein cholesterol (C-LDL) to C-HDL ratio) has been noted in rheumatoid arthritis patients when compared to the general population.¹⁰

The excess cardiovascular burden cannot be fully explained by traditional cardiovascular risk factors alone. Systemic inflammation in rheumatoid arthritis contributes to the risk of cardiovascular events.¹¹⁻¹⁴ Current evidence shows that both the traditional risk factors and markers of rheumatoid arthritis severity contribute to cardiovascular risk.¹⁵⁻¹⁷ Thus screening and management of traditional cardiovascular risk factors as well as adequate control of inflammatory arthritis are necessary to prevent cardiovascular events in rheumatoid arthritis patients.¹⁸

The EULAR guidelines make the following main recommendations, which we have used as gold standards for the audit:

1. An annual cardiovascular risk assessment including measurement of blood pressure and random lipids is advised in rheumatoid arthritis patients. The SCORE model should then be used to determine the degree of cardiovascular risk. (Figure 1) This is an easy-to-use chart that helps calculate the ten year risk of fatal cardiovascular disease by taking into account traditional risk factors including age, gender, smoking, systolic blood pressure and

cholesterol level.¹⁹ The EULAR guidelines recommend the use of the total cholesterol/HDL ratio when the SCORE model is used. Moreover, the risk should be multiplied by 1.5 if the patient has 2 of the following 3 criteria: a) disease duration of more than ten years, b) positive rheumatoid factor (RF) or anti-citrullinated protein antibodies (ACPA), c) presence of severe extra-articular manifestations. In patients with low cardiovascular risk and inactive disease, a lower frequency of assessment such as every 2-3 years could be adopted.

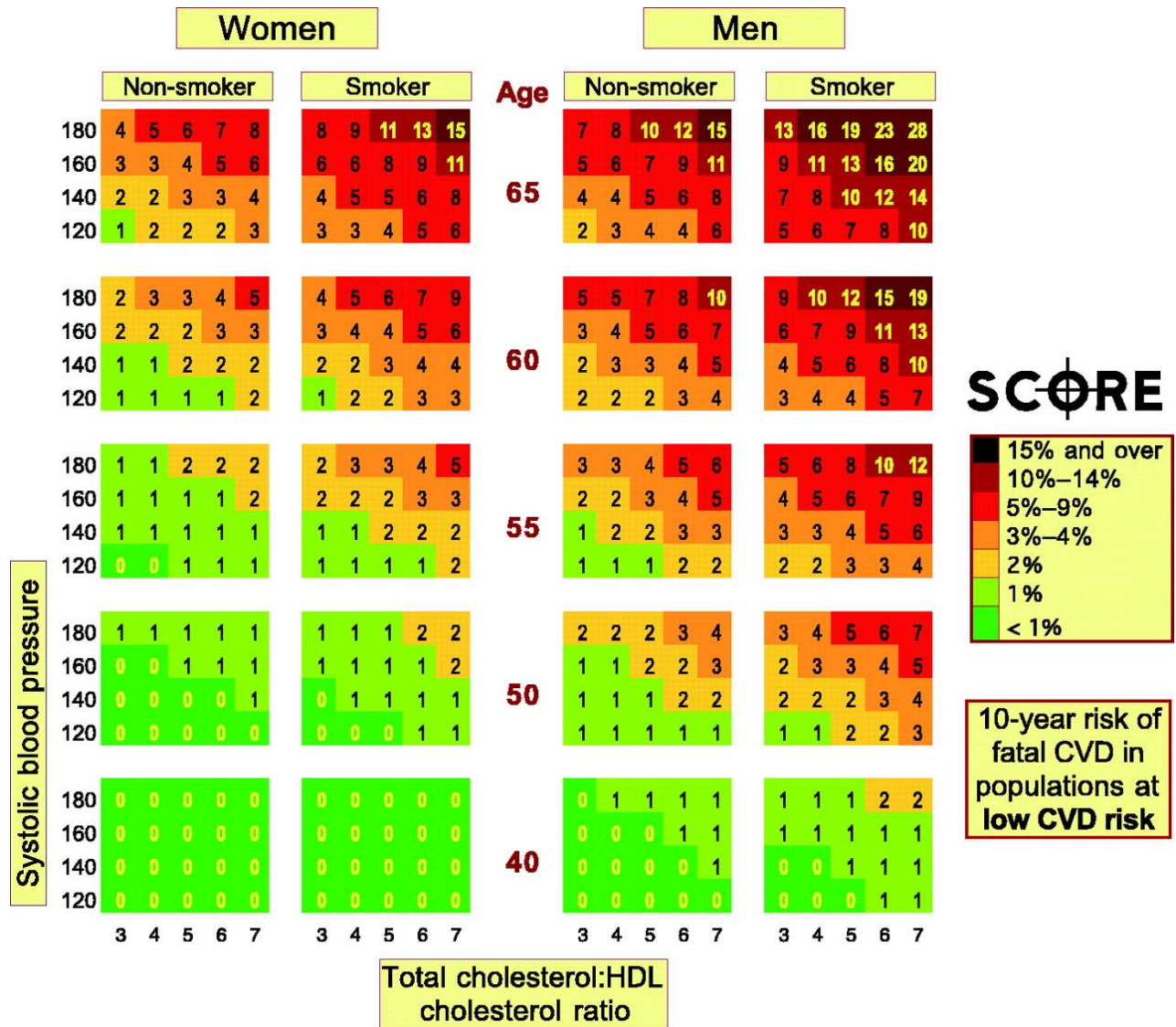
2. Intervention should be carried out using local guidelines or if unavailable using the SCORE model. Cardioprotective treatment should be initiated when the estimated 10-year cardiovascular risk is above the risk threshold for each country. Since there are no local guidelines on the subject, the SCORE model and the “European guidelines on cardiovascular disease prevention in clinical practice” published in 2012 have been used for our purpose. These recommend that cholesterol-lowering therapy should be started if cardiovascular risk is >5 to <10% and LDL is ≥ 2.5 mmol/L or if cardiovascular risk is $\geq 10\%$ and LDL is ≥ 1.8 mmol/L.²⁰
3. Statins, angiotensin converting enzyme (ACE) inhibitors and angiotensin II receptor blockers (ARBs) are preferred treatment options when indicated.
4. Disease activity should be controlled adequately to further lower the cardiovascular risk.
5. Smoking cessation should be recommended.
6. Lifestyle modification advice should be given to all patients.

Since there is no mention on the ideal targets for the control of diabetes by the EULAR guidelines, the recommendations by the “European guidelines on cardiovascular disease prevention in clinical practice” have been used as a gold standard in the audit.²⁰ These recommend that the target HbA1c for the prevention of cardiovascular disease in diabetes is <7%.

Method

91 consecutive patients with definite rheumatoid arthritis according to the 2010 ACR/EULAR Rheumatoid Arthritis classification criteria were recruited from the database of patients under the care of a medical consultant.²¹ For every patient a proforma was completed using the medical notes, as well as the I-soft programme to collect the results of the blood investigations.

Figure 1: The SCORE model used to calculate the ten year risk of fatal cardiovascular disease.¹⁹



The data collected included basic information such as demographic data, past medical history of ischaemic heart disease and its traditional risk factors, drug history and smoking history. Data on cardiovascular risk assessment (including measurement of blood pressure, lipid profile, blood glucose) over a one year period (from August 2011 to July 2012) was also collected. If such data was absent since it was not measured or not documented, data from the previous one year period (August 2010 to July 2011) was collected if available. In those cases where data on age, gender, smoking, blood pressure and lipid profile was complete, the 10 year risk of fatal cardiovascular disease was calculated by using the SCORE chart. The total cholesterol/HDL ratio was used as a measure of cholesterol in the SCORE chart as advised by the EULAR guidelines. Moreover the risk was multiplied by 1.5 if the patient had 2 of the 3 criteria: a) disease duration of more than ten years, b) positive RF or ACPA, c) presence of severe extra-articular manifestations. The data was then analysed in

order to determine whether cardiovascular risk management was being carried out as recommended by the guidelines. Thus it was determined whether hypertensive patients were being treated with ACE inhibitors or ARBs when indicated; whether hyperlipidaemic patients were being treated with statins when recommended; whether smoking cessation and lifestyle advice was being given and documented; whether DAS28, ESR and CRP were being measured and if disease activity was adequately controlled.

Approval to carry out this audit was obtained by the data protection department at Mater Dei Hospital and by the University Research Ethics committee.

Results

Of the 91 patients audited 59 (64.8%) were female and 32 (35.2%) were male. The mean age was 62.7 years. The duration of rheumatoid arthritis was documented in 79 patients (86.8%). The mean duration was 7.6 years. Rheumatoid factor result was documented

in 82 patients (90.1%), of which 62 patients (75.6%) were rheumatoid factor positive. ACPA result was documented in 48 patients (52.7%), of which 29 patients (60.4%) were ACPA positive.

The patients' weight was documented in 25 patients (27.5%). The height and BMI was not documented in any of the patients audited. The patients' smoking status was documented in 66 patients (72.5%). Of these 19 were smokers, 11 were ex-smokers and 36 were lifelong non-smokers. Out of the 19 current smokers, smoking cessation advice was given and documented in 3 patients (15.8%). In all the patients audited, lifestyle changes advice (including diet, exercise and weight loss) was given and documented in 13 patients (14.3%).

The blood pressure was checked and documented at least once in the one year audited in 49 patients (53.8%). It was checked in the two year period in 66 patients (72.5%). Out of the patients audited, 37 suffered from hypertension. Of these, 23 patients were on an ACE inhibitor and 7 were on an angiotensin receptor blocker (ARB). Overall 81.1% of hypertensive patients were on an ACE inhibitor or ARB.

Random or fasting blood glucose was measured in the previous year in 52 patients (57.1%). It was checked in the previous two years in 66 patients (72.5%). Out of the patients audited, 15 were diabetic. Of these HbA1c was checked in 7 patients (46.7%) over the two year period audited. This was 7% or more in only one patient.

Out of the patients audited, 12 were known to suffer from hyperlipidaemia. Lipid profile was monitored in 35 patients (38.5%) in the previous year and in 50 patients (54.9%) in the previous two years. The ten year cardiovascular risk could be calculated in 29 patients (31.9%) since these had complete data with regards to age, sex, smoking history, blood pressure and lipid profile. Eight of these patients were on a statin. When taking into account the cardiovascular risk and the last lipid profile, statins were indicated according to the guidelines in 5 out of these 29 patients; only one of these 5 patients was on a statin. Statins were most likely also indicated in the remaining 7 patients on statins, since the lipid profile used to calculate the ten year cardiovascular risk was one taken over the last two years when the patient was already receiving a statin.

An ESR was checked in the previous year in 87 patients (95.6%) and it was checked in the previous 2 years in all patients. The CRP was checked in the previous year in 84 patients (92.3%) and it was checked in the previous two years in 89 patients (97.8%). DAS 28 was calculated in the previous year in 19 patients (20.9%) and in the previous two years in 39 patients (42.9%). Out of these 39 patients, a high disease activity was noted in 5 patients; a moderate disease activity in 18 patients; a low disease activity in 7 patients; and 9 patients were in remission.

Conclusions

The prevalence of diagnosed hypertension in our cohort of rheumatoid arthritis patients was 40.7%; diabetes was 16.5%; hyperlipidaemia was 13.2%; and ischaemic heart disease was 6.6%. The prevalence of hypertension in the Maltese general population over 15 years of age has been estimated to be 22%; while that of diabetes is 8%.²² This shows that the traditional risk factors for cardiovascular disease are highly prevalent and their monitoring and treatment is essential in order to decrease the mortality of rheumatoid arthritis patients.

An improvement in the measurement of weight and height, and the calculation of BMI would be useful since it would prompt advice on weight loss, diet and exercise. Moreover the documentation of smoking status would encourage giving smoking cessation advice to smokers.

The measurement of the traditional risk factors requires improvement. Blood pressure was measured in 53.8%, blood glucose in 57.1% and lipid profile in 38.5% over a one year period. This improved to 72.5%, 72.5% and 54.9% respectively when a two year period was considered. Of note, blood pressure measurements taken by general practitioners that were not documented in the hospital notes were not accounted for in this audit. A good proportion (81.1%) of hypertensive patients were being treated with ACE inhibitors or ARBs as recommended. Monitoring of diabetic patients by measurement of HbA1c requires improvement since it was checked in 46.7% of diabetic patients. Control of diabetes in patients in whom HbA1c was checked was adequate.

An improvement in the monitoring of the risk factors for cardiovascular disease would enable the calculation of the 10 year risk of fatal cardiovascular disease by using the SCORE chart in a larger proportion of patients. Hence this would enable the treatment of hyperlipidaemia when indicated. In fact, out of the 29 patients in whom the cardiovascular risk could be calculated by using the SCORE chart, four patients who would benefit from treatment with a statin (and were not on any lipid lowering drugs) were identified.

Monitoring of disease activity by measurement of ESR and CRP was adequate. However, the calculation of DAS28 was lacking (20.9% in a one year period; 42.9% in the two year period). This finding is in concordance with the findings of another audit where only 50% of patients starting treatment with a biologic agent had a DAS 28 score documented in the year prior to starting this treatment.²³ This requires improvement since the calculation of DAS28 enables a better identification of patients with a high disease activity that in itself increases the risk for cardiovascular disease. Our results show that in those patients in whom DAS28 was calculated, 41% were in remission or had a low disease activity.

Table 1: Summary of the percentage of patients in whom risk factors and disease activity measurements have been measured over the period audited.

<i>Risk factor / Disease activity measurement</i>	<i>Percentage of patients in whom risk factor is documented (over a one year period, if applicable)</i>	<i>Percentage of patients in whom risk factor is documented over a two year period (if applicable)</i>
Weight	27.5%	
BMI	0%	
Smoking status	72.5%	
Blood pressure	53.8%	72.5%
Blood glucose	57.1%	72.5%
Lipid profile	38.5%	54.9%
ESR	95.6%	100%
CRP	92.3%	97.8%
DAS 28	20.9%	42.9%

The audit shows that ACPA was not measured or documented in 47.3% of rheumatoid arthritis patients. This requires improvement, especially in view of its prognostic significance.²⁴

Thus from our audit we can conclude that the management of cardiovascular risk factors is reasonable when these have been identified. However, a better cardiovascular risk assessment of the rheumatoid arthritis patients would enable the identification of risk factors that could then be treated to help decrease the patients' morbidity and mortality from cardiovascular disease. This could be done by introducing a proforma (including cardiovascular risk factors and the calculation of the 10 year risk of fatal cardiovascular disease), that would be filled in on a yearly basis during the patients' visit at outpatients. This would serve to remind the clinician of the current recommendations and ensure that the cardiovascular risk factors are monitored and documented.

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