CLINICAL AUDIT

Monitoring before treatment **with ACE inhibitors**

Valid to July 2021

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Audit focus

This audit focuses on baseline monitoring of patients before starting treatment with an ACE inhibitor. For the purposes of this audit, baseline is defined as three months before starting treatment. Baseline monitoring for angiotensin II receptor blockers is not covered in this audit although the general principles are the same as for ACE inhibitors.

Background

ACE inhibitors are commonly used and are indicated for a range of conditions including heart failure, hypertension, post myocardial infarction and diabetic nephropathy.

The pharmacological actions of ACE inhibitors include reduced glomerular filtration, raised serum potassium and reduced blood pressure. In most patients these effects are an indicator of a beneficial effect and are not associated with adverse events. However, ACE inhibitors can cause clinically significant hyperkalaemia, renal impairment or hypotension in patients with pre-existing risk factors such as volume depletion, concurrent diuretics, renal impairment, heart failure, diabetes and concurrent use of medicines with the potential to interact (e.g. NSAIDs). Baseline monitoring helps identify patients at risk of adverse effects before starting an ACE inhibitor. ACE inhibitors are most likely to cause hypotension after the first dose or after a dose increase.

Ongoing monitoring is also recommended during treatment to check for clinically significant changes in serum potassium and renal function from baseline but is not covered in this audit.

Cautions prior to use of ACE inhibitors

ACE inhibitors should be used with caution in a range of situations due to the increased risk of adverse effects or interactions with a patient's existing medicines. Precautions include the following:

- Renal impairment and contraindicated in patients with bilateral renal artery stenosis
- Hyponatraemia, hypovolaemia and dehydration
- Concomitant high dose diuretics due to the risk of hypotension
- Peripheral vascular disease and renovascular disease
- Hyperkalaemia
- Hypotension
- Severe heart failure
- Concomitant use of NSAIDs due to the risk of renal impairment, potassium sparing agents due to the risk of hyperkalaemia. There is also potential for other medicine interactions including lithium.

Justification for baseline monitoring

Hospital admissions due to renal impairment, hyperkalaemia and hypotension are common in patients taking ACE inhibitors. Baseline monitoring of renal function, electrolytes and blood pressure would be expected to prevent some of these events although there is a lack of supporting evidence from clinical studies.[1] Most national and international practice guidelines recommend baseline monitoring of patients but compliance is variable, ranging from about 20 – 80 %.[2, 3]

Baseline values of electrolytes, creatinine and blood pressure also set a benchmark for ongoing monitoring of treatment effectiveness and safety.

Recommendations

For patients taking an ACE inhibitor there should be documented evidence of measurement of creatinine, electrolytes and blood pressure within the three months prior to starting treatment.*

* Three months is an arbitrary period suggested to capture most clinical situations. For example, for most patients it will be appropriate to measure blood pressure immediately before starting treatment whereas a less recent electrolyte or creatinine measurement may be appropriate, unless the patient is clinically unstable or at increased risk of an adverse effect.

References

1. McDowell SE, Ferner RE. Biochemical monitoring of patients treated with antihypertensive therapy for adverse drug reactions: a systematic review. Drug Saf 2011;34:1049–59. doi:10.2165/11593980-000000000-00000
2. Coleman JJ, McDowell SE, Evans SJW, et al. Oversight: a retrospective study of biochemical monitoring in patients beginning antihypertensive drug treatment in primary care. Br J Clin Pharmacol 2010;70:109–17. doi:10.1111/j.1365-2125.2010.03654.x
3. McDowell SE, Thomas SK, Coleman JJ, et al. A practical guide to monitoring for adverse drug reactions during antihypertensive drug therapy. J R Soc Med 2013;106:87–95. doi:10.1258/jrsm.2012.120137

Audit plan

Summary

This audit focuses on the measurement of serum creatinine (to estimate glomerular filtration), electrolytes and blood pressure prior to starting a patient on an ACE inhibitor.

Recommended audit standards

For the purposes of this audit, 80% of patients taking an ACE inhibitor should have documented values of serum creatinine and electrolytes and 100% for blood pressure within the three months prior to starting treatment.

Data

Eligible people

Any patient that has received a prescription for an ACE inhibitor in the last 12 months is eligible for this audit.

Identifying patients

You will need to have a system in place that allows you to identify eligible patients who have been prescribed an ACE inhibitor and audit their clinical notes. Many practices will be able to identify patients by running a "query" through their PMS system.

Sample size

The number of eligible patients will vary according to your practice demographic. If you identify a large number of patients, take a random sample of 30 patients whose notes you will audit.

Criteria for a positive result

A positive audit result is for 80% of patients to have documented baseline serum creatinine (eGFR) and electrolytes, and 100% of patients have a documented baseline blood pressure.

Identifying opportunities for Audit of Medical Practice

The first step to improving medical practice is to identify the criteria where gaps exist between expected and actual performance and then to decide how to change practice.

Once a set of priorities for change have been decided on, an action plan should be developed to implement any changes.

Taking action

It may be useful to consider the following points when developing a plan for action (RNZCGP 2002).

Problem solving process

- What is the problem or underlying problem(s)?
- Change it to an aim
- What are the solutions or options?
- What are the barriers?
- How can you overcome them?

Overcoming barriers to promote change

- Identifying barriers can provide a basis for change
- What is achievable – find out what the external pressures on the practice are and discuss ways of dealing with them in the practice setting
- Identify the barriers
- Develop a priority list
- Choose one or two achievable goals

Effective interventions

- No single strategy or intervention is more effective than another, and sometimes a variety of methods are needed to bring about lasting change
- Interventions should be directed at existing barriers or problems, knowledge, skills and attitudes, as well as performance and behaviour

Review

Monitoring change and progress

It is important to review the action plan developed previously at regular intervals. It may be helpful to review the following questions:

- Is the process working?
- Are the goals for improvement being achieved?
- Are the goals still appropriate?
- Do you need to develop new tools to achieve the goals you have set?

Following the completion of the first cycle, it is recommended that the doctor completes the first part of the Audit of Medical Practice summary sheet (Appendix 1).

Undertaking a second cycle

In addition to regular reviews of progress with the practice team, a second audit cycle should be completed in order to quantify progress on closing the gaps in performance.

It is recommended that the second cycle be completed within 12 months of completing the first cycle. The second cycle should begin at the data collection stage. Following the completion of the second cycle it is recommended that practices complete the remainder of the Audit of Medical Practice summary sheet.

The Royal New Zealand College of General Practitioners

Claiming MOPS credits

This audit has been endorsed by the RNZCGP as an Audit of Medical Practice activity (previously known as Continuous Quality Improvement – CQI) for allocation of MOPS credits; 10 credits for a first cycle and 10 credits for a second cycle. General practitioners taking part in this audit can claim credits in accordance with the current MOPS programme.

To claim points go to the RNZCGP website: **www.rnzcgp.org.nz**

Record your completion of the audit on the MOPS Online credit summary, under the Audit of Medical Practice section. From the drop down menu, select the audit from the list or select "Approved practice/PHO audit" and record the audit name in "Notes", the audit date and 10 credits.

General practitioners are encouraged to discuss the outcomes of the audit with their peer group or practice.

As the RNZCGP frequently audit claims you should retain the following documentation, in order to provide adequate evidence of participation in this audit:

1. A summary of the data collected
2. An Audit of Medical Practice (CQI) Activity summary sheet (included as Appendix 1).

The Royal New Zealand College of General Practitioners
Te Whare Tohu Rata o Aotearoa
Endorsed CPD Activity

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Data sheet – cycle 1 Monitoring before treatment with ACE inhibitors

Patient	Before starting an ACE inhibitor do patient records document evidence of:			
	Baseline serum creatinine and electrolytes?		Baseline blood pressure?	
	Yes	No	Yes	No
1				
2				
3				
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25				
26				
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28				
29				
30				
Total				
%				

Please retain this sheet for your records to provide evidence of participation in this audit.

Data sheet – cycle 2

Monitoring before treatment with ACE inhibitors

Patient	Before starting an ACE inhibitor do patient records document evidence of:			
	Baseline serum creatinine and electrolytes?		Baseline blood pressure?	
	Yes	No	Yes	No
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30				
Total				
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APPENDIX 1

Audit of Medical Practice (CQI activity) Summary Sheet

Topic:	**Monitoring before treatment with ACE inhibitors**
The activity was designed by (name of organisation if relevant):	**Bpac^{nz}**
Doctors Name:	

FIRST CYCLE

DATA:	Date of data collection:

CHECK:	Describe any areas targeted for improvement as a result of analysing the data collected.

ACTION:	Describe how these improvements will be implemented.

MONITOR:	Describe how well the process is working. When will you undertake a second cycle?

Please retain this sheet for your records to provide evidence of participation in this audit.

SECOND CYCLE

DATA:	Date of data collection:

CHECK:	Describe any areas targeted for improvement as a result of analysing the data collected.

ACTION:	Describe how these improvements will be implemented.

MONITOR:	Describe how well the process is working.

COMMENTS:	

Please retain this sheet for your records to provide evidence of participation in this audit.