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Cardiovascular risk assessment in Australian general practice

Background

Australian general practitioners are encouraged to assess absolute cardiovascular risk (CVR) using a CVR calculator such as the New Zealand Cardiovascular Risk Calculator. However, overseas research suggests that the use of these tools is problematic. Australian data on CVR calculator use is lacking.

Methods

A self administered postal questionnaire exploring GP attitudes toward CVR assessment and management was sent to a random sample of a quarter of South Australian GPs. These GPs were also asked to estimate the absolute CVR for six clinical case scenarios and to provide an outline of their proposed management plan.

Results

Most GPs surveyed (63%) used a CVR calculator. In their responses, they said they felt successful at managing patients with medical risk factors that could be treated with medication; when it came to their ability to influence lifestyle risk factors however, they were generally pessimistic. Absolute CVR was more likely to be under- or over-estimated by GPs surveyed than estimated correctly. But when asked to prioritise their management strategies, GPs mainly favoured interventions that could result in meaningful reductions in CVR factors.

Discussion

A better understanding is needed of how to incorporate CVR calculations into every day clinical practice in a way that both estimates risk accurately and engages and educates patients. Ongoing research into effective GP led interventions that can assist patients to reduce lifestyle risk factors is needed.

■ **Although age standardised deaths from cardiovascular disease (CVD) have been falling since the 1960s, CVD remained the largest single cause of death in Australia in 2002.¹ Annual expenditure on cardiovascular drugs between October 2003 and September 2004 under the Pharmaceutical Benefits Scheme (PBS) was \$1.6 billion, with \$880 million spent on statins alone.²**

Age standardised prevalence of heart, stroke and vascular conditions is higher in women than men; men however, are more likely to die from CVD than women. Most deaths occur in those over 75 years of age.¹ Along with other risk factors – abnormal lipids, smoking, hypertension, diabetes, abdominal obesity, psychosocial factors, low consumption of fruit and vegetables, excess alcohol intake, and physical inactivity – gender and age account for 90% of the calculable risk for myocardial infarction (MI).³

While secondary prevention can significantly reduce CVD risk, primary prevention has obvious benefits for individuals as well as reducing costs to the health care system.⁴ By assessing and managing cardiovascular risk (CVR) factors, general practitioners can play an important role in the primary prevention of CVD.

While some treatment guidelines target single risk factors, the benefit of interventions is clearly related to levels of absolute risk and this should be determined by assessing multiple risk factors. Individuals at high risk can then be identified and managed appropriately.

The New Zealand Cardiovascular Risk Calculator, which is readily available to Australian GPs, is an example of an absolute CVR measurement tool.⁵ Although the use of risk factor tables is encouraged, their use is problematic⁶ and their effectiveness in reducing risk factors and CVD morbidity has yet to be established.⁷

In this study, we sought to identify the methods currently used by GPs to assess CVR, the accuracy of their assessments, and to describe typical strategies used by GPs for management of medical and lifestyle risk factors.

Methods

A postal questionnaire was sent to a random sample of one in 4 GPs across South Australia using division of general practice databases. An offer of a \$20 gift voucher upon return of the questionnaire was used as an incentive to improve response rates. A reminder letter and questionnaire were sent to those GPs who had not responded within 4 weeks.

The questionnaire explored GP attitudes toward CVR assessment and management; it also included six clinical case scenarios (Table 1). For each patient featured in the scenarios, the GPs were asked to estimate the 5 year absolute risk of CVD using whatever resources they had access to, and to provide an outline of a 6 month management plan with up to three strategies organised in order of priority.

Returned questionnaires were collated and the data entered into a database. The statistical software SPSS was then used to provide descriptive statistics.

Ethics approval was obtained from the University of Adelaide Human Research Ethics Committee.

Results

The response rate to the questionnaire was 46% (197/427). The mean age of respondents was 47 years (67% were men) and the mean number of years since graduation was 18. The majority (62%) taught medical students, while 36% trained general practice registrars and 38% were Fellows of The Royal Australian College of General Practitioners (RACGP).

In their responses, the GPs ranked smoking (32% of all respondents) as the most important risk factor with respect to evaluation of CVD, followed by diabetes (25%), hypertension (19%), serum cholesterol (11%) and age (9%). When asked which factors were important to target for the primary prevention of CVD, GPs cited these factors in the same order of importance.

To calculate CVR, most GPs (63%) used a risk factor calculator of some type. Of the GPs who used a calculator, 30% used a calculator incorporated in their medical software (Medical Director), 29% used the New Zealand risk tables and 4% stated that they used another type of calculator. A large group (37%) did not record using a

Table 1. Clinical case scenarios for absolute risk assessment

1. A man, 55 years of age, attends your surgery for a check up. His total cholesterol:HDL ratio is 6.8. He is slightly overweight (BMI 27) and has smoked 10 cigarettes a day for 20 years. He has no other CVR factors
2. A man, 55 years of age, attends your surgery for a check up. His total cholesterol:HDL ratio is 7.2. He is slightly overweight (BMI 27). His BP on three occasions has been 150/95. He has no other CVR factors
3. A man, 42 years of age, has just had lipid studies performed as a screening test. His total cholesterol:HDL ratio is 7.5. His BMI is 23. He has no other CVR factors
4. A woman, 55 years of age, presents to you for a routine check up. She has a BMI of 32 and there is a positive family history of heart disease – her father suffered an MI at the age of 52. Her total cholesterol:HDL ratio is 6.7. She has no other CVR factors
5. A woman, 62 years of age, presents to you for follow up of her recent lipid studies. Her total cholesterol:HDL ratio is 6.4. She has a past history of diabetes mellitus for which she is not currently on any medication. Her BP has been about 140/90 on the last three occasions. She has no other CVR factors
6. A man, 60 years of age, presents to your surgery for a BP check. His BP has been 170/100 on three occasions. He is a smoker (20 cigarettes per day). His total cholesterol:HDL ratio is 5.9. He has no other CVR factors

Table 2. GPs' 5 year estimates of six case scenarios, number of GPs, and (%) of total and calculated absolute risk using the New Zealand risk factor table (n=194)#

Scenario	Very low <2.5%	Low 2.5–10.0%	Moderate 10–15%	High 15–30%	Very high >30%	Percentage risk using New Zealand risk factor table
1	2 (1%)	21 (11%)	102 (53%)	57 (29%)*	12 (6%)	16.1%
2	1 (1%)	19 (10%)	81 (42%)	68 (35%)	23 (12%)	12.8%
3	44 (23%)	97 (51%)	39 (20%)	6 (3%)	6 (3%)	3.8%
4	3 (2%)	33 (17%)	73 (38%)	55 (28%)	29 (15%)	6.0%**
5	2 (1%)	13 (7%)	51 (27%)	105 (55%)	20 (10%)	17.9%
6	1 (1%)	1 (1%)	33 (17%)	81 (42%)	75 (39%)	28.4%

* Bolded results show the percentage of GPs who correctly calculated the absolute CVR

** Absolute risk increased by one level because of family history of premature ischaemic heart disease

Not all respondents answered all case scenarios

Table 3. Results of ranking approaches to management for six clinical case scenarios

Case scenario	Most frequently cited first line of management Proportion (%)	Most frequently cited second line of management Proportion (%)	Most frequently cited third line of management Proportion (%)	Most frequently cited management overall	Absolute risk reduction if first risk factor modified
1	Stop smoking 123/194 (63%)	Reduce cholesterol 87/193 (45%)	Lose weight/exercise 91/193 (47%)	Reduce cholesterol* and stop smoking	16.1 reduces to 10.5
2	Treat BP 101/191 (53%)	Reduce cholesterol** 96/191 (50%)	Lose weight 90/184 (49%)	Reduce cholesterol*	12.8 reduces to 9.3 (if a systolic BP of 130 is achieved) 12.8 reduces to 7.6 (if a systolic BP of 120 is achieved)
3	Reduce cholesterol** 168/191 (88%)	Exercise 79/173 (46%)	Reduce cholesterol* 70/122 (57%)	Reduce cholesterol*	3.8 reduces to 2.6 (if cholesterol target of 5.5 is achieved) 3.8 reduces to 1.5 (if a cholesterol target of 3.5 is achieved)
4	Reduce cholesterol** 103/192 (54%)	Reduce cholesterol	Reduce cholesterol	Reduce cholesterol*	12.5 reduces to 6.6 (if cholesterol target of 5.5 is achieved) Note: Family history of premature heart disease increases risk
5	Stabilise diabetes 80/191 (42%)	Treat hypertension 75/186 (40%)	Reduce cholesterol 79/180 (44%)	Treat hypertension ³	17.9 reduces to 8.7 if the patient does not have diabetes. If systolic BP is reduced to 125 risk decreases to 14.3
6	Treat BP 102/188 (54%)	Stop smoking 91/191 (48%)	Reduce cholesterol 148/186 (80%)	Treat BP and stop smoking	28.4 reduces to 19.4 (if a systolic BP of 135 is achieved) 28.4 reduces to 7.4 (if the person stops smoking)

* Includes 'treat cholesterol' (nonspecific), 'diet change' to reduce cholesterol and 'diet change and consider statin'

** Majority of GPs chose to 'reduce cholesterol via diet'; many GPs (77/192) chose 'lose weight' as the first line of management

particular calculator, and some may have used more than one. Of the calculators GPs mentioned, the majority of users classified them as easy (48%) or very easy (33%) to use.

Almost all GPs felt either 'somewhat' or 'very' successful at reducing medical risk factors by reducing blood pressure (99%), cholesterol (96%) or managing diabetes (92%). However, most felt 'only occasionally' or 'usually not' successful at stopping patients smoking (71%), managing obesity (50%) and encouraging physical activity (63%). Time to achieve goals of treatment reflected these perceptions, with medical conditions usually being controlled in 3–6 months (80%, 66% and 61% respectively), but success with smoking cessation (50%), obesity management (66%) and increasing physical activity (24%), took either 'greater than 12 months' or 'never'.

In the main, the GPs surveyed favoured interventions that could result in meaningful reductions in CVR factors – and, by extension, absolute risk.

Table 2 shows surveyed GPs' estimates of the patient 5 year absolute risk of CVD in response to the six case scenarios (Table 1). The majority of GP responses either under or overestimated cardiovascular risk. The bold results in Table 2 show the percentage of GPs who correctly calculated the absolute CVR.

Management plans for each scenario were coded and the results are presented in Table 3. The final column indicates to what extent the highest priority activity will reduce a patient's absolute CVR.

Discussion

Use of CVR calculators

Our study showed that in a random sample of South Australian GPs most respondents use a risk calculator to help them manage patients at risk of CVD. The majority of GP estimates in response to the six case scenarios either under- or over-estimated CVR. However, when asked to prioritise their management strategies, in the main they favoured interventions that could result in meaningful reductions in CVR factors.

Overseas studies have identified problems with the use of risk factor tables, including the availability of risk factor data⁸ and accuracy of the calculation,^{8,9} with GPs often overestimating CVR – at least for the middle aged – even if they rank risk for individuals appropriately.¹⁰ General practitioners in Switzerland were concerned that such calculations oversimplified risk assessment and potentially put patients at risk of over treatment.¹¹

There have also been concerns about the applicability of Framingham data, which comes from a predominately caucasian

population in the United States of America. New risk tables have been developed, for example in the United Kingdom population, which include measures for social deprivation, family history, body mass index and current treatment for hypertension.¹²

It is important make a calculation of absolute risk as clinical judgment is not a substitute for appropriate evidence based management.¹³

The New Zealand risk factor tables probably provide the best available estimate of CVR for the majority of the Australian population. However, it is appropriate to advise some caution in using existing absolute CVR assessments because a systematic review has indicated that even when applied they may not have any patient benefits.⁷

A Dutch study¹⁴ that examined barriers to implementing CVR calculators found that incorporating risk tables into guidelines was not in itself adequate, and that time efficient strategies were required to aid utilisation. In another qualitative study, GPs said that they used CVR assessment tools as an aid to patient education rather than as a determinant of management. Barriers to using calculators include availability of computer software, concerns about the inconsistency of any results with PBS limitations on lipid lowering agents, and perceptions that patients would not understand the concept.¹⁵

It has also been shown that patients need the highly individualised high risk approach explained,¹⁶ and notwithstanding GPs under- or over-estimating cardiovascular risk, patients can also have different perceptions of their level of risk compared to their GP,¹⁷ which would potentially affect adherence to management strategies.

GP management of CVR factors

Interestingly, the study revealed that GPs felt that they could manage medical risk factors successfully, but that they felt pessimistic about facilitating meaningful lifestyle changes. This view is supported by a recent Cochrane review, which suggests that while some pharmacological interventions for the primary and secondary prevention of CVD are useful, their efficacy in reducing lifestyle risks is less conclusive. General practitioners' perceptions of their success with individual patients appear to be in accordance with intervention research.¹⁸

Limitations of this study

This study had several limitations. First, the response rate was slightly less than 50% despite the use of an incentive and reminder letter. This response rate was better than a similar survey done in Victoria (39%)¹⁰ and comparable to another survey conducted in Switzerland (49.3%).¹¹ The relatively low response rate may have been due to the topic area, the length of the questionnaire (seven pages) or the use of case scenarios that required the calculation or estimation of absolute CVR.

The demographic characteristics of the sample indicate that it was representative of Australian general practice relative to gender

(66% men) and average age (48 years),¹⁹ but that the proportion of GP teachers (62%) and general practice registrar trainers (36%) is higher than would be expected, so we have to be cautious in extrapolating the results to all Australian GPs. Arguably GP teachers and trainers may be more likely to use absolute risk calculators and therefore we may be overestimating their usage in general practice.

Second, the questionnaire relied on self reporting of behaviour. In the first part of the questionnaire, we were interested in attitudes rather than right or wrong answers. In the second section, dealing with the case scenarios, it was clear that we wanted an estimate of the patient's absolute CVR, with or without the use of a risk factor table and a management plan. Again, we did not measure actual behaviour and the results should be interpreted as the potential 'best' management by the participating GPs.

Conclusion

These results and the findings from international studies suggest that we need to better understand how to incorporate CVR calculations into every day clinical practice. Engaging patients in a meaningful way with the process is important. Cardiovascular risk calculations can be used as an education tool to motivate positive change. We also need to develop GP led interventions that can assist patients to reduce lifestyle risk factors.

Implications for general practice

- The majority of respondents to our survey in South Australia report using CVR factor calculators.
- The majority of GP CVR estimates in response to structured case scenarios either under- or over-estimated CVR. Despite this, most opted for strategies that resulted in meaningful reductions in individual absolute CVR.
- Surveyed GPs were optimistic about reducing medical risk factors but were cautious about their ability to improve the lifestyle risk factors of their patients.
- We need to better understand how to incorporate CVR calculations into every day clinical practice in a way that estimates risk accurately and engages and educates patients.
- Ongoing research into effective GP led interventions that can assist patients to reduce lifestyle risk factors is needed.

Conflict of interest: none declared.

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