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Cardiovascular absolute risk assessment and management

Engagement and outcomes in general practice patients

Despite a decline in recent decades, cardiovascular disease (CVD) remains the major cause of death and disability in Australia.[1,2] To improve primary prevention of CVD, many clinical guidelines recommend using cardiovascular absolute risk (CVAR) assessment to guide risk factor management.[3–6] Cardiovascular absolute risk assessment predicts the overall risk of a cardiovascular event over a given time period (usually 5 or 10 years). However, use of CVAR is limited and has not been incorporated well in routine general practice.[7–9] There has been little research on CVAR implementation and an effective implementation strategy has been lacking.[10]

The authors' previous research[11] has developed a theoretical implementation model of CVAR assessment and management in Australian primary healthcare. Actively engaging patients is a key component of this model, empowering patients to be more responsible for their own health and improve clinical outcomes.[12,13] The aim of this study was to explore the impact of implementation, with a focus on patient engagement, as well as to investigate patients' cognitive, behavioural and cardiovascular risk outcomes following intervention.

Method

This study was conducted in Sydney, New South Wales. General practitioners and patients provided both quantitative and qualitative information.[14]

Ethical approval for the study was obtained from the Human Research Ethics Committee of the University of New South Wales.

Five general practitioners from the practice based Primary Health Care Research Network[15] of the University of New South Wales who met the study criteria (working more than four sessions per week in general practice, not involved in other related CVD research programs, and using a computer for consultations) were invited, and all consented to participate. Based on patient selection criteria, each GP purposively recruited 5–6 of their patients, either opportunistically from consultations, or by recalling patients from their databases and ringing to invite them to participate in the study.

Criteria for eligible patients

- Age 40–70 years
- Not Aboriginal or Torres Strait Islander (as the CVAR of this group may be underestimated)
- Without history of CVD and/or stroke
- With at least one cardiovascular risk factor.

In total, 25 patients were invited and all consented to participate in this study.

A CVAR implementation model was applied. This included training GPs in CVAR assessment and management (*Table 1*). Patients completed a self assessment form before the consultation. The New Zealand Cardiovascular Risk Calculator and management guideline was used in the clinical consultations.[5] Based on this guideline, CVAR was categorised as: low risk (<10%); moderate risk (10–15%) or high risk (≥15%). If the patient had any of the following conditions, the CVAR level was considered to be one level higher than that calculated: BP: >170/100 mmHg, total cholesterol: >8.5 mmoL/L; body mass index: >30 kg/m^2, or family history of CVD or stroke if relative aged <60 years.

Patients were asked to complete a simple CVD risk self assessment form in advance and to see their GPs as soon as possible, for a dedicated

Table 1. Description of the CVAR model

Before consultation

GPs

- GPs provided with face-to-face training (in their practices) in using the CVAR assessment calculator (both electronic and paper based formats) and CVAR treatment guideline based on the New Zealand Absolute Risk study[5]
- GPs helped to set up software in Excel format for CVAR assessment
- GPs provided with patient education material to use at end of CVAR consultation

Patients

- Patients sent a self assessment form to complete and a letter requesting they complete the form and attend for a CVAR assessment with their GP

During consultation

GPs

- GPs requested to review the self assessment form, assess patient's risk factors (including smoking, blood pressure, weight, blood lipids and blood glucose level if diabetic) and perform a CVAR assessment
- GPs requested to use the CVAR guideline as a basis for discussion with patients about lifestyle and medication management of their risk. This included management of lifestyle risk factors in all patients and pharmacological interventions in patients at high risk
- GPs requested to arrange referral to smoking Quitline or allied health professionals (eg. physiotherapist, nutritionist/dietician, diabetes educator) where appropriate for patient's condition

Patients

- Patients provided with relevant written education materials at end of the consultation

After consultation

GPs

- During the follow up period GPs provided with regular support telephone calls at least once per month and practice visits if needed

Patients

- Patients monitored and follow up appointments made for risk management for their condition/s

CVAR assessment and management consultation. Patients were also asked to return after 3 months for a follow up CVAR consultation.

Both GPs and patients were interviewed at the end of the study and completed a questionnaire at baseline and follow up. Patients' clinical records were audited at the end of the study. The in depth interviews were conducted using topic guides and took approximately 20–30 minutes. The GP interviews were conducted face-to-face, the patient interviews by phone (*Table 2, 3*). All interviews were audiotaped, transcribed and checked.

Interview transcripts were coded using NVivo software,[16] first with open coding, then axial coding, and finally with selective coding, independently by authors QW and MFH. The coding was also discussed in consultation with other members of the research team until agreement was reached. Using thematic analysis,[17] data was categorised into emerging subthemes by constant comparisons that help to explain the views expressed by participants. Quantitative data was analysed in SPSS[18] with a paired samples t-test for quantitative comparison between baseline and follow up. Quantitative and qualitative data was integrated at two stages: analysis and discussion.[19] In the analysis, qualitative data was investigated from the perspective of individuals in different quantitative categories, to highlight similarities and differences, eg. patient groups at different CVAR levels at baseline and patient groups with and without improved CVAR score at follow up. In the discussion, triangulation and complementarity strategies were used to integrate the quantitative and qualitative findings.[20]

Results

GP characteristics

- Middle aged men (two GPs aged 35–54 years and three GPs aged 55–64 years)
- Working full time (median 16 years working experience).

Patient characteristics

- Aged 40–69 years (mean 57.4 years; seven patients <55 years)
- Eight women
- Nine migrants
- Seven with no school certificate or other

qualification
- Six with university or higher degree
- 14 working full or part time.

Of the 25 patients, three had one risk factor, 11 had 2–3 risk factors, and the remainder had 4–5 risk factors. Apart from one patient with CVAR >30% (who died of an acute myocardial infarction during the follow up period), all patients completed the study.

Patient engagement before and during CVAR consultation

The GPs reported that all their patients completed the risk assessment form well before the CVAR consultation, and the patient self assessment helped the GPs to manage their patients' cardiovascular risk care during the consultation.

In the interviews, all 24 patients reported that the patient risk self assessment form was simple and easy to understand. The majority of patients spent longer than expected completing the assessment (at least 10 minutes). Many stated that they would prefer to complete it at home rather than in the waiting room because they felt that it would be more private or they would have liked to involve their families in discussion about risk. All patients found the self assessment helpful in raising their awareness and motivating them to self care.

'My reaction would be I'd have to say, well I'd better start looking at the way I live even though we exercise, and eating and drinking habits. I'd have to assess that and I'd definitely try to rectify the balance, that's for sure.' (Patient 1.3)

Another advantage of the self assessment form was that it prompted the GPs to initiate a risk discussion with patients and to find common ground with them.

'So there's certain things, they do make comments about what they can achieve or what they can't achieve and I think it's good because I can take into account what the patient can do, what they can't do and then maybe I can have a different plan or management for the patient.' (GP 5)

As stated in the interviews, patients' immediate responses to the CVAR result varied during the consultations. Some patients were surprised if their CVAR was different (higher or lower) from what they expected. However, no patient in this study reported anxiety about the CVAR results. Patients felt informed of the risk, encouraged or reassured if their risk score was low, or they believed their

risk score would reduce if they could take action to modify a risk factor.

'I haven't got the professional or technical knowledge to know but I suppose I can figure out that 3.5% is better than 35%. I suppose the more important thing for me was to know that I did have blood pressure, which I didn't think I had.' (Patient 2.2)

In general, many patients were pleased to observe and accept their GP calculating their CVAR score and demonstrating how the score could improve in response to management. General practitioners felt that the CVAR assessment improved their patients' awareness of CVD risk and helped to motivate and encourage them and reduce any anxiety during the consultation.

'I think that was pretty clear in all the patients, they suddenly realise that they have something, have some risk that they know that their personal habits definitely contribute to that risk.' (GP 5)

The consultation prompted some patients to reflect on their cardiovascular risk and to ask more questions of their GP.

'Since I've started this I've asked a few more questions and I'm getting more answers and I get a better understanding. To get a good understanding it reduces all stress.' (Patient 3.6)

Cognitive and behavioural outcomes following intervention

In the questionnaire, 10 out of 25 patients reported limited understanding of CVD risk at baseline. At follow up only four patients continued to report limited understanding, with all the others reporting good or very good understanding of CVD risk.

'A greater awareness from my own point of view in terms of monitoring and being a person that has maybe greater physical activity, a better diet and generally speaking trying to look after your health better, so I've gained that from it for sure.' (Patient 5.2)

Most patients stated in the interviews that they were more motivated in their self management of CVD risk and more involved in self management of risk following the intervention. Some stated that they had improved their lifestyle behaviours including better eating and exercise behaviours, or their self monitoring of risk factors after the consultation.

'Well, I'm very particular in what I eat now. I mean not that I've ever been a big eater of fatty

foods but everything I pick up in the supermarket now, I look what the fat content is.' (Patient 3.1)

Patients who thought their self care was already optimal reported little change in their behaviours. However, they felt that their behaviours had been reinforced by this CVAR consultation.

'I think it's just reinforced it because I'm involved in managing my own health and wellbeing with diabetes.' (Patient 2.5)

Cardiovascular risk following intervention

For all the risk indicators there was a trend for physiological risk factors and CVAR to improve at 3 months follow up (*Table 2*). Of the 25 patients at baseline, four were at high risk, 17 at moderate risk and four at low risk. All patients with mild risk and all but one of those at moderate risk at baseline maintained this level of risk at follow up (*Table 3*). Among the four patients at high risk, one died of an acute myocardial infarction during the study period. The CVAR scores of the other three improved, bringing them down to moderate or mild risk levels. In general, more than half of the total

patients (17/25, 68%) had improved CVAR scores at follow up.

Qualitative comparison of patients in different CVAR levels

Patients at low CVAR reported less change in their self management practices. All patients with moderate CVAR reported improved practices of self management at follow up. Patients at moderate CVAR were also more likely than those at low CVAR to report that performing the self assessment form had been helpful in increasing their awareness. Patients at high CVAR found it more difficult to manage risk factors such as overweight or smoking, as reported at follow up. For instance, one patient at high CVAR found it more difficult to tackle some risk factors than others, especially smoking.

'I am working on changing the smoking but that is the hardest part. I do not find exercise hard. I do not find eating properly hard but I do find it difficult to stop smoking… [as] I do not think of it as a life threatening thing.' (Patient 3.5 [high risk])

Some patients with high CVAR began to contemplate making a change in their behaviour

Table 2. CVD risk factors and CVAR at baseline and follow up

	Baseline	Follow up*
Systolic blood pressure (SBP) (mmHg)	130.7 (13.7)	127.0 (10.9)
Diastolic blood pressure (DBP) (mmHg)	80.8 (6.0)	78.6 (7.9)
Total cholesterol (mmol/L)	5.1 (1.5)	4.8 (0.8)
High density lipoprotein (HDL) (mmol/L)	1.5 (0.3)	1.5 (0.3)
Low density lipoprotein (LDL) (mmol/L)	3.0 (1.4)	2.7 (0.8)
Triglycerides (TG) (mmol/L)	1.6 (0.7)	1.3 (0.6)
Body mass index (BMI) (kg/m^2)	29.4 (5.9)	29.2 (5.9)
Current smoking	3	3
CVAR (%)	7.1	5.4

* For the patient who died during the follow up period, risk was considered as 'no change' at follow up

Table 3. Patient numbers with and without changed CVAR score and level

Baseline		Follow up	
CVAR level	Number of patients	Changed CVAR score	Changed CVAR level
Low (<10%)	4	−1, +3	
Moderate (10–15%)	17	-10, +7	+1
High (>15%)	4*	−3	−3
Total	25	−14, +10	−3, +1

+ = increase; − = decrease

* One patient with CVAR >30% at baseline died of a heart attack during the study period, risk was considered as 'no change' at follow up

after the intervention despite reluctance or slowness to act.

'I think I've tried to look at it a little bit differently than before instead of taking things for granted. Yeah, I think I've got a little bit of another view on things. I mean it's nothing over the top. It's just a little bit. Little by little, you get there.' (Patient 3.4 [high risk])

Patients with an improved CVAR score at follow up (regardless of the degree of improvement) tended to demonstrate better understanding of CVD risk and greater involvement in self management of their lifestyle than those without an improved CVAR score.

'Yeah, in my particular case I'm probably a little bit more aware of it than a lot of other people. When I say that, most cases when I go to the doctor I know what my problem is before I go to him.' (Patient 1.1)

Discussion

Patient engagement

In the CVAR implementation model, patients were initially engaged by being introduced to risk self assessment using a self assessment form to complete in the waiting room before the consultation. Patients felt this was helpful in motivating/reinforcing self care and GPs found that it prompted them to initiate the risk discussion during the consultation. This is consistent with the findings of other research, that self assessment of risk can help inform patients about treatment decisions and their behaviour.[21]

As has been found in other research,[22] no patients expressed anxiety about their risk results in the study. This included those with high or unexpected risk levels. Most patients reported feeling encouraged and reassured, regardless of their risk score, as long as they were shown how their risk could be reduced by changing their management or behaviour. Enhanced involvement of patients in shared decision making via decision aids has been associated with higher patient satisfaction and involvement, less decisional regret, and improved adherence and clinical outcomes.[23,24] It has been shown that high levels of patient participation significantly influence the extent and type of information primary physicians provide.[25] Physicians' communication style in turn affects patient participation.[26]

Therefore, the authors conclude that actively engaging patients by using an appropriate self assessment form to prompt both patients and GPs, using CVAR calculators to motivate and reassure patients, and negotiating and sharing care with

patients are all crucial to improving the use of CVAR assessment and management, and this needs to be incorporated into the standard procedure for conducting CVAR consultation.

Impact on patient outcomes

Most patients demonstrated positive self reported cognitive and behavioural outcomes following the intervention. Patient understanding and awareness of CVD risk and motivation to self manage improved at follow up. These positive cognitive and behavioural outcomes may have contributed to the positive trend in single risk factors and CVAR, even in the short period of follow up. Fostering self management practices in patients with high CVAR was reported to be difficult. This suggests that although high risk patients may benefit most from the CVAR assessment and management, they require specific strategies such as health coaching and referral for self management support and modification of lifestyle risk factors.

A mixed method approach was adopted in collecting information from GPs and patients, using multiple study measures. Exploration and integration of qualitative and quantitative information helped to probe issues relating to the study aims. It should be noted however, that all participants were in urban practices in Sydney and the results might not be generalisable to other geographical areas. The small sample size and short follow up time period does not allow conclusions to be drawn about the effectiveness of the model in improving patient outcomes. This will be the subject of a future randomised controlled trial.

Conclusion

Despite some limitations, our findings may have practice and policy implications. Before patients can actively engage in CVAR assessment and management, there is benefit in them being adequately informed and prepared using multiple strategies (eg. patient risk self assessment and CVAR calculator). This has implications for the organisation of care within the practice and the funding and support provided to general practice for promoting CVAR assessment and management in the future.

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