Are guidelines on cardiovascular risk prevention comprehensive enough? Focus on the 2005 Joint British Societies' Guidelines

Shahirose Jessani & Gregory YH Lip†

†*Author for correspondence*
University Department of Medicine, City Hospital, Birmingham B18 7QH, UK
Tel.: +44 121 507 5080
Fax: +44 121 554 4803
g.y.h.lip@bham.ac.uk

'...the increase in CVD may translate into major clinical and economical implications, since CVD is not only a leading cause of global mortality, but also has a massive economic impact.'

Cardiovascular disease (CVD) has burgeoned from a relatively minor disease worldwide to a leading cause of morbidity and mortality. More worryingly, by the year 2020, CVD is projected to surpass infectious disease as the world's leading cause of death and disability [1]. This is partially owing to improved public health measures and medical care leading to longer life spans and reduced mortality from other causes; although a substantial portion can be attributable to adverse lifestyle changes accompanying industrialization, urbanization and increased discretionary income, increasing the degree of exposure to CVD risk factors. In absolute terms, the increase in CVD may translate into major clinical and economical implications, since CVD is not only a leading cause of global mortality, accounting for almost 17 million deaths annually [2], but also has massive economic implications. In the UK alone, for example, CVD-related costs in 2004 amounted to approximately GB£29 billion [3].

In order to blunt the effect of the global explosion in CVD, it is crucial to understand and reduce the global increase in CVD risk factors. For over 10 years, attempts have been made to define the problem and promote comprehensive action plans and guidelines. In 1996, the European Action on Secondary Prevention by Intervention to Reduce Events (EUROASPIRE) I survey, involving patients with established coronary heart disease in nine European countries, confirmed the substantial potential for cardiovascular risk-factor modification [4]. This provided the impetus for comprehensive CVD prevention guidelines, such as the 'Joint British Societies' (JBS) guidelines in the UK.

The first set of guidelines, JBS 1, were published in 1998 [5]. The main highlight of JBS 1 was coronary heart disease (CHD), with a focus on those with established CHD or at high risk of developing the disease. The importance of both lifestyle and risk-factor intervention was stressed, coupled with appropriate drug therapies to lower blood pressure, modify lipids and reduce glycemia. However, the results of the EUROASPIRE II survey [6], conducted approximately 5 years after EUROASPIRE I and approximately 2 years after publication of the JBS 1 guidelines, were quite disappointing, showing lack of any improvement in blood pressure management, and that most CHD patients were still not achieving the cholesterol target of less than 5 mmol/l. Smoking and obesity still remained highly prevalent and, worryingly, of those who continued to smoke, few reported receiving appropriate advice.

This dire state of affairs in 2002 was further evidenced from a primary care study involving five general practices, which showed that even though 20% of the patient sample had a CHD risk of 30% or more over 10 years, only 7% of these had a statin prescribed, and less than half of hypertensive patients had their serum cholesterol and high-density lipoprotein (HDL) cholesterol measured [7]. Similar suboptimal prescribing has been noted by other investigators [8]. Despite their high CHD risk, patients with diabetes mellitus (DM) had poor cardiovascular risk-factor intervention [9,10].

These pitfalls in achieving targets, and the emergence of new evidence on the management of hypertension, lipids and DM since JBS 1 was published, provided further impetus to revise the recommendations for CVD prevention. The rewrite materialized as JBS 2, published in 2005 [11]. Indeed, JBS 2 now encompassed the whole spectrum of CVD, rather than just CHD *per se*, which was the main highlight of JBS 1. The tone of JBS 2 advocates a focus on those patients with established disease (secondary prevention) and those at high risk (primary prevention), in particular, those with a CVD risk of 20% or more over 10 years. The concept most strongly recommended by the new JBS 2 guidelines is the estimation of total cardiovascular risk, an approach that is now promoted internationally [12]. Since CVD is multifactorial in origin, the risk factors tend to have a multiplicative

Future Drugs Ltd

effect, and thus it is important to take into account all risk factors in a holistic manner, when assessing the overall CVD risk of an individual, as opposed to focusing on one single, individual risk factor [13].

However, the dilemma regarding what to do for CVD prevention still remains. Despite having similar comprehensive guidelines, major gaps and shortfalls still exist between what is intended, in terms of reduction of cardiovascular risk factors, and what is achieved. Therefore, we need to scrutinize the finer details of what goes wrong. Is it something to do with the guidelines or do we need to intervene more broadly than just publishing a set of guidelines?

With most guidelines, many lag behind the available evidence. For example, JBS 1 suggested that, for primary prevention, statins should be prescribed for those with a 10-year CHD risk of greater than 30% and, if resources allowed, those at the next level of risk (≥15%) should be treated [5]. The skeptic would argue that this recommendation was not even in keeping with the scientific evidence at the time, when trials had already shown a clear benefit of statins in primary prevention of CHD risk of around 10% over 10 years [14].

Similarly, JBS 2 lags behind the available evidence and a few of its recommendations are not evidence-based. For example, if one has to maximize CVD risk reduction then optimal blood-pressure control is crucial, since approximately two-thirds of the CVD burden is attributable to poor blood-pressure control [15]. Furthermore, it has been estimated that control of systolic blood pressure to 140 mmHg would potentially prevent 41,400 ischemic heart disease deaths and around 21,000 deaths from stroke each year in the UK alone [16]. JBS 2 also adopted a treatment algorithm including β-blockers as first-line agents for hypertension, even though recent trial data suggest that they should not be so, except in the presence of heart disease [17].

The JBS 2 guidelines on the assessment and management of impaired glucose regulation places greater emphasis on fasting glucose as the initial screening test, even though there is strong evidence from large studies to suggest that fasting glucose is a poor indicator of impaired glucose regulation in both acute and stable cardiovascular disease [18,19]. Indeed, extrapolating data from the Framingham study that mainly assessed white Caucasian patients to other ethnic groups (e.g., South Asians and black African/ Caribbean) is fraught with difficulties. JBS 2 atempts to overcome this by suggesting that South Asians have a CVD risk 1.4-times greater than that predicted by the charts [11]. The latter correction factor is not evidenced based and is inappropriately derived from standardized mortality rates (SMRs). Thus, when guidelines lag behind the evidence and are not evidence based, achieving adequate measurable clinical indicators of outcome to improve quality of care is at best, a utopia.

'...effective public health and community-based programs can play a pivotal role in raising awareness, facilitating lifestyle changes, entry and retention in the healthcare system and compliance with drug therapy.'

Hence, not only do we need evidence-based and updated guidelines, but there is also the need to intervene in various other areas to help overcome the so-called inertia in clinical practice, improve implementation of guidelines and achieve intended targets. We should take this opportunity for re-examining our overall approach to the prevention of CVD, especially at the primary care level. Since primary care is a natural setting for the promotion of health, and despite having success in implementing some public health programs, it has a patchy record in prevention. One of the most important steps towards improving the quality of CVD preventive care is to educate and update primary care physicians, enabling them to make decisions based on evidence rather than their individual perceptions. For example, a gender disparity in recommendations for preventative therapy was revealed from a study that evaluated physicians' adherence to CVD prevention guidelines according to patient characteristics, particularly gender. Females were being undertreated due to their perceived lower risk, despite them having similar calculated risk compared with men [20]. More worryingly, physicians did not rate themselves very effective in their ability to help patients prevent CVD.

However, family care physicians may be above average, although the population they serve may have insufficient knowledge of cardiovascular risk factors and the correct approach to reduce their global risk [21]. In such a scenario, effective public health and community-based programs can play a pivotal role in raising awareness, facilitating lifestyle changes,

entry and retention in the healthcare system and compliance with drug therapy [22]. We must involve those at risk of CVD in decision making regarding their own health rather than just impose guidelines and therefore, we find approaches such as the collaborative goal setting to be more effective in encouraging healthy behaviors, compared with the more traditional clinician-directed advice [23].

Other measures that have been shown to improve implementation of guidelines and enhance achievement of treatment goals are:

- Follow-up of patients in specialized clinics [24]
- Running nurse-led secondary preventative clinics in primary care [25]
- Using the screening and monitoring the approach

The latter involves cyclic monitoring and individual treatment of patients at cardiovascular risk using the electronic medical records [26]. However, its not only measures involving more staff or technology that have shown benefits, as even simple interventions that take 1–2 min to deploy have been successful. For example, healthcare professionals issuing prescriptions that offer patients discounts on fruits and vegetable purchases would make a great difference [27].

In conclusion, a wide range of measures – from very simple to sophisticated – exist to overcome the gaps between clinical evidence and practice, but one measure that may have the highest potential to make a difference is the measure to embed prevention into day-to-day practice rather than emphasize it in an episodic manner. Hopefully, things will only get better.

Bibliography

1. Levenson JW, Skerrett PJ, Gaziano JM. Reducing the global burden of cardiovascular disease: the role of risk factors. *Prev. Cardiol.* 5, 188–199 (2002).
2. Smith SC, Jackson R, Pearson TA *et al.* Principles for National and Regional Guidelines on Cardiovascular Disease Prevention. A scientific statement from the World Heart and Stroke Forum. *Circulation* 109, 3112–31121 (2004).
3. Luengo-Fernandez R, Leal J, Gray A, Petersen S, Rayner M. The cost of cardiovascular disease in the UK. *Heart* 92(10), 1384–1389 (2006).
4. Aspire Steering Group. A British Cardiac Society survey of the potential for the secondary prevention of coronary disease: ASPIRE (Action on Secondary Prevention through Intervention to Reduce Events). Principal results. *Heart* 75, 334–342 (1996).
5. JBS 1: Joint British Societies' guidelines on prevention of cardiovascular disease in clinical practice. *Heart* 80(Suppl. 2), S1–S29 (1998).
6. EUROASPIRE I and II Group. European Action on Secondary Prevention by Intervention to Reduce Events. Clinical reality of coronary prevention guidelines: a comparison of EUROASPIRE I and II in nine countries. *Lancet* 357(9261), 972–973 (2001).
7. Green R, Kwok S, Durrington PN. Preventing cardiovascular diseases in hypertension: effects of lowering blood pressure and cholesterol. *QJ Med* 95, 821–826 (2002).
8. Gulliford MC, Charlton J, Latinovic R. Trends in antihypertensive and lipid-lowering therapy in subjects with Type II diabetes: clinical effectiveness or clinical discretion? *J. Hum. Hypertens.* 19(2), 111–117 (2005).
9. Colhoun HM, Dong W, Barakat MT, Mather HM, Poulter NR. The scope for cardiovascular disease risk factor intervention among people with diabetes mellitus in England: a population-based analysis from the Health Surveys for England 1991–1994. *Diabet. Med.* 16, 35–40 (1999).
10. Emberson JR, Whincup PH, Lawlor DA, Montaner D, Ebrahim S. Coronary heart disease prevention in clinical practice: are patients with diabetes special? Evidence from two studies of older men and women. *Heart* 91, 417–418 (2005).
11. JBS 2: Joint British Societies' guidelines on prevention of cardiovascular disease in clinical practice. *Heart* 91, 1–52 (2005).
12. Smith SC, Jackson R, Pearson AT *et al.* Principles for national and regional guidelines on cardiovascular disease prevention. A scientific statement from the world Heart and Stroke Forum. *Circulation* 109, 3112–3121 (2004).
13. Anderson KM, Odell PM, Wilson PW, Kannel WB. Cardiovascular disease risk profiles. *Am. Heart J.* 121, 293–298 (1990).
14. Downs GR, Clearfield M, Weiss S *et al.*, for the Afcaps/TexCaPS Research Group. Primary prevention of acute coronary events with lovastatain in men and women with average cholesterol levels: results of the AFCAPS/TEXCAPS (Air force/Texas Coronary Atherosclerosis Prevention study). *JAMA* 279, 1615–1622 (1998).
15. World Health Organisation. *World Health Report 2002: Reducing Risk, Promoting Healthy Life.* World Health Organization, Geneva, Switzerland (2002).
16. He FJ, MacGregor GA. Cost of poor blood pressure control in the UK: 62,000 unnecessary deaths per year. *J. Hum. Hypertens.* 17(7), 455–457 (2003).
17. Beevers DG. The end of β-blockers for uncomplicated hypertension? *Lancet* 366, 1510–1512 (2005).
18. The DECODE Study Group, on behalf of the European Diabetes Epidemiology Group. Glucose tolerance and mortality: comparison of WHO and American Diabetes Association diagnostic criteria. *Lancet* 354, 617–621 (1999).
19. Bartnik M, Ryden L, Ferrari R *et al.*, on behalf of the Euro Heart Survey Investigators. The prevalence of abnormal glucose regulation patients with Coronary artery disease across Europe. The Euro Heart Survey on diabetes and the heart. *Eur. Heart J.* 25, 1880–1890 (2004).
20. Mosca L, Linfante AH, Benjamin EJ *et al.* National study of physician awareness and adherence to cardiovascular disease prevention guidelines. *Circulation* 111, 499–510 (2005).
21. Celentano A, Palmieri V, Arezzi E *et al.* Cardiovascular secondary prevention: patients' knowledge of cardiovascular risk factors and their attitude to reduce the risk burden, and the practice of family doctors. The "Help Your Heart Stay Young" study. *Ital. Heart J.* 5, 767–773 (2004).
22. Egan BM, Lackland DT. Strategies for cardiovascular disease prevention: importance of public and community health programs. *Ethn. Dis.* 8, 228–239 (1998).

23. MacGregor K, Handley M, Wong S *et al.* Behaviour-change action plans in primary care: a feasibility study of clinicians. *J. Am. Board Fam. Med.* 19, 215–223 (2006).
24. Gavish D, Leibovitz E, Elly I, Shargorodsky M, Zimlichman R. Follow-up in a lipid clinic improves the management of risk factors in cardiovascular disease patients. *Isr. Med. Assoc. J.* 4, 694–697 (2002).
25. Murchie P, Campbell NC, Ritchie LD, Thain J. Running nurse-led secondary prevention clinics for coronary heart disease in primary care: qualitative study of health professionals' perspectives. *Br. J. Gen. Pract.* 55, 522–528 (2005).
26. Rabinowitz I, Tamir A. The SaM (Screening and Monitoring) approach to cardiovascular risk-reduction in primary care- cyclic monitoring and individual treatment of patients at cardiovascular risk using the electronic medical record. *Eur. J. Cardiovasc. Prev. Rehabil.* 12, 56–62 (2005).
27. Kearney M, Bradbury C, Ellahi B, Hodgson M, Thurston M. Mainstreaming prevention: prescribing fruit and vegetables as a brief intervention in primary care. *Public Health* 119, 981–986 (2005).

Affiliations

Shahirose Jessani, Research fellow
University Department of Medicine,
City Hospital, Birmingham B18 7QH, UK

Gregory YH Lip, Professor of Cardiovascular Medicine
University Department of Medicine,
City Hospital, Birmingham B18 7QH, UK
Tel.: +44 121 507 5080
Fax: +44 121 554 4803
g.y.h.lip@bham.ac.uk