

Risk Factors & Cardiovascular Disease

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I. M. Graham

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Invited Editorial

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CARDIOVASCULAR RISK ESTIMATION AND MANAGEMENT: CAN WE GLIMPSE THE FUTURE?

A “risk factor” is generally defined as a characteristic of an individual that is associated with the subsequent development of a disease. Establishing a causal link between a putative risk factor and a disease is easy if a single factor is associated with the disease and if its removal is curative; myxedema is caused by deficiency of thyroxine, and its supplementation is curative. Sometimes a causal agent, for example, the tubercle bacillus, needs the appropriate circumstances to become clinically manifest. But the atherosclerosis underlying heart attack and stroke is associated with multitudinous factors. Many of these are markers of a developed or “Western” lifestyle, but only some are “causal” in the sense that the likelihood of causality is sufficient to justify a clinical or public health intervention. Defining the criteria for causality and judging when the benefits of intervention outweigh adverse effects has challenged basic science, epidemiology, and clinical and public health medicine for the past century.

In his lead article in this issue of *Dialogues*, Guy De Backer casts a dispassionate eye on risk. He notes that the concept can be extended beyond prevention in the individual to public health strategy and to gaining insight into possible pathophysiological mechanisms. The primacy of the “big five”—age, gender, blood cholesterol, blood pressure, and smoking—remains intact. Of these, age is not a risk factor as such, but merely a measure of exposure time—the older one is, the longer one may have been exposed to a raised blood cholesterol or smoking. But raised blood pressure and cholesterol and smoking are clearly causal and their removal or reduction unequivocally reduces risk. Female gender, as we shall see, implies a deferral, but not a reduction in risk.

The benefits of exercise, avoidance of overweight, and healthy nutrition are based on observational epidemiology, clinical trials, meta-analyses, and systematic reviews. While none of these factors is as amenable to randomized control trials like blood pressure or hyperlipidemia, there is little doubt that attention to these aspects can reduce the ● ● ●

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risk of the “metabolic syndrome,” diabetes, hypertension, hyperlipidemia, consequent cardiovascular disease (CVD), and many comorbidities. The role of psychosocial factors is also considered in this issue, and De Backer looks also at possible new risk factors.

The balance between total and absolute risk is dealt with carefully. While absolute risk guides management decisions in the individual, a high relative risk in a young person may flag the need for lifestyle measures to prevent a high absolute risk in later life. The assessment of both requires the ability to assess the impact of multiple risk factors using an assessment tool such as the Systematic CORonary Risk Evaluation (SCORE) risk charts.¹

Most deaths in a community come from those at only modestly increased risk simply because they are so numerous, yet high-risk individuals gain most from preventive measures²; so community and high-risk detection strategies should be regarded as complementary rather than competitive.

Karin Schenck-Gustaffson establishes clearly that the apparent protection of women from CVD is a myth—40% of women die from CVD, compared with 3% of deaths from breast cancer. They merely die later than men, and more frequently from stroke. Current risk estimation systems underestimate the problem, especially by not accommodating older women. There is a dilemma in that younger women may be undermanaged (too little risk assessment and advice), but potentially overtreated with drugs such as statins (low absolute risk and inadequate trial evidence of benefit). Above all, there is a need for increased awareness of the problem of CVD as the major cause of death in women, the recruitment of more women into trials of risk factor management, and research into strategies of risk assessment and management that are focused on women.

“The poor die young.” A cliché, perhaps, but nonetheless true. Roberto De Vogli and Michael Marmot find that the usual considerations as to whether socioeconomic conditions may be risk factors, confounders, or modifiers of risk insufficient. Rather, they argue that socioeconomic factors are the “cause of the causes” of heart disease. Risk factor management at the individual level may not reduce the inequalities in risk that are socially determined. A broader approach would seem to be needed to address poverty, inequality, urban planning, social participation, transportation, and the work environment. The potential role of multinational corporations for good or bad is enormous: do they merely transfer the sale of tobacco and foods high in saturated fats to developing countries? Can business interests be harmonized with social responsibility?

The idea that all animals, including man, enjoy a finite number of heartbeats before they die is fascinating. François Paillard and Jean-Claude Tardif note that an increased heart rate seems to promote atherogenesis, ischemia, dysrhythmias, and death. β -Blockade



reduces heart rate. It reduces mortality in subjects after myocardial infarction and in heart failure. It is tempting, maybe logical, to conclude that β -blocker-independent heart rate reduction will improve life expectancy. We may hope so, but we do not yet know so.

Anthony Wierzbicki does a noble job in summarizing 10 seminal papers concerned with risk factors. He defines the characteristics of healthy populations, especially with regard to blood pressure, cholesterol, vegetable consumption, and exercise. One might take issue with the admonition “no sex”—“no unsafe sex” might be preferable. Your editorialist knows of no evidence that sex as such is other than healthy. Also, for “no alcohol” the evidence might perhaps permit modest—but not excessive—alcohol.

So, what are the challenges for the prevention of CVD? Perhaps to:

- Understand the social determinants of health and how to change them.
- Understand how to promote exercise, healthy nutrition, avoidance of overweight and tobacco, and do not ban the moderate use of alcohol.
- Listen and learn with regard to gender inequalities.
- Use drug treatments effectively and in accordance with the evidence base.
- Understand the power of health professionals as political advocates for health.
- Engage with multinational companies to encourage them to adopt socially responsible policies that conform to public health requirements.

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