Cardiovascular Risk Factors in Young Adults – Are We Neglecting the Next Generation?

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Age-standardized death rates from cardiovascular disease have decreased substantially since the 1960s. It has been estimated that 50–75% of this reduction can be attributed to population-wide improvements with regard to the major risk factors, particularly smoking, cholesterol, and blood pressure, the rest being attributed to medical interventions such as coronary care units, emergency cardiac care, medical therapy and invasive interventions [1,2]. The INTERHEART study, conducted in 52 countries around the globe, suggests that 90% of the population-attributable risks for coronary heart disease can be accounted for by potentially reversible risk factors [3]. Long-term prospective epidemiologic studies have shown consistently that persons with healthy lifestyles and few risk factors have a low risk of heart disease and stroke throughout their life [4]. Despite this, there is still a worldwide epidemic of cardiovascular disease and stroke, and the World Health Organization estimates that by the year 2020 cardiovascular disease and stroke will be the leading causes of death and disability worldwide. It is thus not surprising that the medical literature contains abundant information on strategies designed to identify and reduce the prevalence of cardiovascular risk factors. Although sometimes regarded as not cost-effective, it has been estimated that primary prevention of CHD has a fourfold greater impact on mortality than does secondary prevention [2].

In this issue of *IMAJ*, Tekes-Manova and colleagues [5] present data from a prospective evaluation of Israeli army personnel, 25–55 years old, who were examined at the Staff Periodic Examination Center as part of a routine periodic medical examination program instituted by the Israel Defense Force. The authors arrive at the alarming conclusion that over half of the men and 43% of the women below age 35 in this cohort had at least two of the following reversible cardiovascular risk factors: diabetes, hypertension, obesity, smoking, dyslipidemia and sedentary lifestyle. The frequency of most of these risk factors appears to increase in the older age groups, implying an escalating global cardiovascular risk in the Israeli adult population. If true, these data obviously imply failure of the primary prevention services in Israel, at least as applied to this specific cohort. However, before we shout "the king is naked!" we need to ask the following

questions about the findings presented: Is it true? Is it new? Is it generalizable? What are the practical implications?

While I have no tools to evaluate the adequacy of the methods used for data acquisition in the Staff Periodic Examination Center, I do have some reservations about their interpretation, especially regarding the four factors that account for over 90% of the potential risk in this cohort: smoking, dyslipidemia, obesity, and sedentary lifestyle. Smoking was defined rather loosely as "smoking one or more cigarettes, cigars or pipe in the last 3 months." Similarly, it is unclear how much risk is inflicted by elevated levels of total cholesterol (> 240 mg/dl) or triglyceride (> 150 mg/dl) in the presence of a desirable ratio of low density lipoprotein-cholesterol to high density lipoprotein-cholesterol [6], as may have occurred in some of the subjects. More importantly, although obesity and sedentary lifestyle are positively associated with CHD risk, their independent contribution to the disease is less strong than the other risk factors. A scientific committee of the American Heart Association defined these two factors as "contributary risk factors" that exert much of their adverse influence on development of CHD through the major risk factors and are thus considered targets for modification, but did not include them in the quantitative risk assessment equations [7]. Instead of simply counting the number of risk factors, it might have been more useful to calculate the global cummulative cardiovascular risk (extrapolated to age 60 years). While there is no direct evidence that such an approach accurately predicts future CHD risk for young adults, the availability of community-based integrated databases in all Israeli health management organizations provides a unique opportunity to study this question.

Few studies have previously documented the prevalence of cardiovascular risk factors in representative Israeli cohorts, especially in this young age group. However, some insight into the prevalence of these risk factors can be gained from data published by the Israel Center for Disease Control [8] and the first Israeli national health and nutrition survey (MABAT) [9,10] conducted by the Israel Center for Disease Control and the Nutrition Services of the Israel Ministry of Health. The prevalence of risk factors for males and females respectively in the age group 35–44 years was around 0.7% and 1.2% for diabetes, 40% and 31% for smoking, 21% and 22% for body mass index > 30 kg/m^2, and 84% and 76% for sedentary lifestyle. In 2003, 43% of males and 39% of females were smoking at discharge from their compulsory

CHD = coronary heart disease

army service. Although the authors of the current study do not specify the prevalence of each individual lipoprotein abnormality, their findings do not appear to be dissimilar to those found by Avizohar and Brook [11] in a healthy Israeli working population during routine annual health checkups. Thus, it appears that the prevalence of risk factors in the current study is not higher, and perhaps somewhat lower, than previously published data in Israel.

The issue of generalizability is difficult to speculate. Young adults who choose to enter a lifelong career in the IDF might have different baseline health characteristics than their peers who choose a civilian career. In addition, the often long work hours, dependence on the army kitchen for nutrition, and other occupational characteristics that are unique to army service may influence lifestyle-related risk factors.

So what are the implications of the data presented by Tekes-Manova et al? Despite the aforementioned shortcomings of the study, the data suggest that the prevalence of correctable cardiovascular risk factors in this young Israeli population is alarmingly high. If a healthy lifestyle is defined as "aiming for a healthy weight, recommended blood levels of LDL-cholesterol, HDL-cholesterol and triglyceride, normal blood pressure and blood glucose, be physically active and avoid use of and exposure to tobacco products" [12], then less than 15% of the examinees live a lifestyle compatible with "good health." This is despite the abundance of advocation for health promotion in the media, legislation against smoking in public places, and wide dissemination of guidelines for primary prevention. Evidently, our health promotion campaign is inadequate. Some of the fault can be attributed to lack of both time and motivation by primary care physicians to become involved with health promotion [13]. However, if the battle against cardiovascular disease is to succeed, it cannot be left solely to physicians. A population-based approach is warranted, in which the entire distribution of risk factors and risk is shifted toward lower levels through population-wide interventions [14]. Since lifestyle habits, as well as atherosclerosis itself, begin to be established in childhood, such endeavors should begin in kindergarten and continue throughout the school years and early adulthood [15]. Unfortunately, current disease control efforts are underfunded and fragmented. In the United States, the national investment in prevention was estimated at less than 3% of the total annual healthcare expenditure [16]. In Israel, several modalities used in health promotion – such as dietary counseling, smoking cessation workshops and some medications used for modifying risk factors – are not appropriately reimbursed. Each of the four health maintenance organizations, as well as the Israel Heart Society and many of the professional medical organizations associated with cardiovascular risk factors (diabetes, hypertension, etc.) has its individual prevention projects. Coordination of these activities under a common leadership has recently been attempted, albeit with limited success so far. It is imperative

to promote collaboration between healthcare providers, professional medical associations and governmental agencies in order to increase public awareness about healthy lifestyles through mass media campaigns, enact legislative action that will result in more funding for and access to primary prevention programs, and implement comprehensive health promotion and disease-prevention programs [14,16]. Private industry, local municipalities and employers should be geared towards the provision of access to better quality, inexpensive 'heart-healthy' foods and a health-promoting environment. Strategies should be developed to encourage primary care physicians to implement currently available prevention guidelines, and compensate them according to their achievements. More emphasis should be placed on routine annual checkups for the early detection of high risk individuals. In this respect the IDF serves as a good model by establishing the Staff Periodic Examination Center; however, the authors appropriately emphasize the need for going one step further and implement health-promotion programs in the IDF that will provide coordinated care for individuals identified to be at risk.

For the sake of the next generation …

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IDF = Israel Defense Force
LDL = low density lipoprotein
HDL = high density lipoprotein

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