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gOVERVIEW

PREFACE

Tobacco and CVD: Challenges and Opportunities

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Cardiovascular diseases (CVDs) are the leading causes of death and disability worldwide killing over 17 million people a year, with nearly 80% of these deaths occurring in low- and middle-income countries (LMIC) [1]. The mortality due to CVDs is projected to rise to 23.6 million by 2030 [2,3]. In developed countries, age-adjusted CVD death rates have declined in past decades as compared with a stark increase in developing countries [4]. Tobacco use is a major risk factor for CVDs and is responsible for 10% of associated global deaths [5]. As compared with non-smokers, smokers experience 2 to 4-fold increased risk of coronary heart disease (CHD) and cerebro-vascular stroke [6]. Smokeless tobacco (SLT) use has been shown to be associated with lipid abnormalities, hypertension, oxidative stress and glucose intolerance, all of which are associated with increased risk of CVDs [7]. Exposure to secondhand smoke (SHS) is associated with 25–30% increased risk of CHD among adults. A majority (over 85%) of the adult deaths due to exposure to SHS are due to CHD [1]. Unfortunately, increasing rates of tobacco use in developing countries are contributing significantly to the burden of death and disability from CVDs. Moreover, tobacco use impoverishes individuals and families due to diversion of resources to buy tobacco, increased health-care expenditure, and premature death due to CVDs and other tobacco-related diseases, which further burdens resources in poor developing countries [8].

TOBACCO: A LOW PRIORITY FOR CARDIOLOGISTS

Preventing CVD deaths caused by tobacco requires a comprehensive multi-sectoral approach engaging the health systems, community, and the policymakers. One of the most influential stakeholder groups for effective tobacco control policies, treatment, and prevention are health professionals such as cardiologists. Even though CVDs account for a major share of tobacco-related morbidity and mortality, cardiologists and their professional societies have lagged behind in the crusade against tobacco. This represents a missed opportunity to intervene among CVD patients and at-risk groups. Studies have shown that a structured course on tobacco control is rarely included in medical curriculum [1]. Such training among specialized health professionals, such as cardiologists, is important as they are seen as a credible source of vital information on the impact of tobacco use and secondhand smoke to their patients, public, and policymakers. Cardiologists also have the potential to advocate for strong and effective tobacco control policies as demonstrated by the active involvement of South American Cardiology Societies in defending Uruguay's strong tobacco control policies (such as the comprehensive smoke-free law) against attacks by the tobacco industry, which resulted in outcomes such as reduced hospitalizations for myocardial infarctions [1]. Thus, there is a need for continuing engagement of cardiologists to improve cardiovascular health through treatment of tobacco dependence, prevention, cessation, and support for effective tobacco control thus strengthening research on the health impact of tobacco use especially CVD impact of SLT use and bringing about a policy level change. Cardiologists need to highlight tobacco use as a major cause of CVD-related morbidity and mortality and actively support strong tobacco control measures at the clinical, public health, and policy levels [9].

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TOBACCO CONTROL AND CESSATION STRATEGIES

Efforts to control tobacco use should be both population and individual based. Tobacco use was once seen primarily as a problem of individual behavior, to be addressed at the individual level through interventions such as smoking cessation and health behavior programs but evidence now clearly points that population and policy level changes have a measurable influence on health outcomes. Population-level tobacco control interventions have the potential to benefit more disadvantaged segments of the society and thereby contribute to reducing health inequalities [10]. Beyond the direct impact of these types of population-level interventions, the resulting changes in social attitudes and norms towards tobacco use also affect overall tobacco use. For example, although smoke-free legislations are primarily aimed at protecting the nonsmokers, they also help decrease smoking prevalence and alter the societal norms such as acceptability to smoking in public places. The World Health Organization has identified a set of evidence-based "best buy" population-level interventions that are not only highly cost-effective but also feasible and appropriate to implement within the local constraints of the LMICs. These four key cost-effective policies include: tax increases on tobacco products, smoke-free indoor workplaces and public places, health information and warnings about tobacco, and bans on tobacco advertising and promotion [11].

Health professionals, such as cardiologists, need to be engaged as they have a major role in all settings–policy making, as well as clinical settings, thereby minimizing missed opportunities in tobacco cessation. Brief advice from physicians encourage patients to think about quitting and leads to quit attempts, thereby increasing the quit rate by a further 1–3% [12]. Physicians offering basic quit advice could prevent about 13% of myocardial infarctions and 19% of strokes [13]. In many countries smokeless tobacco is promoted as a safer alternative to smoking as a 'harm reduction' strategy. However, research studies now show that SLT use is associated with adverse cardiovascular effects, which needs further investigation.

ARTICLES IN THIS ISSUE OF *GLOBAL HEART*

The UN High Level Meeting on NCDs held in September 2011 recommended accelerated implementation of the Framework Convention on Tobacco Control (FCTC). Given the raised profile of tobacco control internationally, and the important role of cardiologists, this issue of *Global Heart* provides a timely update on the clinical, research, and policy perspectives of tobacco and cardiovascular disease. The issue contains a fascinating article on the history of tobacco use and a series of articles on the pathophysiological and clinical aspects of tobacco and cardiovascular disease. We know that smoking or exposure to SHS cause cardiovascular diseases. However, the mechanisms by which it occurs are not completely understood. "Pathophysiological mechanisms of tobacco-related CVD" reviews these mechanisms. The article first reviews the role of various components of tobacco smoke in cardiovascular disease including nicotine, carbon monoxide, and oxidant gases. It then goes on to describe the postulated pathophysiological pathways leading to the development of atherothrombosis. An article on metabolic and inflammatory pathways to CVD risk is also presented. "Tobacco cessation approaches and impact on CVD," analyzes the potential benefit of smoking cessation in CVD patients. The article also analyzes the impact of different cessation techniques including various psychosocial interventions and pharmacotherapy. Not only smoking, but also smokeless tobacco product use has been implicated to cause CVDs.

Children and infants are particularly vulnerable to SHS exposure as they cannot escape it, especially if their parents smoke in their presence. "Pediatric secondhand smoke exposure: systematic multilevel strategies to improve health," discusses integrated multi-level approaches for effectively reducing pediatric SHSe. This involves family-, healthcare provider-, community- and wider population-level interventions, while building linkages across levels of intervention to facilitate synergistic intervention effects.

We also present a series of articles on some important areas of tobacco and CVD research. "Smoke-free air: an important strategy to reduce heart attacks," highlights the substantial public health of smoke-free public places found in recent meta-analyses but reminds us that only 11% of the world's population are covered by comprehensive smoke-free legislation suggesting there is much work to do still. Another article provides a review of the current evidence on the role of mobile phones in smoking cessation. The article finds that emerging evidence suggests mobile phones could be a valuable tool for the

delivery of smoking cessation interventions in both low-and high-income settings, even to historically hard-to-reach groups due to high penetration of mobile phones across all socioeconomic groups. We also have two articles highlight both 'old' and 'new' threats from noncigarette tobacco use. The growing use of the waterpipe and e-cigarettes globally, highlights the need to adapt our surveillance tools to include non-cigarette tobacco use and develop evidence-based interventions to complement existing strategies, which are currently largely focused on cigarette use. The ongoing threat posed by bidi use, particularly in South Asia, underline the importance of effective advocacy to rapidly address the generally very low taxation levels on this product. The articles show that more high-quality epidemiological and policy relevant research on noncigarette forms of tobacco is an important priority.

We also present articles that focus on some of the key policy issues. "Death and taxes: epidemiological and economic evidence on smoking," discusses the need of raising taxes in LMICs to reduce tobacco use and associated CVD mortality. While per adult consumption of cigarettes has more than halved in the last three decades in the United States, United Kingdom (UK), Canada, France, and other high-income countries (HICs), male smoking has risen sharply in many LMICs such as China and Indonesia. Tax increase played a major role in reducing smoking in HICs. But, this greatly effective tool remains underutilized in LMICs. Authors suggest that tripling taxes on tobacco could rapidly raise cessation rates and deter smoking initiation, and could avoid premature deaths worldwide.

Not only smoking, but also exposure to SHS leads to significant cardiovascular morbidity and mortality. "Secondhand smoke and CVD in low- and middle-income countries, a case for action," analyzes SHS exposure (SHSe) in LMICs on the basis of Global Adult Tobacco Survey data from 14 LMICs. Data reveal high SHSe in LMICs, especially among women. The authors also conducted a systematic review of studies on SHS exposure and CVD risk in LMICs. Eight papers reported the association of SHS with ischemic heart disease and four reported the association of SHS with stroke. The article concludes with a definite case for action by governments in LMICs to implement smoke-free laws and protect their citizens from SHS-induced CVDs. "Global tobacco surveys: information for action by cardiologists," discusses the importance of timely surveillance on tobacco use and highlights the important contribution of surveys within the Global Tobacco Surveillance System, particularly the Global Adult Tobacco Survey (GATS) and the Global Youth Tobacco Survey (GYTS), have added to our understanding of the tobacco epidemic in low- and middle-income countries. The final two articles focus on adolescent smoking. "Health promotion for primordial prevention of tobacco use," discusses the range of interventions that may be effective in reducing adolescent smoking and another article by Pranay Lal and colleagues controversially calls for the legal age for tobacco purchase to be raised to 21 years in India.

In summary, we hope that this special issue provides an informative and comprehensive overview of the clinical, research, and policy aspects of tobacco use as related to cardiovascular disease. It is important that cardiologists respond to the challenges and opportunities presented by the tobacco epidemic to improve cardiovascular health of patients and communities through evidence-based clinical practice (by delivering cessation interventions), in research and by providing vital leadership and support for effective local, national, and international tobacco control policies.

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