

The Cardiologist - a Chained Prometheus

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Abstract

This critical review discusses the deviations from the Flexnerian hegemonic model of medical practice, carried out under the point of view of paleomedicine and relevant evidence from research. If we, on the one hand, have the required and sufficient knowledge on the burden of diseases that afflict mankind and its determinant factors, on the other hand the attention turns to strategies that do not have an effective impact on such diseases, consuming a larger portion of resources directed to healthcare: ischemic cardiovascular diseases, followed by type 2 diabetes mellitus. Their risk factors are well-known and have been shown to be controllable through health promotion actions, which constitute a process technology that is more cost-effective than biotechnology. However, we choose to apply large part of the financial resources on the care of the affected individual to the detriment of health promotion in the general population, who goes without this benefit, which characterizes an injustice in terms of healthcare actions.

*"Nothing in Biology makes sense,
except in the Light of Evolution."
Theodosius Dobzhansky*

As in the Greek mythology, in our time, the cardiologist personifies the mythical figure of *Prometheus*^{1*}. That, because having the necessary knowledge to effectively reduce the burden of cardiovascular diseases (CVD) that currently afflicts the population through health-promotion measures and primary prevention of diseases, cardiologists, chained to their *Caucasus* - represented by the hospital-centric curative model, with a negligible impact on the population health - is

^{1*} Prometheus was a Titan that created Mankind and stole fire from the Gods to give it to his creations. As punishment, he was chained to Mount Caucasus, where everyday an eagle, or a raven, would tear and eat his liver, which, due to the fact that Prometheus was immortal, grew back. Prometheus represents the human quest for knowledge; the capture of fire is the human audacity in search for this knowledge and his wish to share it.

Key words

Historical article; cardiovascular diseases; biotechnology; cost-benefit analysis.

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Manuscript received July 08, 2009; revised manuscript received October 06, 2009; accepted December 09, 2009.

thus prevented from offering a better cardiovascular health condition to the population.

CVD started to constitute the most important endemic diseases from the second half of the XX century on, accounting for the largest number of deaths worldwide, currently at a scale of one in three deaths and 6 times the number of deaths caused by HIV/AIDS¹. This situation tends to remain unaltered in the following decades throughout the world, including in developing countries². As for the morbidity, in Brazil CVD are responsible for the highest values of Disability Adjusted Life Years (DALY)³.

The "controllable" risk factors have been well determined, which account for 90% of the most significant form of CVD, the acute myocardial infarction (AMI), comprehending dyslipidemia, type 2 diabetes mellitus (DM-II), smoking, systemic arterial hypertension, excess weight with central distribution and anxiety/depression⁴. It is also well-known that three risk factors - smoking, inadequate diet and low levels of physical activity - contribute to the development of 4 important chronic diseases - CVD, DM-II, pulmonary diseases and several types of cancer - responsible for more than 50% of the deaths worldwide⁵.

The life habits considered hazardous to health, which appeared as an aftermath of industrialization and urbanization of a society that imported them, modifying old healthy habits, bring a concomitant increase to the prevalence rate of CVD risk factors, among them excess weight⁶.

The genetic pool, from which the individual genotypes of the modern human beings originated, changed very little since the *Homo sapiens* populated the planet, approximately 35,000 years ago, considered the last period of time during which the collective human genetic pool interacted with the typical bioenvironmental circumstances of those for which it was originally selected⁷.

By this pre-historical time, the "Thrifty Genotype" appeared, which was of vital importance for our pre-historical ancestors, who were basically hunters, and thus, very often went days without food. Hence, during times of abundance, they developed mechanisms that allowed the storage of energy as fat, which was consumed during the daily physical activities during hunting for the procurement of food and, even more significantly, during the frequent periods of food scarcity.

In the modern world, this genotype, which was previously very useful for the survival of the species, became disadvantageous, favoring a high prevalence of excess weight and its associated comorbidities (CVD and DM-II), then called "Genetic Homeostasis Dysfunction Syndromes". This incompatibility between our original formatting and the current environmental circumstances, which determines a

conflict between the “Stone-age genes” and the “Space-age environment”, leads to a rupture of complex ancestral homeostatic systems^{9,10}.

The rapid cultural alterations that occurred during the last 10,000 years were not accompanied by any possible genetic adaptations, specifically because many of these cultural alterations occurred after the Industrial Revolution, barely 200 years ago^{7,8}.

Hence came the proposal of the so-called “evolution-based prevention or “evolutionary-based health promotion, that is, an evolutionary approach for prevention Medicine which does not necessarily oppose the modern economic growth model and certainly does not go against the conquests of Medicine and public health⁸.

We are aware of the magnitude of the problem through the rates of morbimortality of the disease (CVD); we have already defined its main risk factors and indicators; effective strategies to fight the disease and successful experiences are available; however, paradoxically, we continue to prioritize the curative actions that contribute very little to the decrease the cardiovascular risk factors.

We remain, then, chained to the *Caucasus* by the fetters of a perverse model that prioritizes profit and the actions that keeps the assets flowing in the wheel of the *industry of disease*. The scarce resources destined to healthcare are spent mostly with the so-called “intensive” technologies (medications, equipment, diagnostic examinations and high-complex procedures), considered to be high-cost and that will benefit a small percentage of the population, to the detriment of a large percentage that would benefit from health-promotion and primary prevention technologies, considered to be more effective and lower-cost, consequently impaired by this deviation of resources, which is so appropriately called “opportunity cost”.

It has been extensively demonstrated that the elementary prevention (or health promotion)/primary prevention strategies have an incremental more favorable cost-effectiveness association than those called high-end care for advanced disease. Regarding the ischemic CVD, in developing countries, a cost of approximately \$ 25.00 to \$ 4,000.00 dollars is estimated for each disability adjusted life year prevented

(DALY) through the implementation of primary prevention strategies (health promotion). As for the cost of a treatment that includes myocardial revascularization associated with beta-blocker, aspirin, ACE inhibitors and statins (lovastatin), the cost increases to \$ 24,000.00 up to \$ 72,000.00 dollars for each DALY prevented⁹.

The resources spent with the prevention of CVD should not be seen as non-productive expenses, but as a truly productive investment, considering that most people who die due to these diseases do so exactly at the most productive age range.

Thus, physicians are chained to the mountain of profit, the victims of a *pharmacologization* and *technologization* of their relationship with their patients, a consequence a profit-based society that vilifies Medicine, very often turning it into a business masquerading as science and humanism.

It is therefore necessary to implement a broad public health program, disseminating the concepts on risk factors, as well as identifying and treating, as early as possible, individuals exposed to or who present cardiovascular risks that are higher than the ideal situation.

One must recall that in the last decade, the medical literature has accumulated evidence that the earlier such approach was started, the more effective it would be, that is, starting it with children and adolescents, who respond better and more quickly to disease prevention programs, particularly to health promotion ones, in addition to being great multipliers among the adult population inside the home.

Potential Conflict of Interest

No potential conflict of interest relevant to this article was reported.

Sources of Funding

There were no external funding sources for this study.

Study Association

This study is not associated with any post-graduation program.

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