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Cardio-metabolic problem in Egypt

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Abstract

Thirty years ago, chronic conditions such as diabetes, heart disease, and obesity accounted for less than 45% of the global disease burden. Today, they are the leading causes of death and disability worldwide, having surpassed infectious diseases such as HIV/AIDS and malaria. We have understood for decades the roles of 'classical' risk factors including elevated LDL-cholesterol, hypertension, elevated blood glucose, and smoking in the pathogenesis of cardiovascular disease. More recent research is continuing to define the contribution of other emerging factors to the risk of developing cardiovascular disease, particularly abdominal obesity that is associated with atherogenic dyslipidemia, insulin resistance, chronic inflammation, and prothrombotic state. All these factors constitute the global cardiometabolic risk that plays a significant role in development of cardiovascular disease.

Keywords Cardio-metabolic · Cardiovascular diseases · Insulin resistance

Introduction

Cardio-metabolic syndrome (CMS) is a combination of metabolic dysfunctions, mainly characterized by insulin resistance, impaired glucose tolerance, dyslipidemia, hypertension, and central adiposity [1].

Central obesity is considered a driving force for cardiovascular disease and diabetes mellitus. Excess intra-abdominal adiposity typically is accompanied by elevated levels of C-reactive protein and free fatty acids, as well as decreased levels of adiponectin leading to dyslipidemia, insulin resistance and inflammation, all lead to a great threat to the cardiovascular and metabolic health [2, 3].

According to WHO 2016 report on mortality, non-communicable diseases are estimated to account for 82% of all deaths in Egypt [4]. Cardiovascular disease mortality rates were the highest among NCDs, which is consistent with the previous reports as well as the overall picture in all Arab countries [5].

The most common cause of death in 2007 was Ischemic heart diseases and remains the commonest in 2017 with percentage increase of 35.9%. The second cause was

cerebrovascular stroke with percentage increase of 25.7% in 2017 compared to 2007, while diabetes mellitus jumped from eleventh position to sixth position with percentage increase of 51.6% (Fig. 1).

The same for premature death: Ischemic heart diseases remained the first cause of death with percentage increase of 33.5% in 2017 compared to 2007 and diabetes also jumped from tenth position in 2007 to ninth position in 2017 with percentage increase of 46.9% (Fig. 2).

It was found that diabetes mellitus became the third cause of disability in the year 2017 with percentage increase of 49.5% compared to 2007.

The risk factors driving death and disability combined are illustrated in Fig. 3 with dietary risks, hypertension, obesity, diabetes mellitus, smoking, malnutrition, and hypercholesterolemia are the top lists.

The problem of hypertension

According to data from the Egyptian National Hypertension Project (NHP) headed by Prof. Mohsen Ibarhim (between 1991 and 1993), hypertension affects 26.3% of adult Egyptians and more than 50% of individuals older than 60 years suffered from hypertension. The problem is complicated by the low awareness rates, only 38% of hypertensive Egyptians were aware of having high blood

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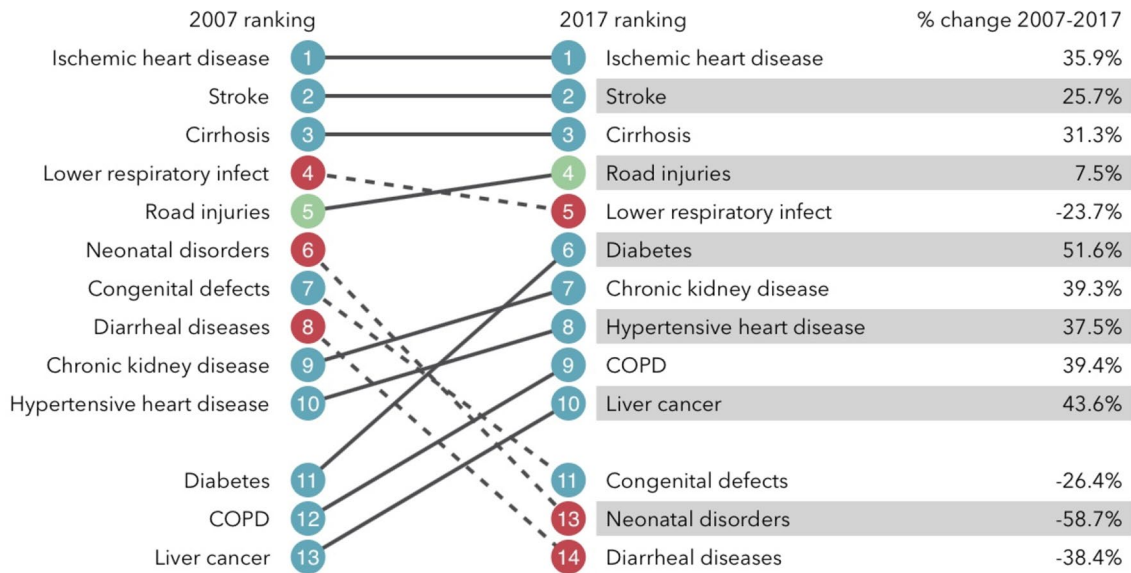


Fig. 1 Causes of death in Egypt on 2017 compared to 2007 (<https://www.healthdata.org/egypt>)

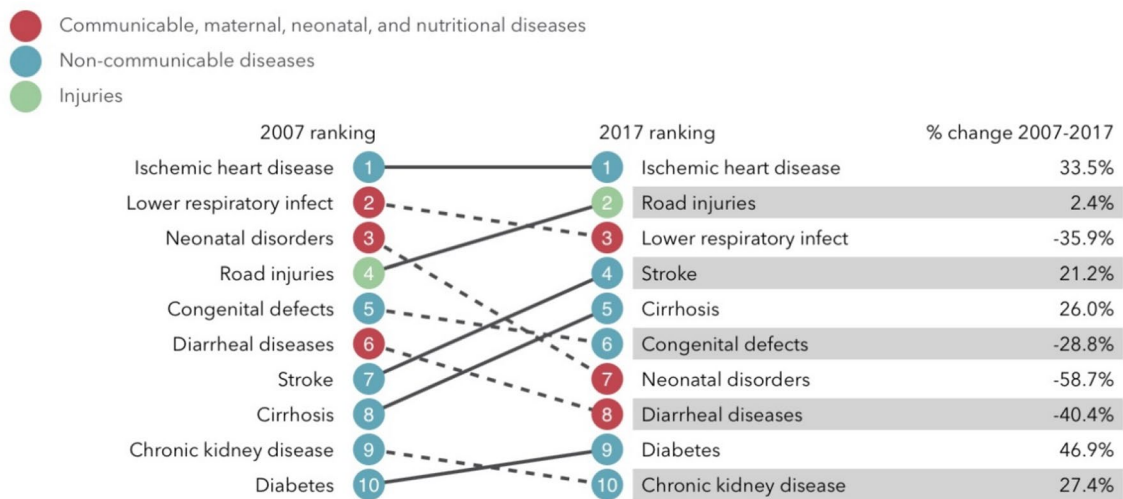


Fig. 2 Causes of premature death in Egypt on 2017 compared to 2007 (<https://www.healthdata.org/egypt>)

pressure, and only 24% were receiving treatment, whereas control rates (< 140/90 mmHg) were only 8% [6].

In more recent EHIS (Egyptian Health Issue Survey 2015), women seem to be more aware and better treated and controlled for their hypertension than men in our country [7]. Hypertension levels for both women and men increased steadily with age. Overall, nearly 1 in 3 women and around 1 in 4 men age 35–59 were hypertensive. More than half of women and more than 2 in 5 men in the 5–59 age groups were hypertensive, and 11% of women and 10% of men in this age group had a moderately or severely elevated blood pressure [7].

Twenty-two percent of individuals who were told that they had high blood pressure were eating a healthy diet to address the condition, and 11% said that they were controlling or losing weight. Slightly higher percentages of individuals who had had a heart attack or stroke were eating a healthy diet or trying to control or lose weight (30% and 14%, respectively). Comparatively few individuals who had high blood pressure or a heart attack or stroke were exercising in an effort to address their condition (2% and 6%, respectively) or had stopped smoking (1% and 5%, respectively) [7].

Other cardiovascular risk factors, such as hypercholesterolemia, increased LDL-cholesterol, low HDL-cholesterol,

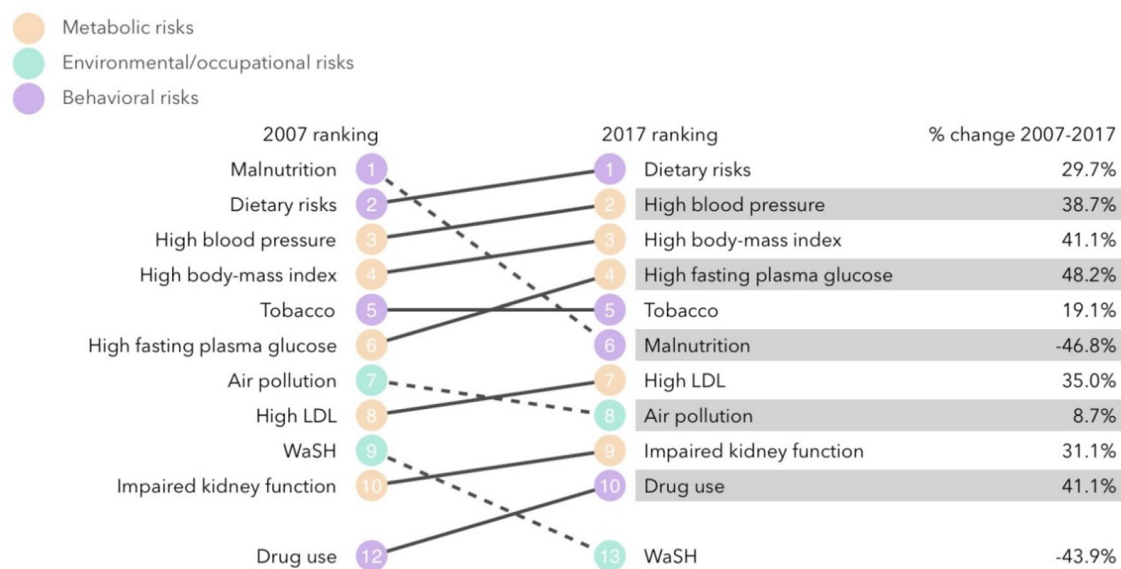


Fig. 3 The risk factors driving death and disability combined in Egypt (<https://www.healthdata.org/egypt>)

hypertriglyceridemia, diabetes mellitus, impaired glucose tolerance, and obesity, were present in 60% of hypertensive patients. Target organ damage was present in patients with more than stage I hypertension (BP160/100 mmHg) as ECG-LVH in 20%, coronary artery disease (CAD) in 16%, systolic heart failure in 5%, and renal failure in 3.2% [7].

A study was done by Mustafa and his colleagues in 2011; a cross-sectional study was conducted with a total of 1500 school adolescents from different preparatory and secondary schools in Alexandria city, Egypt. Hypertension was considered if BP was greater than the 95th percentile, and BP was staged to stage I (95th percentile to the 99th percentile plus 5 mmHg) and stage 2 (>99th percentile plus 5 mmHg). The study showed that there was a significant gradual increase in the prevalence of elevated blood pressure with the advancement of age of the adolescents. This prevalence increased from 4.8% in adolescents aged 13–14 years to 15.7% in adolescents 17 years of age and the study showed the association between the body composition measures and high blood pressure among school adolescents [8].

Diabetes and obesity

Egypt is the eighth country of the top ten countries of Diabetes prevalence with about 8.2 million and will project to be the sixth by the year 2045 with about 16.7 million persons will be diabetic [9].

An Egyptian health issue survey in 2015 showed increase trends in the percentage overweight or obese among women and men age 15–59 reaching over 70% in women and over 60% in men [7].

As expected, the relationship between age and BMI is marked. Among women, for example, the proportion overweight or obese increases from 42% in the 15–19 age group to more than 90% among women age 40 and older. Among men, the proportion overweight or obese is lower at every age than among women. Nevertheless, the majority of men age 25 and older are overweight or obese, and the proportion overweight or obese peaks at 79% among men age 50–54 years [7].

The proportions of overweight and obese tend to increase with the wealth quintile, with the differences between quintiles more evident among men than women [7].

In a study done in 2014 on the effect of the socioeconomic status (SES) on obesity in Cairo, no significant associations were found between most measures of SES and overweight/obesity in this population. Overweight and obesity are prevalent across the SES spectrum [10].

Tobacco smoking

Tobacco use data from the latest survey results at 31 December 2016 showed that 48.9% of males are currently smokers and 0.3% of females are currently smokers [11].

A study measuring the Magnitude of the Problem of CV risk factors among Egyptian University students done by Farrag and coworker in 2015 which was a cross-sectional observational study on 1838 students from ten public universities in ten Egyptian governorates that represent different geographic areas in Egypt. The majority of students were non-smokers, and the minority performed regular physical exercise. Obesity was encountered in 10.7% of participants,

while abdominal obesity was shown in 43.4%, 2% of students were shown to be hypertensive and 15% were pre-hypertensive. They concluded that pre-hypertension and obesity, particularly the abdominal type, were prevalent in Egyptian adolescents and young adults [12].

Dyslipidemia

The Non-Communicable Disease Surveillance Unit of the Egyptian Ministry of Health is a survey on 10,000 Egyptian person ranging in age from 15 to 65 years to evaluate magnitude of high cholesterol level in Egypt. The study extended for 12 months from 2005 to 2006. They found that serum cholesterol was high in 19.4% and being higher in females 23.1% than 15.7%, and this was attributed to the bad dietary habits, excess intake of fast food, low consumption of fruits, and vegetables in diet together with physical inactivity [13].

Also a cross-sectional study on 384 of Fayoum University students showed that the presence of high cholesterol in 38.8%, high TG in 29.7%, low HDL in 27.1%, and high LDL in 33.1%. A significant positive correlation was found with overweight, physical inactivity, abdominal obesity, consumption of fast food, and low fruits and vegetables in diet [14].

Another study was conducted on 150 patients with Acute Coronary Syndrome to assess the lipid profile and found that total cholesterol was high in 60.7%, LDL high in 58%, TG high in 63.3 and LP(a) high in 62%. TC/HDL and TG/HDL ratios were independent risk factors for ACS [15].

In 2018, Egypt embarked on a vast disease screening and treatment campaign for hepatitis C, hypertension, diabetes, and obesity, called the 100 Million Healthy Lives program.

Of a target population of 62.5 million, a total of 49,630,319 persons (79.4%) spontaneously participated in screening between October 1, 2018, and April 30, 2019. Most participants (66.3%) were younger than 45 years of age, and women out-numbered men in all age groups [16]. Twenty-one percent screened positive for hypertension; and about 5% screened positive for diabetes mellitus. Counseling is under way for the 40% of the screened population that is considered obese by WHO standards. Egypt has proven that universal screening for a range of diseases is not impossible. Drug-pricing challenges can be overcome. Treatments can be made available for all [17].

Compliance with ethical standards

Conflict of interest The authors declare that they no conflict of interest.

Statement of human and animal rights This article does not contain any studies with human participants or animals performed by any of the authors.

Informed consent For this type study informed consent is not required.

References

1. Srivastava AK (2012) Challenges in the treatment of cardiometabolic syndrome. *Indian J Pharmacol* 44(2):155–156
2. Boden G, Shulman GI (2002) Free fatty acids in obesity and type 2 diabetes: defining their role in the development of insulin resistance and beta-cell dysfunction. *Eur J Clin Invest* 32:14–23
3. Kershaw EE, Flier JS (2004) Adipose tissue as an endocrine organ. *J Clin Endocrinol Metabol* 89(6):2548–2556
4. World Health Organization Regional Office for Eastern Mediterranean (WHO/EMRO) (2015) Egypt health profile, WHO/EMRO. https://applications.emro.who.int/dsaf/EMROPUB_2016_EN_19264.pdf?ua=1&ua=1
5. Seattle WA (2010) Global burden of diseases, injuries, and risk factors study. Institute for Health Metrics and Evaluation
6. Ibrahim MM (2014) The Egyptian hypertension society, Egyptian hypertension guidelines. *The Egyptian society of cardiology. Egypt Heart J* 66:79–132
7. Egypt Health Issues Survey (2015)
8. Aboelfotouh MA, Sunny AI, Sallam A et al (2011) Prevalence of elevated blood pressure and association with obesity in Egyptian school adolescents. *Int J Hypertension* 952537:8. <https://doi.org/10.4061/2011/952537>
9. Cho NH, Shawb JE, Karuranga S, Huang Y et al (2011) IDF Diabetes Atlas: global estimates of diabetes prevalence for 2017 and projections for 2045. *Diabetes Res Clin Pract* 138:271–281
10. Mowafi M, Khadr Z, Kawachi I et al (2014) Socioeconomic status and obesity in Cairo, Egypt: a heavy burden for all. *J Epidemiol Global Health* 4:13–21
11. World health Organization (WHO) Report (2017)
12. Farrag A, El Eraky A, El Aroussy W et al (2015) Obesity and other cardiovascular risk factors in Egyptian University Students: magnitude of the problem. *Epidemiology* 5(1):1000181
13. Ellabany E, Nasser AM (2005–2006) WHO Eastern Mediterranean Regional Office. In: Collaboration with USAID. Cairo
14. Wafaa Y, Khalid K, Khamis S (2016) Prevalence of dyslipidemia among university students at Fayoum governate Egypt. *Ital J Public Health*. <https://doi.org/10.2427/11769>
15. Abelaziz A, Fawzy M (2014) Prevalence and pattern of dyslipidemia in ACS patients admitted to medical ICU. In: Zagazig University Hospital. Internal Medicine and Biochemical departments Zagazig University. *Z.U.M.J*, 20 (3)
16. Waked I, Esmat G, Elsharkawy A et al (2020) Screening and treatment program to eliminate hepatitis C in Egypt. *NEJM* 382:12
17. Haseltine WA (2020) Universal disease screening and treatment—the Egyptian example. *NEJM* 382:1

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