DIABESITY: WERE WE ARE WRONG AND WHAT IS THE COST?

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ABSTRACT

Obesity, metabolic syndrome, prediabetes and dislipidemia are the major risk factors for developing type 2 diabetes and possible severe complications which can decrease quality of life and increase population mortality.

Due to its epidemic characteristic and high costs of care, diabetes became a major health problem around the world.

It is compulsory to know epidemiological data and possible evolution of diabetes to ensure rational health policies among risk population.

Keywords: diabetes, obesity, globalization

Introduction

Diabetes mellitus is a disease mentioned since ancient times and many discoveries made over time have led nowadays to a continuous scientific progress based on clinical and therapeutical conduct targeting physiopathological mechanism (1).

The Ebers papyrus from 1559 B.C is the first written proof that mentions diabetes symptomatology by describing polyuria (2).

The literature data highlights an impressive dynamics of the increasing prevalence of the disease. Etu Seppala said that „diabetes mellitus exists to all nations, to all society levels, to the

poor and the rich, to blacks and whites, to the highly educated and uneducated, to religious and atheists, to famous politicians and unknown people, without shelter” (3).

In reality, statistical data exceeds those from literature claiming that for each diabetic patient there is one more undiagnosed. In 2017, International Diabetes Federation declared 425 million people with diabetes and a 48% estimated increase for 2045 (4).

The dramatic increase in number of cases with type 2 diabetes was considered a consequence of the high number in obesity prevalence leading to the use of new terms as „Diabesity” to emphasize the association

between this two diseases.

Thus, the reality of 21st century is governed by obesity being the main health disorder and major risk for type 2 diabetes (3). It is responsible for 80% of the cases with diabetes, 35% with ischemic cardiopathy and 55% with arterial hypertension (5).

All the increases lead to globalization phenomenon of diabetes with major impact on the costs of disease management and associated complications.

Type 2 Diabetes Mellitus

Is a chronic disease defined by chronic hyperglycaemia due to a relative insulin deficiency and associated insulinresistance. Secondary, it occur metabolism disorders of carbohydrates, proteins and lipids with major impact on the energy metabolism (1).

Over time, studies have shown that the clinical syndrome associated with insulinresistance and compensatory hyperinsulinemia are prediabetes, metabolic syndrome, obesity, dyslipidemia, primary arterial hypertension, atherosclerosis, polycystic ovary syndrome, non-alcoholic hepatic steatosis, sleep apnea syndrome and different types of cancers (colon, endometrium, pancreas, renal). It has also been identified to first degree relatives of type 2 diabetes patients (6,7,8).

According to UKPDS, insulin secretion deficiency precedes with 10 years the clinical onset of type 2 diabetes explainig why micro and macrovasculare complications are already present at 50% of patients (9).

Prediabetes represent and intermediate stage between normal glucose tolerance and diabetes. Also, the cardiovascular risk associated with diabetes has been sustained by many studies by demonstrating that progressive relation between hyperglycaemia and the disease starts at values far below cutt-off point. Another study has shown that the risk for acute myocardial infarction and cerebral stroke increases 15 years before diabetes diagnosis (10).

So, type 2 diabetes has become a cardiovascular disease due to micro and macroangiopathic disorders.

Obesity

In 2000, World Health Organization stated that is the first time in human history when obesity and overweight replaces the major health problems of the past century (11) as malnutrition or infectious disease and in 2002 said that „ Obesity is the one of the most obvious but neglected public health problem” (12,13).

So, at the end of 20th century, 60% of the american population was overweight and 26% obese (14).

Furthermore, the studies have revealed that obese adults represents a real risk for their own children. So, the child of an overweight adult has 40% risk to become also overweight and the number doubles in the case of both parents being a tipical example transfer risk for future generation (11,15).

More worrying is the fact that the global prevalence of child and yought overweight is 10%, 2% of them being obese (15).

The assumptions for 2020 are dark placing overweight to 77.6% and obesity to 40.2% for men and to 71.1% and 43.3% for female.

Along with increased prevalence figures, morbidity and mortality has reached alarming levels. Annually, in Europe, at least one death of 13 it is related to overweight. (16,17). So, obesity has become among the first causes of mortality that can be prevented (18).

There are many causes of this real pandemics and a major role has been played by environmental changes after 2nd World War on the background of individual genetic predisposition. Urbanization, modernization and industrialization were directly involved in obesity expansion and economic progress and rapid technology have led to a major decrease in daily physical activity (19).

Various studies have shown differences between members of the same ethnic group who lived in different environments proving that prevalence increases with migration to less traditional lifestyle (18). They also added a major change in diet by promoting food with high amount of lipids and simple carbohydrates (5).

For the last 200 years , it has been also a major change in the percentage of consumed

food principles, increasing from 10% to 13% for proteins and from 25 to 40% for lipids (21).

We know that overweight occurs in the context of under-energy consumption. The data shows that the number of „fast food” restaurants has tripled compared to 1972 and for each 10%, the number of obese people has increased with 9%. An American study revealed that only 38% of the food was eaten at home and the same percent never cooked a meal by using basic food (22).

Thus, the food consumption has been increased 18 times in comparison with 1970 because of eating outside healthy family environment from the perspective of self control caloric intake. (23).

A medium fast food portion has a caloric intake between 1000-2000 calories, the size increasing continuously. The classical hamburger has become 6 times bigger in 2003 compared to 1957, the caloric intake significantly increased from 210 to 680 kcal. A daily caloric ratio of a person with medium physical activity is provided by 3-4 hamburgers but it is important to mention that besides this there were consumed fries, beverages with high amount of sugar and dessert.

So, the considerable overdose of the daily calorific demand determines storage in adipose tissue and newly or increase of overweight (22,23).

Worrying is that 70% of the children between 6 and 8 year old prefers fast food and they think that is healthier. The average excess of at least 200 kcal per day leads to early obesity. Alarming is that children consume at school around 10-15% of calories from machines (23).

If in 1970, the caloric intake in USA was 3250 kcal/day, in 1998 it reached 3800 kcal/day and the consumption of sugar increased to 20%. All of this has been amplified by a variety of prepared and semi-prepared meals preferred by the majority of the families because it low price and lack of time for cooking at home. On a daily basis, 40% of the americans are eating at the restaurants (24).

Despite all this, the lack of movement is a cornerstone in creating the obesogenic environment. Once we had television, it has been an increase of obesity prevalence about 6% for each hour of viewing. A study from 2010,

has shown that the time used for watching TV increases the general, cardiovascular and through cancer mortality risk. Global risk approach revealed that 80% of total deaths are due to cardiovascular diseases in case of those who spent more than 4 hours in front of the television (23,24).

Also, walking has been replaced by car and each hour in it increases the risk of obesity by 6%. On the other hand, each kilometer walked daily decreases the probability of obesity with 5% (23).

Worrying is also the association between diabetes and pregnancy more and more often with major risk of perinatal morbidity and mortality (34). A possible increase in incidence could be because of the high number of overweight and obese moms and with the age >35 year old (2).

To all these, the role of the mass media is decisive conclusive by using daily obese messages (19).

In the same time, americans are spending 100 billions dollars on fast food restaurant in comparison with 6 billions in 1970 (25).

In 2002, USA declared costs for diabetes about 132 billion dollars. Afterwards, in 2007, the costs increased to 174 billion dollars with an estimate for 2020 of 192 billion dollars.

However, the 2012 assessments showed an increase in diabetes costs to 245 billion dollars, of which 176 billion (72%) were direct costs and 69 billion (28%) indirect costs. Direct costs were related to antidiabetic treatment (12%), treatment of complications (18%), hospitalizations (43%) and nursing services (8%). Indirect costs resulted from an increase in absenteeism (5 trillion) and declining work capacity (20.8 trillion), incapacity to work due to disease disabilities (21.6 trillion), and decreased productivity by increasing mortality (18.5 trillion) (26).

In 2015, diabetes-related health expenditures exceeded expectations by far at a rate of 12%, or 673 billion dollars globally (22).

To all this is added the costs allocated to obesity and associated diseases quantifying 7% of the health budget (25).

Conclusions

Knowing epidemiology data and evolutionary trends of diabetes is necessary to

ensure rational health policies for the population at high risk of developing this disease (1).

In this context, preventive measures are urgently required and the objective of a quantifiable risk factor would be essential in this initiative.

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