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Organ Shortage- A Health Social Crisis. Causes, Outcomes and Proposals

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ABSTRACT

The success, in medical action against diseases, plus the progress in the average life survival of the population, has conditioned a progressive increase of patients that have reached "end stage organ failure", the terminal phase of different organic systems indispensable for life.

In parallel, scientific advancement in research and medical engineering, has achieved a significant development of the substitution of vital organs, particularly through the systems of extracorporeal dialysis, and as well by the vertiginous advance of organ transplantation.

On the other hand, these positive alternative solutions of each individual case, have conditioned, a global and urgent social problem, the insufficient organ donation by the people. Concomitantly and significantly linked with this crisis of public health, the globally economic resources, and therefore the real possibilities of people's assistance by Social Security, have been seriously compromised, by the high cost of hemodialysis and as well, by the inexorably annual increase of patients requiring this solution to stay alive.

The most possible alternatives to solve this complex socio-economic crisis, which tends to unbalance the response of Social Security institutions to solve people needs, might stand on the prevention of terminal renal failure and as well on a deep and modern social education supporting the significant people's requirements of organ donation.

Today, these notions about preventive medicine and Social Security resources should be evaluated in relation to the treatment of end organ failure patients with artificial organs or organ transplantation.

A main possibility to improving this serious health and economic crisis, should be to establish by the States clear and well-defined health prevention policies and as well a more active and effective participation of medical professional and their representative institutions, in the worldwide development of health prevention programs.

Keywords

End organ failure, Organ donation, Organ shortage, Preventive medicine.

Introduction

From the 20th century, a constant and positive evolution of social economy was accompanied by positive and negative changes in the living conditions of the people. Advances in medicine and social security led to a constant progression of the average life of the population. On the other hand, the modifications and excesses in diets regimes, the persistent increase of various additions with serious consequences for health such as drugs, alcohol and tobacco were installed persistently and progressively mainly in societies with higher standard of living.

Paradoxically, these two alternatives have developed a new epidemiology of critical gravity, the inexorable "end organ failure". Non-communicable diseases such as hypertension, diabetes and chronic renal failure, which affect an increasing number of world populations, are mostly responsible for the almost uncontrollable increase of patients who require extracorporeal dialysis and/or kidney transplantation for its terminal state.

These two therapeutic options have generated new problems for the States and Society. On the one hand, the vital and permanent social problem of the insufficient people's response to organ donation and, on the other hand, the seriously progressive development of huge budgets exhausting the economic possibilities in the area of States health policy.

Rudolph Virchow has introduced the concept of Social Medicine: "Medicine is a social science whose politics is nothing more than medicine on grand scale". Concerning the physicians he mentioned "Physicians are the natural advocates of the poor and social problems fall, for the most part under their jurisdiction" [1]. Concerning these thoughts, I will like to add: "If the disease is a social evil, medicine must be a social good".

A most important success of current medicine is that organ transplantation has been being able to associate life and death for the benefit of society. Consequently, an important alternative in the evaluation of preventive medicine and social security actions should be to consider the current problems in the development of organ transplantation. Organ transplants symbolize the possibility of transforming death into life, because fundamentally someone's death is needed to make possible this scientific advance of our times.

The interpretation and understanding of the metaphor, "transform death into life", must be recognized by the State and mainly acknowledged by the people [2]. As well, it is important to point out to the people, that besides saving lives, organ transplantation generates economic resources to the nation's social security system, because of the significant costs differences between chronic hemodialysis and kidney transplantation [3].

Preventive medical care

A peremptory need for the improvement of social health has generated States conscious need to starting main actions to stimulate the development of experts in the area of preventive medicine and to promote the teaching of this specialty in the curricula of medical schools. The encouragement to facilitate in health institutions opportunities for a greater number of professionals in preventive medicine has been considered a priority. It is basic for education and health decision makers; to well define effective public health plans regarding preventive medicine to improve health and wellbeing of people, across the nations [4,5]. To develop skills to reduce the risks of disease, disability and death of population groups, preventive medicine physicians will be trained in both clinical and public health medicine. The main disciplines are biostatistics, epidemiology, health policy, administration and health behavior, and health environmental [6,7].

To recognize the significance of this public health problem, in 2002 specialists in preventive medicine represented only 0.8 percent of the physician's workforce, compared to 2.3 percent in 1970. The number of residents enrolled in preventive medicine training programs has decreased from 434 in 1996 to 348. As well, more than 95 percent of the curriculum time in medical schools is dedicated to diagnosis and clinical-surgical practice and less than 0.5 percent of teachers are trained in public health, preventive medicine or related sub topics [8].

In general, the significance of preventive medicine concerning critical social and economics health problems, has not fully considered by States health decision makers. This situation highlights the need for a programmatic revision of the public health plans, looking forward for a correct solution of this today serious medical flaw.

In this regard, recently it has been proposed implementation of a competency-based medical education approach in public health and epidemiology training of medical students to integrate the teaching of preventive medicine and related topics in the curriculum of the medical school [9-11].

Practice of preventive medicine take account the following medical actions:

- Primary prevention: Vaccines immunizations programs avoid transmission of infectious diseases, safeguarding life and as well, reducing specific health budgets [12].
- Secondary prevention: Early detection of still asymptomatic organic pathologies, already producing some reduction in normal organ function. This preventive action allows to discovering diseases, to control it development, and some time recovering a normal function of the affected system.

A simple example of the preventive medicine importance is the detection of lipid metabolism alterations in adults, by the high levels of blood cholesterol result in routine health checks. Identifying and controlling people with cardiovascular risk, acknowledged the essential needs of preventive medicine [13].

- Tertiary prevention: Preventive medicine at this stage acts against an already established disease. Tertiary prevention will basically try to limit the periods of hospitalization and improve patient's quality of life during the course of their illness [14].

Preventive medicine and hypertension epidemiology

The detection of hypertension in the general population, showed more than 24% of hypertensive patients: 33% of them ignore their disease; and only 25% treated with antihypertensive drugs have a controlled blood pressure. As well, hypertensive patients with good control of blood pressure, treated with antihypertensive drugs not blocking the renin-angiotensin system, showed an incidence of heart damage almost five times higher than normotensive individuals. Recent evidence showed that antihypertensive agents acting on the renin-angiotensin axis may provide cardiovascular system benefits [15,16].

Systematic hypertension prevention program trough public campaigns, accompanied by guidelines on the best therapeutic hypertension control, might constitute fundamental actions of preventive medicine against the epidemiology of hypertension.

Prevention of diabetes mellitus

Chronic hyperglycemia that persists even during fasting, defines a state of diabetes mellitus (DM). There are three main types of DM: Type 1, Is the consequence from body's failure to produce sufficient amounts of insulin, it is recognized as "insulin-dependent diabetes mellitus" (IDDM) or "juvenile diabetes". Type 2, This condition in which cells fail to respond properly to insulin is, termed "insulinresistance. This form is a described as "non-insulin-dependent diabetes mellitus or «adult-onset diabetes". A third main form occurring in pregnant women is the gestational diabetes [17-19].

In 2011, 366 million people word wide has been estimated to have non insulin dependent diabetes. Its prevalence is estimated to be almost doubled by 2030. Obesity goes hand in hand with T2 DM. Overweight people are at greater risk of developing T2DM than normal weight individuals [20].

Prevention is fundamental, through routine medical studies, to discover DM in the population, particularly in the obese people. Obesity is the main symptom of the "metabolic syndrome" (MetS), a major risk factor of T2DM and cardiovascular disease. Actually, overweight is a critical global problem with characteristics of an epidemic phenomenon. Preventive medicine is undoubtedly the basic element to challenge this increasing, but controllable global health risk [21,22].

Prevention of "end renal failure" crisis

Kidney disease progresses in stages, according to the modification of the glomerular filtration rate (GFR). The evolution to "end renal failure" it is usually produced in 5 stages:

- FGR ≥90 ml/min/1.73 m2, normal function, but proteinuria and hypertension might appear.
- FGR 60-89 ml/min/1.73 m2, function slightly reduced
- FGR 30-59 ml/min/1.73 m2 function greatly reduced.
- FGR 15-29, ml/min/1.73 m2 function extremely reduced
- FGR <15 ml/min/1.73 m2, end-stage renal failure. Dialysis/ Transplantation treatment should be started.

Stages duration might depend on the preventive medical action; first by the general practitioner, and particularly of the opportune consultation with the nephrologists. Early diagnosis, treatments and diet, might slow down the evolution of the pathology, in many cases for several years.

In patients with GFR between 60 and 89 ml/min /1.73 m2, the progression of the nephropathy in cases of hypertension and/or diabetes can be delayed with strict control of blood pressure, the blockade of the renin-angiotensin system and the limitation of proteins in the diet. Nevertheless, of its potential benefits, less than 20% of patients with serum creatinine ≥ 4 mg /dL (≥354 µmol/L) receive inhibitors of the conversion enzyme [23-25].

The new practical guides of the National Kidney Foundation in USA suggest: that chronic renal patient should begin his preparation for dialysis treatments, when GFR is between 15 and 29 mL/min /1.73 m2 [26]. A higher risk of patient's mortality that has not been referred to the nephrologists before dialysis therapy is documented [27].

Concerning the final state of renal failure, it is common to remark the inadequate medical monitoring in patients who initiate dialysis treatment. A recent study in patients who survived the first 2 months of dialysis treatment showed: between 61% and 73% had seen a nephrologists more than 4 months before the start of dialysis, 50% had no indication of diet control, only 37% had been warned to protect the forearm veins for the future HD, 50% did not receive vitamin D before the start of dialysis, 20% did not receive phosphate chelators before the initiation of dialysis, >60% had serum albumin levels below the lower limits admitted and only 30% received alpha epoetin [28,29].

With reference to the global importance of the uncontrolled increase in kidney diseases, in 2015 it was stated that 1.2 million deaths, 19 million disability-adjusted life, and 18 million years of life lost from cardiovascular diseases were directly attributable to "end stage renal failure". As well, in 2015, 1.2 million people died from kidney diseases, an increase of 32% since 2005. In 2010, 2.3-7.1 million people with end-stage kidney disease died without access to chronic dialysis. Overall, therefore, an estimated 5–10 million people die annually from kidney disease [30,31].

A systematic preventive medicine action should be required to reinforce health strategy and social education programs for early diagnosis and treatment of non- communicable diseases, main responsible of end stage renal failure. Kidney disease is highly prevalent, modifies the life course and has substantial financial implications.

Social Security and Social Transplantation

The progress obtained by transplant medicine is a reality and holds promise for the future of society. However, the persistent contradiction of "organ shortage" makes this potential benefit uncertain and often unreal.

A basic State objective, should be to make people understand that our body after death is the most suitable source for solving the inexorable evolution of kidney; heart, liver, lung, and intestine "end organ failure", responsible for the end of patient's life, and for growing of States health budgets.

This possibility is dependable of people's organ donation, mainly after dead or at the time of death of their loved ones; with also the alternative of organ donation in life following legal rules. Unfortunately, this people's option has remained for decades, in a partial response. The shocking result of this behavior, was the critical persistent "organ shortage" and the yearly "unfair death" of thousands of people [32].

We considered "unfair death", because society refuses to accept to offer to herself, the possibility of turning death into life. A chance for another human to live is denied by many of us, with numerous

opportunities for life, being lost in intensive care units on a daily basis. Prejudices or indifference prevent us from offering the chance of life from one human to another.

Several surveys have shown that most people are willing to donate their organs or those of a family member after death. However, when faced with the moment of grief, a high percentage of people fail to remember this commitment and the answer with regard to organ donation is negative.

The question that consequently requires a rational answer should be: What is the reason of this crime of "lesa majesty" that humanity is committing against itself?

There are a number of causes responsible of this people negative behavior to organ donation. Principally, we can mention: ignorance and disinformation [33-37]. What are the reasons for this behavioral change? As previously suggested, a possible solution to this crisis could be achieved if the right social and educational forces are put into play [35].

Organ donation is certainly a multi-faceted issue that affects potential donors, their families and society as a whole. A relative's refusal with regard to donation is the main impediment to organ donation. Several factors have been shown to worsen family consent rates:

1. Institutional responsibility of the organ procurement organizations:
   - requesting organ donation should be done after allowing the family to understand and accept the concept of brain death,
   - the interview with the family must be carried out by a specially trained professional [5,6];
2. Barriers to donation decision are not effectively evaluated in current global social education programs [38].

Global statistics show that in general, at the present time, approximately, 50% of the world's population shows a persistent negative behavior towards organ donation. As a critical consideration of this problem, during last years we have sustained that the current message to society has not been able to develop a positive change in this essential human behavior [38].

With this intention, we have proposed to modify the classic slogan "Donate is a gift of life" for "Donate is to share life among all". In addition, we have added to this suggestion the following ideas: "During life we are all potential recipients of a transplant. "Donors we will be fundamentally after death» "All monotheistic religions accept organ donation, both in life and after death".

Well-directed education and understanding, could justify that people accept the tacit conception of an acquired right for give or receive donation of organs and tissues during their lives". Conclusively, we suggest as a challenge for a social change, the catchphrase: "Our body after death is a unique and irreplaceable source of health".

It should be remarked that in our experience, as well as in some recent surveys, fear of death and mutilation were pointed out as the most significant and frequent barrier to donation [39-41].

It is significant to mention that at global levels current programs of education on organ donation have not deepened this problem and their potential solutions. Accordingly, with this remark, we suggest that to solve primitive barriers to organ donation, should be necessary a very conscientious program, developed by experts in education, theology and social psychology. Long periods of constant application of these programs to society, should be planned through all available means of communication of State's and international non-governmental organizations linked to health and education.

As well and primarily important looking forward to achieve, at long term, a change in society's feelings towards organ donation, the new educational programs must be mainly addressed to the young people, from primary school to all university students, principally at the medical sciences levels.

We believe that it is essential to change ancestral concepts, virtually unmoved, in the collective subconscious of humanity, from the ancient Egypt until now. Today's people's well-being and security, should also allow the possibility that everybody receive the necessary organ transplant at the time it was needed.

From the twentieth century, the progressive advances of social economics resources, was accompanied by negative and positive alternatives for the people; changes in diets, daily excesses of toxic for health as drugs, alcohol and tobacco, these risks, has go together with a progressive increase in the average survival of modern society. As a final consequence it has been developed a new epidemiological alternative the inexorable "end organ failure".

Non-communicable diseases such as hypertension, diabetes and chronic renal failure affecting an increasing number of the world population are significant responsible of the increase in patients requiring the alternative of extracorporeal dialysis and /or kidney transplant for their terminal state. These two therapeutic options have generated new problems for the States and the Society. On the one hand, the serious and permanent social problem representing by the insufficient people's response to organ donation, and on the other hand the seriously progressive development of huge budgets that exhaust possibilities of state's health policy.

A planned development of preventive medical actions looking forward for an early diagnosis and treatment of the pathologies primarily responsible for this critical situation and as well, a review of the social education programs regarding organ donation and transplantation are the most specific options searching for a solution to this serious crisis of global health.

States and/or private Social Security agencies should be actively involved in the solution of this social problem. Their participation in the development of correctly elaborated educational programs

will be extremely important in the primary efforts to be done, searching a change in the social conduct towards organ donation, essential for the safety and welfare for the society of the XXI Century.

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