

Cardiovascular Surgery Outcomes Opportunity to rediscuss medical and cardiological care in the Brazilian Public Health System

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The recent publication of the statistics of the Unified Health System Database (DATASUL) has shown that cardiovascular surgery outcomes in patients who underwent surgery at the Unified Health System (SUS) hospitals, from January 2000 to December 2003, may not be equivalent to those of United States and United Kingdom.

The mortality outcomes after cardiovascular surgery performed at SUS hospital in Brazil would be around 8%. These data were in comparison to those in the U.S. Society for Thoracic Surgeons (STS) database and to the UK Cardiac Surgical Register database which would be around 4%.

It is noteworthy to point out that these databases are voluntary representing the outcomes from reference hospitals in these countries which admit patients with better socioeconomic indexes and which make themselves ready to send the data spontaneously to these registers. STS database collects less than 10% of the data from overall surgeries performed in the U.S. annually. More suitable would be the comparison with more comprehensive databases involving Brazilian rationales.

When these data abovementioned are confronted with more comparable database, such as the European Public Health Services, they are divergent. Thus, while in the United Kingdom, the Cardiac Surgical Register shows mortality in myocardial revascularization (MR) surgery around 3%, in Spain this index raises to 7.3% [1].

SUS represents today more than 70% of the medical care in Brazil, with the private sector being responsible for the remaining medical care. The rising of these data is extremely propitious because it provides a space for opening of the discussion on all the medical and cardiologic care in the Brazilian public health system.

Human and organizational factors have a significant impact in determining the success of a medical treatment. These data must be interpreted beyond the individual competence.

The achievement of a complex medical treatment, which includes the cardiovascular surgery, is prospective only with an adequate organizational support. The outcomes surmount the operative aptitudes. Besides the technical competence, the success of a surgery depends on the disease evolutionary course when the patient is admitted to surgery. The type of heart disease, the appropriate case selections, accurate preoperative diagnosis, detailed surgery preparation, specialized anesthesia, adequate intensive postoperative care, indispensable and in good functioning state equipment, availability of skilled staff in all medical areas, laboratories capable of performing tests with rapidity and accuracy, competent blood bank to meet with great requirements, etc. Add to the aforementioned issues, a multidisciplinary team with adequate and fair wages and appropriate working conditions.

Mortality rate varies among hospitals and depends on the patient type and health service structure. Most of the cardiovascular surgeries are able of changing the evolving disease natural history, by reverting or improving the defects that are jeopardizing the patient's life, thus improving his/her symptoms, and his/her quality and quantity of life. How should the surgeons and the cardiac units react when the outcomes may not be the ideal ones and are questioned? Is the problem with the surgeons, with the health system or both?

The selection of cases is the first step towards the heart surgery success. The type of the patient and

his/her preoperative conditions are critical to determine the treatment success. All cardiac surgeries involve risk and some patients face greater risks than others depending on the severity of the disease. Notwithstanding, the greater the severity of the disease is, the greater the benefit provided by the cardiovascular surgery. Surgeons who accepted to operate more severe patients are going to have a higher mortality rate. Therefore, mortality data can be mistakenly interpreted without the knowledge of the surgeon's rationale or the institution casuistry. The use of risk scores enables the correction of the outcomes through the severity of the patients.

In Brazil, around 350 heart surgeries/1000000 inhabitant/year are performed, including defibrillators and pace-markers implants, one third of what is performed in United Kingdom and Europe, which perform more than 900 heart surgeries/1000000 inhabitant/year. In the U.S.A., 2000 heart surgeries/1000000 inhabitant/year are performed. In the UK register, mortality from emergency surgeries is twice of the elective surgeries; Furthermore, the emergency surgeries double twice the mortality risk.

SUS cares primarily for patients of a more disadvantageous socioeconomic status. The Federal Government allots to the Brazilian public health US\$ 157.00 that added to the private expenditures reach US\$ 290.00 per inhabitant/year (I/Y), i.e., 7.6% of the Gross National Product (GNP). This strongly contrasts with the public health expenditures of other countries. The U.S.A. spends US\$ 2,725.00 inhabitant/year (only with Medicare); in all, the amount reaches to the nonsense of US\$6,096.00 per inhabitant/year, i.e., 15.2% of the huge U.S.A. gross national product. Canada spends US\$ 2,823.00 what means 9.9% of the GNP. Germany spends US\$ 3,521.00; Portugal US\$ 1,850.00 even lower than countries like Argentina (US\$ 380.00) corresponding to 8.9% of the GNP, Chile (US\$ 720.00), and Costa Rica (US\$ 378.00).

Socioeconomic factors affect the treatment results of the cardiovascular diseases. In randomized controlled studies of the acute coronary syndrome (ACS) treatment which included patients from several countries, there has been an inverse correlation among Gross National Product (GNP) of the country, per capita income, and observed mortality. In these studies, patients with ACS treated in Brazil had comparatively greater mortality than patients treated in developed countries [2]. In the PURSUIT study, which evaluated the effect of adding eptifibatide to heparin and aspirin (acetylsalicylic acid) in patients with ACS without ST segment elevation, where patients of three continents were involved, the primary outcome of death and

myocardial infarction was twice in Latin American patients (Brazil included) when in comparison to those of North America (18.4% and 9.7%, respectively) [2,3].

Data from the Italy public health service are important. In the capital, Rome, myocardial revascularization surgery mortality rate in the same period was 5.4%. When mortality rate was divided by socioeconomic status (at the same hospitals), mortality rate in the group with higher socioeconomic status (economically more favored and more educated people) mortality rate was 4.8%. In the group with lower socioeconomic status (the poorer and less educated individuals) mortality rate was 8.2% [4].

Similarly, the comparison of cardiac surgery mortality in patients operated in Spanish public and private hospitals shows disagreeing outcomes. Thus, Permanyer et al. using data from four public hospitals and from four private centers have reported that the coronary surgery mortality rate was higher at the public hospitals (8.2%) than at the private ones (0.7%; $p < 0.001$). The patients' operative risks at public hospitals were higher, what explains in part the difference of outcomes [5]. The same findings were confirmed in the study by Pons et al., who also reported that mortality rate associated to heart surgery was higher at public than at private hospitals (11.7% vs 6.7%, respectively) [6]. Social factors, such as the educational level, were also taken into consideration regarding the outcomes differences.

In Brazil, the patients receiving medical attendance by the SUS correspond to the less privileged social class from the socioeconomic standpoint of the population. The per capita income in Brazil is US\$ 8,862.00 yearly; in the U.S.A., US\$ 43,444.00, and in the United Kingdom, US\$ 35,051.00. Nevertheless, the income distribution in Brazil is extremely disproportional, with 1% of the richest people – 1.7 million people – withholding an income equivalent to the portion composed of the poorest 50% (86.5 million people). One third of the Brazilian population (31.7%) was considered poor in 2003, i.e., 53.9 million people were living with a per capita income of half minimum wage. This portion of the population primarily represents the patient treated by SUS.

It must be added that the myocardial revascularization procedure cost is inferior to the fees supplied by SUS. Recent data from cost analysis supported by the Instituto Dante Pazzanese de Cardiologia show that the mean surgery cost was R\$ 6,990.00 and the real value paid was R\$ 5,551.41 [7], even considering that this institute belongs to and its employees are paid by the State Government, as well as it receives subsidies and equipment from the State

Health Secretariat. This unsteadiness in keeping the cost has caused university philanthropic hospitals, Santos Casas de Misericórdia, and even private hospitals with medical social security care to be forced to stop temporarily all medical care and are at risk to close down in as a consequence of the accumulated debt. These hospitals play a critical role in the care of the social security patient.

With the difficulty of access to primary health care in several Brazilian regions, witnessed by long waiting lines to receive medical care and for appointments and schedules, the patients with a heart condition who need surgery have a diagnosis made in a most severe, late phase of the disease. When such patients are admitted to surgery, they invariably are in an advanced state of the deterioration of the clinical condition.

In the U.S.A. and United Kingdom, the majority of the surgeries is composed by myocardial revascularization procedures (around 70%), with heart valve surgeries representing less than one fourth of the overall rationale (casuistry). In the patients undergoing surgery through SUS, these figures are different, with heart valve surgeries representing 33% of the surgical procedures. This is due to the high incidence of rheumatic disease complications, which are practically abolished in the first world countries. Rheumatic disease affects basically young patients of low socioeconomic class who need repeated surgical interventions which lead to a higher risk.

Cardiac surgery is largely mechanistic, performed by most of surgeons with an accurate and elaborated routine. The role of the surgeon is critical, technical competence is an absolute factor in settling the surgical success. However, in what extent is the surgeon responsible for the remaining success of the surgery at the hospitals of the public health system of the country? Surgeons are not and cannot be held responsible for the deficiencies in all stages of the process, for the clinical conditions the patient is admitted, for the hospital conditions, for the health professionals' work, such as physicians, nurses, and others, for the equipment, for the ICU conditions, etc. Nevertheless, the unfavorable surgical outcomes reflect immediately in the surgeon.

Risk scores allowing a more accurate analysis of the procedure quality are also being introduced and should help to identify specific risk factors as institutional and individual outcomes.

The education of the Brazilian cardiovascular surgery is among the best in the world. After six years of medical school, the surgeon has six more years of practice in medical residence (2 years of practicing in general surgery and four in cardiovascular surgery),

to be able to start practicing as specialty surgeon. Furthermore, Brazilian cardiology is recognized by its quality world-wide, specially due to the work developed by the Brazilian cardiovascular surgery. Few specialties in the country have contributed so much for the development of knowledge as the Brazilian cardiac surgery. So, in the field of myocardial revascularization surgery, grafting a section of the saphenous vein, the contributions which most improved the surgical outcomes in the world were introduced by Brazilian surgeons, such as myocardial revascularization techniques with a beating heart (known as off-pump coronary artery bypass graft) and the utilization of the internal thoracic artery double graft. In the surgical treatment of heart failure, the currently world-wide used techniques were developed by Brazilian cardiovascular surgeons. At present, all the research in these fields are driven by ideas developed from these pioneer studies.

Cardiovascular surgery, which demands high technology for its performance, has also another factor that makes it singular within the Brazilian context. With the concept conceived by the Brazilian cardiac surgery pioneers, it provided the development of an originally national industry to produce equipment for all surgical procedures. Thus, Brazil is self-sufficient in producing of practically all materials used, not depending on foreign materials. This was possible thanks to the view of the Brazilian cardiac surgery pioneers who intended to build a high technology Brazilian industry to produce its own equipment. Today, this Brazilian industry exports its equipments (coronary artery bypass graft sets, prostheses, artificial valves, etc) for several countries in all continents, with a world-wide recognized quality, saving our precious dollars and creating jobs. The scenario is more dramatic in the pediatric cardiac surgery in which the investments are far beyond the requirements. The shortage of specialized centers for treatment of the complex congenital heart disease, especially in relation to the neonatal period care. Today, less than one third of the basic needs of cardiac surgeries to correct the birth defects are performed.

Data published in RBCCV in 2004 show the huge care and financial deficit existing in pediatric cardiac surgery. While the need of surgeries is around 19,869, only 8,092 are performed, making up a deficit of 65% [8]. In the last Brazilian Congress of Cardiovascular Surgery, held in Florianópolis, in 2007, estimates based on the Brazilian Health Ministry data, point out that this scenario is not being altered because the mean cost/patient in a medium complexity hospital is of R\$ 11.886,06 and the SUS pays an average of R\$ 7.328,97.

When the hospital is of high complexity and, thus, admits more severely patients, especially neonates, the mean cost/patient is of R\$ 18.681,74 and the SUS pays an average of R\$ 8.501,23.

Thus, a review of the investments in medical fees, hospital services, orthoses and prostheses, funding, extension and/or modernization of the already accredited services, production subsidies from the Health Ministry to the Services should be urgently undertaken. However, the data from DATASUL and from the studies published are extremely relevant. Recognizing that the outcomes are dependent on a complex interaction between the technical skill of the surgical staff and the organizational aspects abovementioned, a conjoined technical approach of the issue can allow the diagnosis and the correction of a series of distortions that could be masked as a technical procedure. It is strengthened that the outcomes in health are dependent of structure and allocation of material and human resources.

Reflection and analysis can help to identify and to correct the missing points of the health framework in the country; to correct the route and to improve results. The medical societies and in special the Brazilian Society of Cardiovascular Surgery (BSCVS) are working together with the Health Ministry to achieve this purpose.

The publication of the Constitutional Amendment 29, approved in October 31 p.p., serves to organize the application of the minimum resources in the sector by the Federal, State, and Municipal Governments and to correct the deviations that were quite frequently previously. The medical societies have had a preponderant role in the regulation of the matter. Also, it is important to discuss the Congressional Bill from the Federal Government related to the State Foundation of Private Rights, a breakthrough alternative to the plastered direct and autonomous public administration, which can augment the efficiency and quality of the care delivered to the population.

Thus, all the Brazilian society needs to be mobilized in the struggle in order to the resources and investments for the delivery medical care, an indefeasible right of the citizen and due to the Brazilian Constitution, to be destined as determined. Surely, it will contribute for the improvement of the system with a better medical care and better outcomes in all health segments.

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