An adaptation of the Hungarian model: the Brazilian model

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Abstract: The Brazilian Society of Thoracic Surgery (BSTS) has the mission of improving patient care quality and thoracic surgery education. In order to achieve those goals, an overview of thoracic surgery activity in Brazil was necessary. BSTS had a clear need to start a national database. In 2015, BSTS joined European Society of Thoracic Surgeons (ESTS) Database platform. This partnership was a great choice not only for having a consolidated database, but also for allowing the development of shared educational and scientific projects. The strategy for BSTS database project was selecting committed group of surgeons, establishing implementation phases and setting milestones.

Keywords: General thoracic surgery; database; education

Introduction

Brazil is the largest country in Latin America both in terms of population and territory. Despite being the ninth largest world economy, the per capita income is quite low. As for healthcare assistance, most of the population relies upon the national health system, which is funded by the government and has an extremely heterogeneous quality across regions and providers. Around 24.5% of the population has access to private care that, although also heterogeneous, usually offers more resources (1). Regarding information on public healthcare quality, although the government has databases, the data is neither easily available nor specific. Therefore, it is very difficult to evaluate the outcomes of surgical procedures, particularly if we need risk-adjusted analysis.

The Brazilian Society of Thoracic Surgery (BSTS) was established in 1997 with the mission of improving patient care quality and thoracic surgery education. Currently, BSTS has more than 600 members. In order

to develop better educational and quality improvements projects, the BSTS board needs information about the outcomes of thoracic surgery procedures performed in Brazil. Until recently, the board had to rely upon the very limited amount of data provided by the governmental databases (2). The board needed to know what type of lung resection was done across the country (thoracotomy, video-assisted, robotic-assisted), what type of pathologies (benign or malignant) and outcomes (morbidity and mortality); and, it became clear that it would be very difficult to answer those questions without a dedicated database.

The European Society of Thoracic Surgeons (ESTS) and the Society of Thoracic Surgeons (STS) have dedicated databases and have already proven their importance (3-7). ESTS reports provide an overview of thoracic surgery activity in Europe and performance benchmarks. In addition, it's a resource for research analysis and healthcare improvement. As examples, Falcoz *et al.* showed mortality and morbidity reduction for video-assisted lung

cancer lobectomy (8); Brunelli *et al.* developed European risk models for morbidity (EuroLung1) and mortality (EuroLung2) to predict outcome following anatomic lung resections (9); Ruffini *et al.* evaluated prognostic factors for thymic malignancies and demonstrated that incomplete resection and non-thymoma histology had a significant impact in increasing recurrence rate and in worsening survival (10).

The STS Database also provides participants risk-adjusted performance reports that allow comparison of institutional outcomes against national benchmarks. Those comparisons lead to continuous quality improvement as mentioned by Seder *et al.* in their manuscript (11). Risk models for lung resection and esophagectomy for cancer were developed and have been continuously updated. In addition, composite quality measures for lobectomy and esophagectomy were proposed (12). STS General Thoracic Database participants were then categorized as 1-, 2-, or 3-star programs based on their lower-than-expected, expected, or a higher-than-expected composite score, respectively (13). This piece of information is an important tool for quality improvement and can be used in administrative or insurance negotiation.

Based on the examples above, the BSTS board decided that a Brazilian Database was necessary, both for quality-of-care evaluation and research purposes. It should address questions related to all thoracic surgery procedures as demographic features, technical details and outcomes as complications and surgical mortality.

Strategic planning

The first step we took to make the BSTS Database project a reality was the selection of a committed group of people. These key people ought to have academic background, interest in databases, high surgical volume, and work in a well-organized institution. We were aware that, during database implementation, difficulties would demand time and effort. Therefore, we believed mid-career thoracic surgeons, with their senior staff endorsement, would have the appropriate profile. This group would later constitute the BSTS Database committee.

The next step was the decision between creating our own database platform or using an already well established one. If we created our own, it would demand time to develop, test and effectively implement it, not mentioning infrastructure costs. If we decided to partner with another

society, it would be either ESTS or STS because of their databases. Positive points of this last option included using the same terminology and consequently having comparable data. A downside would be acceptance of working with non-customized dataset; consequently, the addition of specific questions would depend of their committee approval. The proximity with ESTS and its multinational composition were important factors for the final decision to join the European Database.

After having the right people on-board and the online platform ready for use, we established milestones for guidance and motivation. By starting with a smaller group, it was easier to identify and solve difficulties. In addition, tasks and goals not only reinforced responsibilities but also showed the members the purposes of the database (BSTS surgeries performance).

Implementation process

Phase I: translation of dataset, piloting data input and abstract presentation at ESTS 24th meeting at Naples. The translation was important to reach all surgeons and database managers; then language wouldn't be an issue to join. K-Data gave all the support needed to add those changes. The pilot phase included the participation of 5 institutions. We had regular web conferences to share difficulties and questions. Each institution developed a data input system: dedicated nurse or junior attendee. Then, a timeline was set for data input to work in the ESTS meeting abstract.

Phase II: addition of more institutions and abstracts presentation at our National BSTS meeting. First, institutions were invited to send their own lung major resections dataset in a timeframe. Then, the ones achieving that task were eligible to join the database. The committee was responsible to send abstracts to the BSTS meeting. Another important achievement in this phase was funding, a critical step for the database long-term maintenance. BSTS applied for and was awarded a research grant offered by Johnson&Johnson. That was important to keep participation free, encouraging voluntary engagement.

Phase III: extend the participation to all Brazilian thoracic surgeons and develop a specific trachea dataset. BSTS-ESTS Database project was presented to all members during our national society meeting, clarifying the purposes and milestones. The abstracts were important to reinforce the need, stimulate and to invite all members to collaborate. We mentioned our collaborative work as a society, which

included presentations about propensity score matching comparing video-assisted and open thoracotomy for anatomical lung resection morbidity and mortality and the performance of Brazilian thoracic surgery units contributing to the BSTS Database using the EuroLung 1 and 2 models as benchmarking tools (14) (24th and 25th European Conference on General Thoracic Surgery, 17th World Conference on Lung Cancer). Those examples positively stimulated more surgeons to engage in the BSTS Database project. Considering our country high volume of trachea procedures (benign and malignant), we identified the need of a dedicated dataset. Therefore, we developed the tracheal diseases dataset and presented to ESTS committee.

Phase IV: one of the main purposes of this phase not implemented yet, is the inclusion of Latin American centers. We believe Brazil has similar settings regarding resources and patients as others Latin American countries. Indeed, as the largest Latin country in the continent we could be the reference for the others and share our experience in the implementation of the database.

Future directions

BSTS must consolidate the database. For this phase, a permanent committee has been established with the purpose to define participation rules and periodically evaluate cases completeness and warn institutions under "minimum level". After 3 years keeping records consistently below completeness level, the institution will be invited to withdraw the BSTS Database. For surgery quality analysis, we plan to discuss among members the implementation of an accreditation process related to the database performance—like ESTS's. Positive point is unquestionable quality improvement as shown by the ESTS and STS; however, in the other hand, it might inhibit participants. After approval and more units engaging in the database we will have a larger amount of procedures to start institution performance evaluation. Another benefit of BSTS Database participation is data for research projects. Local data can be immediately downloaded, and national projects will go under committee evaluation.

Airways Surgery International (AIR) Database

Airway complications after endotracheal intubation and tracheostomy are still common in Brazil. Despite advances in intensive care unit (ICU) care in the last decades,

especially in the capitals, disparities among the nation are still a major issue (15,16). Thus, an increasing number of individuals with tracheal diseases are seen in outpatient clinics and emergency rooms. Most of them have benign tracheal stenosis, but other rare diseases such as benign tracheoesophageal fistulas are also seen (17-19). The experience of Brazilian units with such diseases has been published, and most thoracic surgeons from Brazil deal with tracheal diseases on a regular basis (15-19). Nevertheless, scientific evidence in this area of thoracic surgery is still scarce and relies mainly on retrospective single-center studies (15-19).

In 2016, at the 24th European Conference on General Thoracic Surgery, held in Naples, during the ESTS Database Committee meeting it was considered desirable the introduction of a specific ESTS Database section dedicated to data collection on airways surgery. Later that year, members of BSTS and ESTS started a cooperation for the development of the future AIR Registry. The project began at the Heart Institute (InCor) of the University of São Paulo, included 4 other centers from Brazil. The Brazilian version of the airways database was built in the RedCap platform and encompasses surgical and therapeutic procedures in the larynx, trachea and bronchi. This first registry was delivered in early 2017 and immediately tested by five Brazilian centers. Later on, in February, during a visit to São Paulo, the project was presented to Prof. Walter Klepetko, from the Medical University of Vienna. He appreciated the work, and soon he joined the project boosting the creation of this international registry in airway diseases. Unlike the Brazilian version of the database, the AIR would include only adult patients that were submitted to tracheal, laryngo-tracheal or carinal resections. Endoscopic procedures would not be included.

During the 2017 ESTS annual meeting in Innsbruck, the core team working to the AIR project held an unofficial meeting, where it was decided to migrate from RedCap to the KData platform in order to develop a registry that was in line with the ESTS Database. Furthermore, a limited number of European and Brazilian thoracic surgery units were identified for testing the AIR final version using the new ESTS Database platform.

In January 2018, the ESTS Laryngotracheal Database was officially announced by the ESTS as an international registry, co-chaired by Brazil and Europe. It was formally presented during the symposium "Management of Laryngotracheal Problems III", held in Vienna in March 2018. Currently, final arrangements are still underway with

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the KData platform. Once the AIR is ready, a trial period of 12 months will ensue, with selected Brazilian and European Units. This testing period should end in late 2019. After that, the AIR will be launched to the entire ESTS and BSTS membership.

Conclusions

Brazilian Society of Thoracic Surgery had a clear need to start a national database to have an overview and quality of thoracic surgery procedures performed in Brazil. Alternatives were either having a personal database or using a well-established one. After evaluating pros and cons, BSTS joined ESTS Database platform to ensure the data would be comparable. A committee was created based on personal profile. Milestones were established and were important during BSTS Database implementation phase. Dataset translation made the input easier. Abstracts presentations were an attractive to make surgeons more interested in the participation and contribution of the database. Perspectives include a committee that will manage participants admission, evaluate quality completeness and research projects and audit quality of care.

Recently, the AIR further consolidated the partnership between BSTS-ESTS. The project was built initially in the BSTS, by Brazilian surgeons, and then improved by ESTS members and implemented as an official ESTS satellite database. We believe that a co-chaired project will give birth to a true international cooperation and shed light in an area of thoracic surgery that is in great need for good quality evidence-based data.

In conclusion, database is very important in for the thoracic surgery quality improvement and patient safety as consolidated by Europe and North America societies, it is feasible, and planning is mandatory before its implementation.

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Footnote

Conflicts of Interest: Ricardo M. Terra is a member of Johnson&Johnson's advisory board and he is involved in educational activities promoted by Medtronic and H.Strattner/Intuitive. Other authors have no conflicts of interest to declare.

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