

Echocardiography Services: An Overview

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Abstract

Introduction: Due to an increasing growth in the number of echocardiographers in Brazil, as well as in echocardiography services, it has become paramount understanding the status quo of this practice in our country.

Objective: Perceive an accurate profile of echocardiographic services offered in Brazil.

Methods: A survey was carried out through the Internet with members from the Department of Cardiovascular Imaging. They answered specific questions about infrastructure, services provided, number of tests, training and professional qualification.

Results: Among the 429 participating centers, only those that answered the whole questionnaire were taken into account (n = 157). Of these 157 centers, 55 offer specialized training in echocardiography, and most of them is located in the Brazilian southeastern region. It was observed that 146 services (93%) have at least one professional certified in echocardiography by the Department of Cardiovascular Imaging of the Brazilian Society of Cardiology.

Conclusion: Most echocardiography centers in Brazil have professionals qualified and trained to perform the method. (Arq Bras Cardiol: Imagem cardiovasc. 2015;28(2):67-72)

Keywords: Echocardiography/methods; Echocardiography/statistics & numerical data; Echocardiography Transesophageal; Diagnostic Imaging/trends.

Introduction

Echocardiography is a method well established nowadays in supporting the diagnosis of several diseases.¹ Many modalities developed over the years were added to the transthoracic echocardiography, such as transesophageal, pharmacological and physical stress, three-dimensional and strain imaging modalities. Such development required from echocardiographers continuous update about the resources in use, as well as from echocardiography laboratories, that had to start providing these modalities to an increasingly demanding market. A quality service with highly trained professionals became necessary to address such demand. In fact, this is a global trend already supported by guidelines²⁻⁵ and by institutions that certify the quality of echocardiography laboratories, such as the Intersocietal Accreditation Commission⁶.

In Brazil, during the Echocardiography Symposium held in Recife, Pernambuco, in 1980, the idea of creating an echocardiography department in the Brazilian Society of Cardiology was suggested. The goal was achieved

and eight years later, the first board of the Department of Echocardiography was elected, followed by the first Brazilian congress in the area, held in 1989. Due to the increasing number of echocardiographers in the country, it became necessary to establish standards for the practice of such diagnosis method in order to ensure effective training in the subjects, and therefore, appropriate professional assistance. The first qualification exam was held in 1991 and since then, it has gradually become increasingly professionalized. Today there are 1,673 physicians certified in echocardiography in Brazil. The natural demand for highly qualified professionals also grows and follows this trend, in order to ensure excellence in the practice of echocardiography in our country.

Objective

Observe the characteristics of echocardiographic services in Brazil, outlining a profile of services provided.

Material

Research carried out

From January to February 2013, a letter of invitation to participate in an on-line survey was sent to 1,987 members of the Department of Cardiovascular Imaging of the Brazilian Society of Cardiology (DIC-SBC), by email and by mail, in order to outline a profile of echocardiographic centers in Brazil, aiming to set up an assistance plan to

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these services based on actions for their improvement and qualification. The answers were entered into an electronic form on DIC-SBC website. The questionnaire is shown in Figure 1. Only fully filled out forms were considered. The questionnaire consisted of questions related to demographic data, number of examinations and qualified physicians, equipment used, professional, academic and training qualifications. According to the monthly number of echocardiograms performed, the size of services were classified into five levels: small (up to 100 tests), small to medium (100-300 tests), medium (300-600 tests), medium to large (600- 1,000 tests) and large (more than 1,000 tests).

Results

Questionnaire answers

A total of 429 services participated in the survey, of which 157 completely filled out the form, thus being selected for the study. The centers were distributed according to the Brazilian state, and can be found in Figure 2. Among them, 55 (35%) offer internship in echocardiography training. In 3 (5.4%) services only the internship lasted less than one year (minimum time required to get a certification). The data is on Table 1. The results in Table 2 refer to the size of echocardiography laboratories.

As for the treatment itself, 141 (89.8%) services offer treatment in the pediatric area. Examining the modalities within echocardiography, 52 services do not provide pharmacologic stress echocardiography, and only 49 provide physical stress echocardiography. As for transesophageal echocardiography, 121 services offer this test, and 40.5% perform less than 25 tests per month. Thirty-nine (24.8%) provide three-dimensional echocardiography. In addition, 146 centers (93%) had at least one qualified echocardiographer by the Department of Cardiovascular Imaging. Of these services, 89 had 1 to 3 qualified physicians; 27 had 4 to 6; 18 had 7 to 10; and 12 had more than ten echocardiographers.

Training Centers in Echocardiography

We noticed that the state of São Paulo has the largest number of training centers with 21 services (38%) of the 55 that provide internship in echocardiography training, followed by Rio de Janeiro and Minas Gerais, each one with 8 centers. Figure 3 shows the national distribution of services offering echocardiography training course. Of these, 5 do not have training in pediatric echocardiography; 3 do not provide training in pharmacologic stress; and 30 either have physical stress echocardiography. The three-dimensional modality is offered in 29 services. Of the 52 services with internship/residency in echocardiography, in which students may be subject to an exam to obtain the certification in echocardiography, the vast majority (56.4%) undertakes the 1-year course (minimum time required to take the qualification exam). In 21 centers (38.2%), the duration of this course is of two years.

Discussion

The gradual increase in the number of echocardiographers in Brazil is notorious in the last 20 years, as well as the resultant boost in the number of echocardiography training centers and healthcare services. However, we observed in our study that there is a regional discrepancy in the number of services according to the Brazilian region: for example, more than half of the country's echocardiography laboratories are concentrated in the Southeast, probably due to the high population density of the region. According to the classification of service size, we found that 53% are located in medium and small to medium sizes classification. As this classification was proposed only according to a survey question that did not take into account the exact number of tests, there is room for discussion of a possible change and inclusion of other parameters, such as number of professionals and equipment. We have noticed great concern of DIC about the practice of the method with regard to the quality of tests, due to the undeniable importance of the method in supporting clinical decisions, particularly in the field of cardiology. This can steer the creation of service quality guidelines similar to those described, i.e. by the American Society of Echocardiography³ and the European Association of Echocardiography⁴.

By outlining a profile of these services in Brazil, we noticed that there is today a concern about the quality of professional training. We observed that the vast majority (93%) has at least one professional certified in echocardiography.

With respect to centers that provide internship or residency in echocardiography, a very relevant figure is that in the vast majority (94.6%), the training time is compliant with the rules required for obtaining, through a special exam, the certification in echocardiography, which demonstrates carefulness in training professionals in the echocardiographic method. However, it is intriguing that many of these services do not have modalities, such as pediatric, stress, transesophageal and three-dimensional, whose knowledge is required in the certification exam. An issue to be considered and discussed would be the future certification of these training centers, even offering a "bonus" to physicians trained in echocardiography at the certification exam according to the quality of training, including as quality parameters: humanized care to the patient and staff, bioethics, facilities of exam rooms, infrastructure for devices and data filing, clinical meetings, staff qualification, scientific productivity, among others.

Limitations

As the survey was carried out on-line, we must bear in mind that due to spontaneous answers, many centers did not take part in it. This might not offer actual information on the distribution of services. Another fact that we must take into account is that we used only fully answered

SURVEY ON ECHOCARDIOGRAPHY CENTERS IN BRAZIL
DEPARTAMENT OF CARDIOVASCULAR IMAGING – BRAZILIAN SOCIETY OF CARDIOLOGY

- 1- Name of institution
- 2- Name of coordinator
- 3- Full address
- 4- Phone number
- 5- Email
- 6- What is the total number of echocardiograms performed on a monthly basis?
100 100-300 300-600 600-1000 >1000
- 7- What is the number of adult transthoracic echocardiograms performed on a monthly basis?
100 100-300 300-600 600-1000 >1000 Not performed
- 8- What is the number of pediatric transthoracic echocardiograms performed on a monthly basis?
100 100-300 300-600 600-1000 >1000 Not performed
- 9- What is the number of pharmacologic stress echocardiograms performed on a monthly basis?
 <25 25-50 50-100 100-150 150-200 >200 Not performed
- 10- What is the number of physical stress echocardiograms performed on a monthly basis?
 <25 25-50 50-75 75-100 >100 Not performed
- 11- What is the number of transesophageal echocardiograms performed on a monthly basis?
 <25 25-50 50-100 100-150 150-200 >200 Not performed
- 12- What is the number of intraoperative echocardiograms performed on a monthly basis?
 <5 5-10 10-30 30-50 >50 Not performed
- 13- What is the number of Vascular Doppler performed on a monthly basis?
 <50 50-100 100-300 300-500 >500 Not performed
- 14- How many echocardiography machines the service has?
1-3 4-6 7-10 >10
- 15- Do you have equipment with software for which categories below (choose more than one option if applicable)?
Tissue Doppler Strain/Strain rate Adult three-dimensional Children three-dimensional
Transesophageal Three Dimensional None
- 16- Select the equipment brands.
Esaoite GE HP Philips Siemens Toshiba Others
- 17- Specify the equipment models.
- 18- How many echocardiographers work in the service?
1-3 4-6 7-10 >10
- 19- How many echocardiographers are certified?
1-3 4-6 7-10 >10 None
- 20- How many echocardiographers hold Master's and/or PhD degree?
1-3 4-6 7-10 >10 None
- 21- Does the service have internship/residency program in echocardiography?
Yes No
- 22- If you answered YES to question 21, how many interns/residents per year?
1-3 4-6 7-10 >10
- 23- If you answered YES to question 21, what is the duration of the training?
Less than 1 year 1 year 2 years 3 years
- 24- If you answered YES to question 21, what is the year hour load?
 <500 hours 500-1000 hours 1000-1500 hours 1500-2000 hours >2000 hours
- 25- Does the institution offer a graduate program?
Yes No
- 26- Does the institution offer theoretical and practical activities, such as clinical case discussions, lectures, debate of manuscripts?
Yes No
- 27- If you answered YES to question 26, how many times a month?
1-3 4-6 7-10 >10

Figure 1 – Questions of the questionnaire used for the survey.

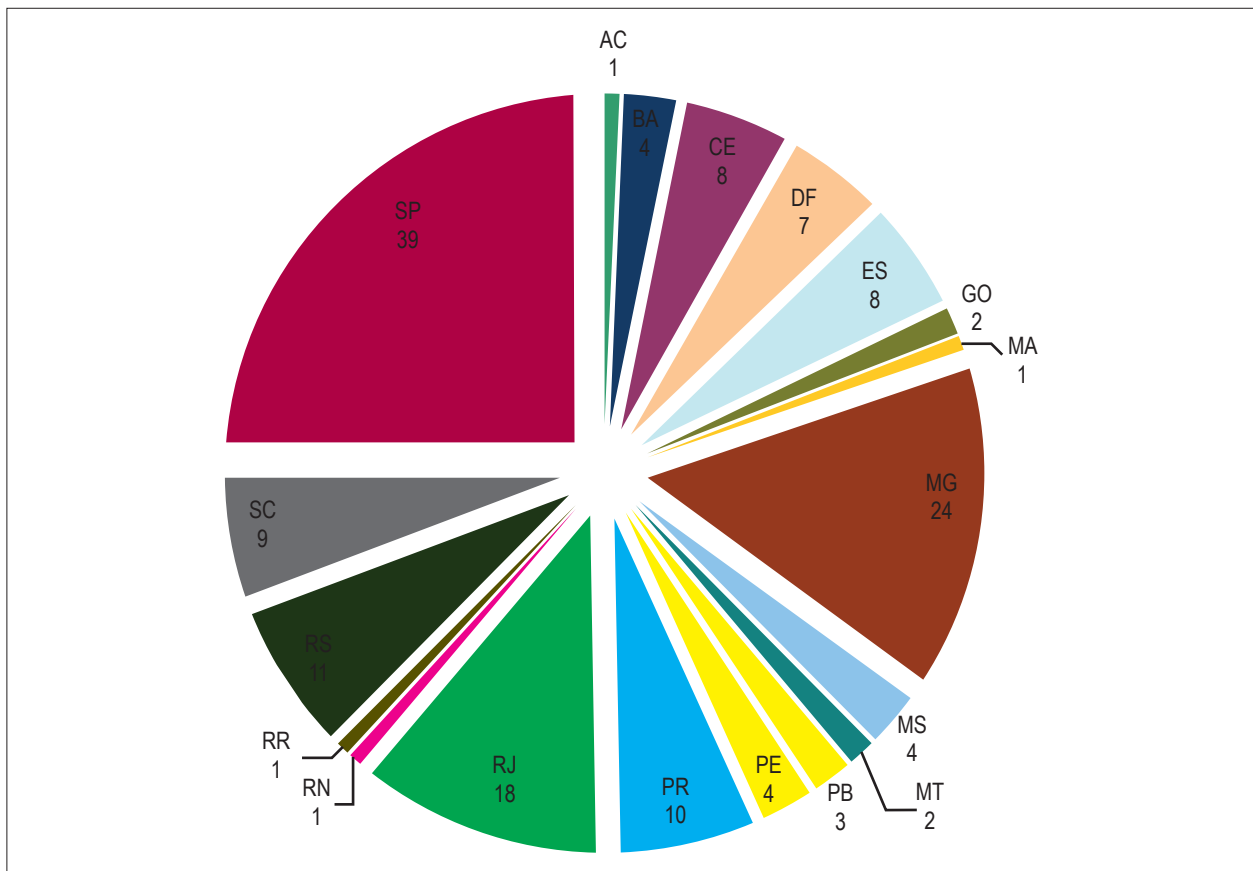


Figure 2 – Distribution by federal unit of echocardiography laboratories in Brazil that fully answered the survey.

Table 1 – Number of echocardiography training centers according to the duration of the internship/residency

Internship/Residency Duration	Number	Percentage
< 1 year	3	5.4%
1-2 years	31	56.4%
2 years	21	38.2%

Table 2 – Number of echocardiography services classified according to size

Size	Number of Tests	Number of Services	Percentage
Small	< 100	13	8.3%
Small to Medium	100-300	43	27.4%
Medium	300-600	40	25.5%
Medium to Large	600-1000	34	21.6%
Large	> 1000	27	17.2%

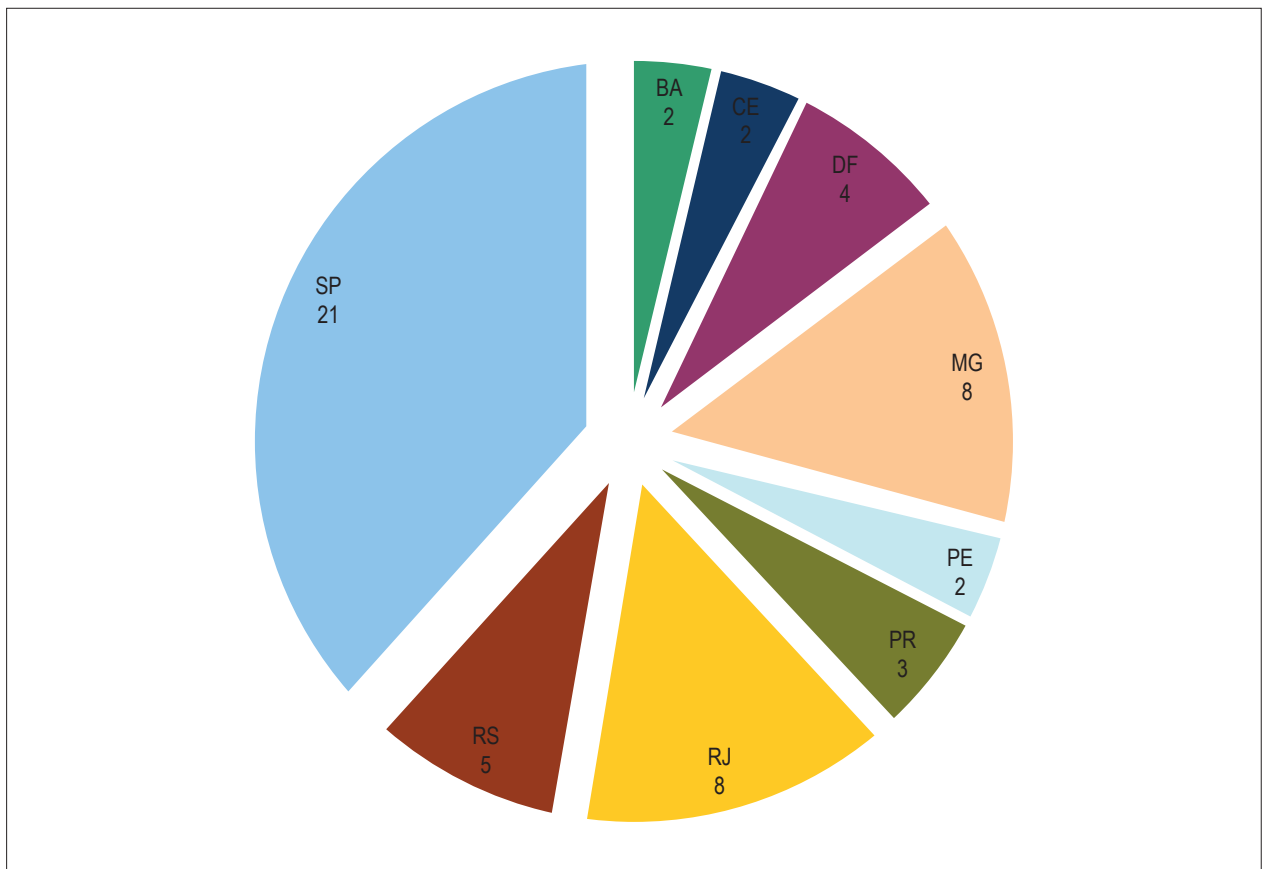


Figure 3 – Distribution by federal unit of echocardiography training centers in Brazil that fully answered the survey.

questionnaires, dismissing other 272 institutions that partially completed the survey, a criterion that reduces the sample size. Nevertheless, this might also have reduced the margin of error in the evaluation of answers. However, as demographic data is known, there is an intent to contact institutions who partially answered the questionnaire in the future, to complement the database and make it available to record new services.

Conclusion

The vast majority of echocardiography centers in Brazil have professionals qualified and trained to perform the method by the Department of Echocardiography of the Brazilian Society of Cardiology. The qualification of echocardiography centers, both in human aspect as in infrastructure, is paramount for the proper exercise of this diagnostic modality in Brazil, enabling greater efficiency and security to professionals, including their empowerment to resolve legal issues.

Authors' contributions

Research creation and design: Lira-Filho E, Morhy S, Camarozano AC, Le Bihan D, Andrade JL, Assef J; Data collection: Lira-Filho E, Morhy S; Data analysis and interpretation: Lira-Filho E; Statistical analysis: Lira-Filho E; Manuscript drafting: Lira-Filho E; Critical revision of the manuscript for important intellectual content: Lira-Filho E, Morhy S, Camarozano AC, Le Bihan D, Andrade JL, Assef J.

Potential Conflicts of Interest

No relevant potential conflicts of interest.

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Academic Association

This study is not associated with any graduate program.

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