



ORIGINAL ARTICLE

Appropriate use criteria for transthoracic echocardiography at a tertiary care center



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KEYWORDS

Echocardiography;
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Abstract

Introduction and Objectives: The American College of Cardiology and American Society of Echocardiography have developed appropriate use criteria for echocardiography. The objective of this study was to assess the rate of appropriate requests for transthoracic echocardiography at a Portuguese tertiary care center and to identify the factors associated with lower adherence to the appropriate use criteria.

Methods: All transthoracic echocardiograms (in- and outpatient) performed over a period of one month were analyzed by two independent imaging cardiologists, who matched each request to a specific indication in the appropriate use criteria document.

Results: Overall, 799 echocardiograms were included in the analysis. In 97.5% of cases it was possible to determine an indication listed in the criteria, according to which 78.7% of classifiable echocardiograms were appropriate, 15.3% inappropriate and 6.0% of uncertain appropriateness. The most common appropriate indication (111 echocardiograms) was initial evaluation of patients with symptoms or conditions potentially related to cardiac etiology, while the main inappropriate indication (59 echocardiograms) was routine surveillance of ventricular function in patients with known coronary artery disease and no change in clinical status or cardiac exam. The proportion of inappropriate echocardiograms was significantly higher among outpatients than among inpatients (18.8 vs. 4.3%, $p < 0.05$) and among cardiologists compared to other specialties (19.3% vs. 10.9%, $p < 0.05$).

Conclusions: The majority of requests for transthoracic echocardiograms at a Portuguese tertiary care center were appropriate. Requests by cardiologists and outpatient referrals presented the highest rates of inappropriateness.

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PALAVRAS-CHAVE

Ecocardiografia;
Ecocardiograma
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Critérios de
utilização apropriada

Critérios de adequação para ecocardiografia transtorácica num centro terciário**Resumo**

Introdução e objetivos: O American College of Cardiology e a American Society of Echocardiography desenvolveram critérios de utilização adequada da ecocardiografia. O objetivo deste estudo foi avaliar a taxa de pedidos apropriados de ecocardiograma transtorácico num centro terciário português e identificar os fatores associados à baixa adesão aos critérios de adequação.

Métodos: Todos os ecocardiogramas transtorácicos realizados durante um mês (internamento e ambulatório) foram analisados por dois cardiologistas independentes que estabeleceram a correspondência entre os pedidos e as indicações específicas dos critérios de adequação.

Resultados: Foram incluídos no estudo um total de 799 ecocardiogramas. Em 97,5% dos casos foi possível definir uma indicação específica. De acordo com os critérios de adequação, 78,7% dos ecocardiogramas classificáveis eram adequados, 15,3% inadequados e 6,0% de adequação incerta. A indicação adequada mais frequente (111 ecocardiogramas) foi a avaliação inicial de doentes com sintomas ou condições potencialmente relacionadas com etiologia cardíaca, enquanto a principal indicação inadequada (59 ecocardiogramas) foi a vigilância de rotina da função ventricular em doentes com doença coronária conhecida e sem alteração do seu estado clínico. A proporção de ecocardiogramas inadequados foi significativamente superior nos doentes de ambulatório comparativamente aos doentes internados (18,8 versus 4,3%, $p < 0,05$) e entre os cardiologistas comparativamente às restantes especialidades (19,3 versus 10,9%, $p < 0,05$).

Conclusões: Num centro terciário português a maioria dos pedidos de ecocardiograma transtorácico foram apropriados. Os pedidos realizados por cardiologistas e em regime de ambulatório apresentaram as taxas mais elevadas de inadequação.

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Introduction

Over the past decade, expenditure on cardiovascular imaging in general, and echocardiography in particular, have increased significantly,¹ which has raised concerns about the sustainability of this growth and potential overuse or misuse of imaging tests. In order to improve clinical practice, reduce unnecessary tests and enhance overall cost-effectiveness, the American College of Cardiology in partnership with the American Society of Echocardiography and other subspecialty societies developed appropriate use criteria (AUC) for transthoracic echocardiography (TTE). This document, first published in 2007² and updated in 2011,³ contains recommendations for the rational use of TTE, rating the grade of appropriateness of various clinical indications. Since then, there have been studies of the appropriateness of clinical requests for TTE in different settings in the USA⁴⁻⁸ and Europe.^{9,10}

The aim of this study was to assess whether TTE requests comply with the 2011 AUC at a Portuguese tertiary care center. In addition, we aimed to identify the factors associated with lower adherence to the AUC.

Methods**Study population**

The study included all TTE studies (in- and outpatient) performed over a period of one month (February 2014) at

a non-university tertiary care center that provides health services to a population of 334 000. We excluded from the analysis studies with insufficient clinical information to assign an indication and TTE performed for research purposes.

Data collection and determination of indications

Patient information was collected from request forms, medical records, previous TTE and other previous tests. The data on each patient were then analyzed by two independent imaging cardiologists, who matched each clinical scenario to a specific indication in the 2011 AUC document. If the reason for a TTE could be assigned to more than one indication, it was classified under the most appropriate indication. In patients who underwent more than one TTE study during the study period, each study was included independently in the analysis.

Statistical analysis

Continuous variables are described as means with standard deviation and categorical variables as frequencies and percentages. Comparisons were performed using the chi-square test using a p value of 0.05 for statistical significance. Analyses were performed using SPSS software (version 19.0, SPSS, Inc., Chicago, IL).

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