

***Compliance with the 2014 ESC/ESA guidelines
for preoperative cardiovascular assessment in patients undergoing
non-cardiac surgery by five tertiary hospitals in Greece:
A retrospective observational study***

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ABSTRACT

Compliance with the 2014 ESC/ESA guidelines for preoperative cardiovascular assessment in patients undergoing non-cardiac surgery by five tertiary hospitals in Greece: A retrospective observational study.

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In 2014, the European Society of Cardiology and European Society of Anaesthesiology published guidelines on preoperative assessment and management of patients scheduled for non-cardiac surgery. Compliance with these guidelines has not been evaluated in Greece. The main objective was to evaluate the level of compliance with the published recommendations. A retrospective, observational study was designed. The status 1–4 who underwent scheduled non-cardiac surgery between February 2016 and April 2016 in five tertiary hospitals were reviewed. Patients treated in intensive care units were excluded. Primary outcomes were the rates of compliance with the published recommendations for preoperative testing, continuation or not of medication and overall

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compliance. The secondary outcome measure was the time required to perform unnecessary preoperative investigations. 3197 (63.8%) preoperative electrocardiograms, 522 (83.8%) cardiac ultrasonographic imaging procedures, and 55 (93.2%) non-

invasive imaging stress tests should not have been performed. Only 101 (30.3%) and 4 (6%) patients who should or could have been evaluated by cardiac ultrasonography or a non-invasive stress test, respectively, underwent the recommended tests. None of the 1055 patients who should have discontinued angiotensin-converting enzyme inhibitors or angiotensin receptor blockers for hypertension did so; 31 (53.4%) patients with known systolic heart failure were not taking these medications as recommended. Only 27.3% of patients were being managed exactly as recommended. The 2014 guidelines for preoperative management of non-cardiac surgery patients are not being followed appropriately by hospitals in Greece.

INTRODUCTION

Cardiac complications contribute significantly to perioperative morbidity worldwide. Cardiovascular events are responsible for about 42% of overall complications after non-cardiac operations¹. Thirty percent of patients who undergo major surgery already have cardiac pathology and are considered to be at high risk for major cardiac events during the perioperative period². Correct presurgical evaluation, intraoperative management, and postoperative follow-up and interventions are important for decreasing cardiac morbidity and mortality after non-cardiac surgery. However, unnecessary preoperative testing is costly and time-consuming, increases the workload for medical staff, impacts negatively on patients' preoperative anxiety levels, and causes discomfort³⁻⁶.

In 2014, the European Society of Anaesthesiology (ESA) and the European Society of Cardiology (ESC) published detailed evidence-based guidelines for the management of these patients². The aim of this joint task force when

devising these guidelines was to help health professionals provide optimal perioperative care while avoiding unnecessary tests. The rate of compliance of hospitals with the published recommendations in Greece is unknown.

The aim of this study was to determine the level of compliance with the published recommendations for presurgical evaluation and management of patients undergoing non-cardiac surgery in Greek hospitals.

MATERIAL AND METHODS

Ethical approval to perform this retrospective observational study was obtained from the scientific board of each of the participating hospitals and from the national Hellenic Data Protection Authority (No 1940, Chairperson Mr Georgios Mpatzalexis,) on 29 June 2017. The medical records of adult patients (>18 years) who underwent any type of scheduled non-cardiac surgery between February 2016 and April 2016 at any of five tertiary hospitals in Greece were reviewed. After exclusion of pa-

tients with an ASA (American Society of Anesthesiologists) physical status >4 and those who had been treated in an intensive care unit, the records of 5009 patients were eligible for inclusion in the study.

The following data from the pre-anaesthetic evaluation sheet were recorded: age (<64 or ≥64 years), surgical risk (low/medium/high), ASA classification, history of coronary artery disease (yes/no), history of chronic heart failure (yes/no), history of a heart rate abnormality (yes/no), known valvular heart disease (yes/no), history of stroke (yes/no), insulin-dependent diabetes mellitus (yes/no), serum creatinine >2 mg/dl (yes/no), functional capacity (good/poor/cannot be evaluated/not evaluated), cardiac history, findings on physical examination, medication (β-blockers, statins, angiotensin receptor blockers [ARBs], angiotensin-converting enzyme inhibitors [ACEIs]), modifications to medication (discontinuation or initiation of any of the above medications), and preoperative cardiac investigations.

Next, we investigated whether or not the following perioperative interventions were implemented in compliance with the published recommendations: an electrocardiogram (ECG), cardiac ultrasonography (US), a heart imaging stress test (HIST), and initiation or discontinuation of medication. If any of these interventions were not performed as recommended, overall management of the patient was recorded as not

in compliance with the guidelines. The main study outcome was the rate of compliance with each of the above recommendations. The secondary outcome was the time taken to perform unnecessary tests. According to the director of the cardiology department at our hospital, it takes on average 5 minutes to perform an ECG, 15 minutes to perform a complete US examination, and 4 hours to perform a magnetic resonance stress test.

RESULTS

1.1.1. Electrocardiography

A preoperative ECG was performed in 97% of the patients; in 63.8% of these patients (n=3197), the test was performed against the recommendations. The nursing staff at each hospital spent an average of 48 minutes (10% of an 8-hour morning shift) per work day performing ECGs.

1.1.1. Ultrasonography

Six hundred and twenty-three patients were evaluated by cardiac US, and 522 (83.8%) of the examinations did not comply with the guidelines. The average amount of time spent completing the tests was 23 minutes per work day. Seventy-eight percent of the unnecessary US examinations were performed in patients with no evidence to suggest cardiopathy either in the medical history or on clinical examination. Physical activity was not evaluated in

33.3% of cases and was reported to be good in 57.3%. Unnecessary US examinations were performed in 31.7% of 574 patients with a positive history of cardiac pathology. Conversely, only 101 (30.3%) of 334 patients who should have been investigated by US actually underwent an US examination.

1.1.2. Heart imaging stress testing

Of 59 patients who underwent a preoperative HIST, only 4 should or could have performed the test, according to the recommendations. The average time spent performing HIST was 40 minutes per work day. Only 4 (6%) of 56 patients who should have been investigated by HIST actually performed the test.

1.1.3. Medication

No modifications were made to any patient's preoperative medication. All the patients who were taking β -blockers and statins continued their medication before surgery. In total, 1082 patients were receiving ARBs or ACEIs, but as part of treatment for chronic heart failure in only 27 cases. None of the patients who were receiving ARBs or ACEIs for hypertension was instructed to stop these drugs before surgery. Conversely, 27 (46.6%) of 58 patients diagnosed with chronic heart failure were not receiving ACEIs or ARBs, and none started them 1 week before surgery as they should have done.

1.1.4. Overall

The preoperative evaluation was performed exactly as recommended in only 27.3% of cases. The rate of deviation from the recommendations was very high for patients with ASA 1 (96.8%) and ASA 2 (71.6%), mainly because of the numerous unnecessary preoperative tests, and high for patients with ASA 3 (46.3%).

1.1.5. Other results

Brain natriuretic peptide and troponin testing is never used for preoperative cardiac evaluation. The average time spent completing unnecessary cardiac tests was 1 hour and 50 minutes per work day.

DISCUSSION

The results of this study reveal that the compliance of Greek hospitals with the ESA/ESC guidelines is rather poor. An ECG is still performed in almost all patients despite the fact that the guidelines strongly recommend against routinely performing ECGs. Moreover, according to our review of anaesthetic records and our clinical experience in everyday practice, anaesthetists not only demand that their patient have an ECG but also that the ECG must be evaluated by a cardiologist. US examinations and HISTs are also performed unnecessarily at an unacceptably high rate. These unnecessary tests are not only costly, but also require that medical personnel (cardiologists, nurses, technicians)

spend a high proportion of their working hours performing them and evaluating their results. Furthermore, a considerable number of patients are still being inadequately evaluated preoperatively as a result of poor medical history-taking, incomplete physical examination, and lack of assessment of physical status.

Medication was rarely changed preoperatively (anticoagulation medication was not examined in this study). One of the reasons for this lack of change in medication is the limited time interval between pre-anaesthetic interview and surgery (most patients are interviewed by the anaesthetist on the afternoon before surgery). However, even under these conditions, ACEIs or ARBs for hypertension should be discontinued on the morning of surgery as suggested by the joint task force. Unwillingness on the part of perioperative medical staff to take the responsibility for stopping or adding another drug might be another possible reason.

Inadequate training in preoperative evaluation of surgical patients might be the underlying reason for the high rates of noncompliance with the guidelines in Greece. It seems that physicians involved in perioperative care tend to overlook the importance of taking a medical history and clinical evaluation, and depend more on paraclinical tests. Another reason might be fear of litigation and the false impression that performing cardiac tests will protect anaesthetists and surgeons against claims in the

event of a complication. A study to investigate these hypotheses is required to ensure safe results. Finally, it should be noted that in most hospitals in Greece, the youngest anaesthetic, surgical, and cardiology trainees are the staff mostly involved in preoperative assessment because more senior staff are involved in more “skill-demanding” activities. An appropriately organised daily preoperative evaluation service could reduce the burden of unnecessary tests. Such a service should work under the supervision of an experienced anaesthetist, revise the guidelines, follow the changes in the recommendations, and undertake regular audits. The senior anaesthetist should take responsibility for coordinating referrals to other medical specialists (cardiologists, radiologists, nuclear medicine physicians) when needed⁷.

CONCLUSION

The 2014 guidelines for preoperative management of patients undergoing non-cardiac surgery are not being followed sufficiently by hospitals in Greece. A substantial number of needless preoperative tests are being ordered that are both costly and time-consuming. Better training of the medical personnel involved in preoperative evaluation and organisation of a specialised presurgical assessment service team might help to improve daily practice and compliance with the guidelines.

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Author Disclosures:

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