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Title: EFFECT OF ELECTROCONVULSIVE THERAPY ON THE ELECTROCARDIOGRAM AND ECHOCARDIOGRAM

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Electroconvulsive therapy (ECT) has been advocated as the antidepressant therapy of choice in cardiac patients because of the cardiotoxic effects of psychotropic drugs. Whether electrocardiogram (ECG) changes observed with ECT represents myocardial ischemia remains controversial.[1]

The concordance between ECG and precordial echocardiogram were studied in 11 patients who had adequate studies before and after ECT. Patients gave informed consent under a protocol approved by the Committee on Human Rights in Research of Cornell University Medical College.

The left ventricle was divided into 14 myocardial segments. Regional wall motion abnormalities (RWMA) were graded: normal, hypokinesis, akinesis, dyskinesis.[2] In our 11 patients 143 of 154 (93%) possible left ventricular wall regions were examined. All echocardiograms before ECT were normal. After ECT, 5 patients had hypokinesis of one or more contiguous myocardial segments, involving the apical wall in 3, the inferolateral wall in one, and the anteroseptal LV wall in one. These RWMA were confined to hypokinesis; no patient developed myocardial infarction or angina after ECT. All patients had normal baseline ECGs. Immediately after ECT, 3 patients had ECG changes consistent with myocardial ischemia (1mm downsloping or horizontal ST segment depression), one had a nonspecific ECG change (peaked T waves) and, in 7, the ECG remained normal. Three patients with RWMA developed ischemic ECG changes after ECT (sensitivity 60%), one had a nonspecific ECG change (peaked T wave) and one patient had a persistently normal ECG. There was a moderate and statistically significant concordance between ECG and echocardiographic changes during ECT in this patient population ($X^2=4.45$, $p<0.05$).

In conclusion, ECT may induce ECG changes with simultaneous RWMA that are highly suggestive of myocardial ischemia, but, in this small series these findings did not predict clinical cardiac morbidity.

References
1. Anesth Analg 69:677-679, 1986
2. Mayo Clin Proc 61:254-262, 1986

ECG response to ECT	Echocardiographic response to ECT		Number of coronary artery disease risk factors	Number of family history of heart disease
	Normal Wall Motion	Regional Wall Motion Abnormality		
Ischemia, ST depression n=3		3	3	3
Nonspecific ECG change n=1		1	1	
Normal n=7	6	1	4	3

RWMA detected by echo in all 4 of the patients whom ECG abnormalities were induced by ECT and in 1 of the 7 in whom the ECG remained normal ($X^2=4.45$, $p<0.05$).

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Title: WHO NEEDS AN ECG OR A BLOOD GLUCOSE TEST PREOPERATIVELY: USE OF TECHNOLOGY TO IMPROVE SELECTION

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Data show that more preoperative tests are ordered than are needed to benefit patients. Attempts to reduce unwarranted tests have relied on expert consensus-derived rules based on patient history, ASA physical status, and its surrogates.[1-3] One commercially available system, the HealthQuiz, reduced unnecessary preoperative tests by 30%. We sought to determine if deriving rules from the results of tests and a computer-generated patient history could lead to a more selective method for preoperative testing and if the criteria for testing so obtained would be the same in different areas of North America.

Methods: After IRB approvals, 1747 patients took the HealthQuiz, which included a patient history and generated suggestions for preoperative tests. The laboratory test results for each patient were recorded. Data were accumulated from four centers and randomly divided into 10 sets. We used classification and regression tree analysis (CART) to determine the aspects of history, singly or combined, that would capture the highest percentage of abnormal results from tests and to derive rules for testing future patients.

Results: For some tests, the CART system incorporating history from HealthQuiz and abnormal results from previous laboratory tests was able to substantially improve upon expert consensus for both sensitivity and specificity of test selection. For instance, using the rule of either a history of diabetes or a complex of three symptoms (pain on urination, an of age > 59 yrs, and a history of hoarseness for > 30 days) as the criteria for warranted blood glucose tests, we could reduce blood glucose testing by 80% without missing a significant abnormality. This improved sensitivity and specificity for selection of the blood glucose test was validated for multiple data sets. For other tests, such as chest x-ray and ECG, our rules did not improve upon *sensitivity* of test selection with the expert consensus-derived system but did improve the *specificity* of test selection. For still other tests, either too few significant abnormalities occurred to make the analysis valid, or expert consensus-derived rules could not be improved upon.

Discussion: Even with data from only 1747 patients, we could rewrite test indications to reduce testing by 60% (compared with those tests physicians recommended) and 40% (compared with those recommended by expert consensus-derived rules) and improve on the rate of significant abnormalities detected. In dollar terms, DRG-based Medicare bills of $5,000 in charges per day could be reduced to $1,500 per day—or a savings in charges of more than $800,000 per year—just for Medicare patients in one preoperative clinic. Further study is needed in larger populations to see if our method can be applied more generally and to determine its usefulness in reducing costs and improving the efficiency of perioperative care.

References: 1. Anesthesiology 73:A1254, 1990. 2. Mayo Clin Proc 66:155-159, 1991. 3. JAMA 253:3576-81, 1985