Erroneous Computer Electrocardiogram Interpretation of Atrial Fibrillation and Its Impact on Clinical Consequences

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Background: The aim of this study was to determine the frequency and nature of errors made by computer ECG analysis of AF and its clinical consequences. Methods: A total of 10,279 ECGs were collected. They were automatically interpreted by the built-in ECG software, and then reread by two cardiologists. AF-related ECGs included the three groups; overdiagnosed AF (other rhythms except AF diagnosed as AF), misdiagnosed AF (AF diagnosed as other rhythms except AF), and true AF (AF diagnosed as AF by both computer ECG interpretation and cardiologist). Results: There were 1,057 AF-related ECGs from 409 patients and among these, 840 ECGs (79.5%) were true AF. Overdiagnosis occurred in 98 (9.3%) cases. Sinus rhythm and sinus tachycardia with premature atrial contraction and/or baseline artifact and sinus arrhythmia were commonly overdiagnosed as AF. Misdiagnosis occurred in 119 (11.3%) cases where AF was usually misdiagnosed as sinus or supraventricular tachycardia. Among erroneous computer ECG interpretations, 17 cases (7.8%) were not corrected by the ordering physicians and inappropriate managements of patients were conducted. Conclusions: Erroneous computer ECG interpretation of AF was not rare. Attention should be concentrated on educating physicians about the ECG appearance and confounding factors of AF along with ongoing quality control of built-in software for automatic ECG interpretation. Keywords: atrial fibrillation, diagnostic errors, electrocardiography