CardiologyAdvisor

March 17, 2020

Supervised AI-enabled Vectorcardiography Superior to Conventional Modalities for Myocardial Ischemia Detection

Cardiology Advisor Contributing Writer

Supervised artificial intelligence-enabled vectorcardiography was found to be a valid screening tool for the detection of coronary ischemia at rest, overcoming the limitations of conventional noninvasive diagnostic modalities, according to a study published in the *Journal of Electrocardiology*.

Noninvasive methods for the detection of stable coronary artery disease (CAD) at rest are typically limited by cost, low sensitivity, or dependence on personnel expertise and availability. The investigators aimed to leverage the power of machine learning to develop a reliable time- and cost-efficient screening tool for coronary ischemia.

The international group of researchers developed a "supervised artificial intelligence algorithm combined with a five-lead vectorcardiography…approach (ie, Cardisiography, CSG) for the diagnosis of CAD," the authors wrote. Vectorcardiography allowed for interpretation of the heart's excitation process as a 3-dimensional signal. The signal's physical parameters were then analyzed using a machine learning algorithm that included neuronal networks to deliver a diagnosis. The study's primary outcome was CSG Diagnosis System accuracy, which was validated using cross-validation and compared with angiographic findings currently considered as the gold standard. The presence of CAD was defined as the involvement of 1 to 3 vessels.

Today's top picks on the Haymarket Medical Network

Depression Plus Sleep Disorder May Triple Heart Disease Risk

Sex-Based Disparities in Atherosclerotic Cardiovascular Disease Care

Genome Association Study Suggests Asthma-COPD Overlap May Be Hereditary

CONTINUE READING

Of 595 patients included in this multicenter study, 369 (62%) had 1-, 2-, or 3-vessel disease on coronary angiography. CSG identified CAD at rest with 90.2%±4.2% and 97.2%±3.1% sensitivities and 74.4%±9.8% and 76.1%±8.5% specificities in women and men, respectively. Overall accuracy was 82.5%±6.4% in women and 90.7%±3.3% in men.

Limitations of this study include its retrospective nature, the relatively small number of analyzed cases, and the fact that the interpretation of neuronal network outputs and their implications on clinical decision-making remain to be developed.

If confirmed in clinical studies, the authors project that their method could serve as an efficient "first line non-invasive diagnostic modality for the detection of CAD in primary clinical settings, emergency departments, or remote areas," which could have important implications for the screening of CAD.

Reference

Braun T, Spiliopoulos S, Veltman C, Hergesell V, Passow A, Tenderich G, Borggrefe M, Koerner MM. Detection of myocardial ischemia due to clinically asymptomatic coronary artery stenosis at rest using supervised artificial intelligence-enabled vectorcardiography – A five-fold cross validation of accuracy. *J Electrocardiol*. 2020;59:100-105.

TOPICS: CORONARY ARTERY DISEASE MYOCARDIAL INFARCTION

Back to Top ↑

TOPICS

ACS

Arrhythmia

Atrial Fibrillation

CHD

Heart Failure

Hypertension

Interventional

Metabolic

Pediatric Cardiology

Prevention

Topics

Features

News

Opinion

CME

Practice Management

RESOURCES

Drug Database

Clinical Charts

Submissions

Slideshows

Medical Calculators

Reprints/Permissions

SITE INFORMATION

About Us

Advertise

Contact Us

Staff

OTHER HAYMARKET MEDICAL WEBSITES

Cancer Therapy Advisor

Clinical Advisor

Clinical Pain Advisor

Dermatology Advisor

Endocrinology Advisor

Gastroenterology Advisor

Hematology Advisor

Infectious Disease Advisor

McKnight's Senior Living

Medical Bag

MPR

myCME

Neurology Advisor

Oncology Nurse Advisor

Ophthalmology Advisor

Psychiatry Advisor

Pulmonology Advisor

Renal & Urology News

Rheumatology Advisor

Rare Disease Advisor

haymarket®