

## Editorial



# Mobile Application Can Now Assist to Diagnose Arrhythmias with Collective Intelligence

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► See the article “Comparison of Mobile Application-Based ECG Consultation by Collective Intelligence and ECG Interpretation by Conventional System in a Tertiary-Level Hospital” in volume 51 on page 351.

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Recent advances in wearable cardiac monitoring devices and mobile application technologies have made it more accessible for general people to obtain their electrocardiograms (ECGs). Because of the massive data and the limited number of healthcare provider and accessibility issue, the necessity of the artificial intelligence-based ECG interpretation has been emerged.<sup>1)</sup> Although data-driven modelling with deep learning, a subset of artificial intelligence and machine learning, to identify disease patterns has been leveraged<sup>2)</sup> to diagnose melanoma from skin lesion images<sup>3)</sup> and to predict diabetic retinopathy from ophthalmologic images,<sup>4)</sup> diagnosing arrhythmias from ECGs using these technologies is still challenging, therefore, detecting arrhythmic diseases depends on professional electrophysiologists. Collective intelligence can be a novel option because the different opinions can exist in this area.<sup>5)</sup> Actually, there were global applications for physicians about medical issue sharing and consulting (Sermo, QuantiaMD), however, there had been no reliable ECG consulting or even medical consulting platforms for physicians in Korea.

In this edition of the *Korean Circulation Journal*, Hwang et al.<sup>6)</sup> have published the very interesting study about the usefulness of mobile application-based ECG consultation by collective intelligence. It showed that the application-based ECG consultation was very reliable and even faster than the conventional cardiology consultation system in the tertiary hospital. With this application, many nationwide cardiology doctors can response to numerous questionable ECGs and also guide the management strategies by commenting to inquiries. Therefore, questioners can receive help from the comments within 6.6 to 55.2 hours, and it was faster than that of the conventional consultation system (35.8 to 69.3 hours). This study would be able to address whether the medical issue sharing and consulting platform with collective intelligence for physicians can help them to manage patients with questionable ECG.

However, there are some issues that hard to address from this study. Although the mean time to first response of this application-based consultation system was faster than that of the conventional cardiology consultation system, it was thought that it was hard to response to the urgent situation (for example, a direct phone call can resolve the problem in the conventional system, however, it was difficult in application-based system). And there could be certain situations that some questionable ECGs are indifferent to physicians using this application. Recently, artificial intelligence-based medical image analyzing systems were

The contents of the report are the author's own views and do not necessarily reflect the views of the *Korean Circulation Journal*.

developed dramatically, it can predict the patient with hidden atrial fibrillation through sinus rhythm ECGs with analyzing 8×5,000 matrices resolution<sup>7)</sup> and it can also identify patients with heart failure from ECG.<sup>8)9)</sup> It would be helpful for such response issues if artificial intelligence-assisted ECG reading system is applied to such mobile application. Since wearable ECG monitoring devices are emerging and recorded simplified ECG data are increasing rapidly, the accessibility for arrhythmia monitoring services will be an important issue, therefore, artificial intelligence-assisted ECG diagnosis system will play a leading role. It would be interesting if other such innovative studies or applications addressing these issues are published in the future.

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