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Grace I. Judd MD, Jason Heino DO

Case Presentation

History
- 35-year-old previously healthy male
- Presented to clinic concerned that Apple Watch was episodically reporting heart rate 220 bpm at rest
- Episodes lasted 1-6 minutes before spontaneously resolving
- Further interviewing revealed episodes associated with “feeling uncomfortable” and near-syncope

Clinical Course
- EKG showed normal sinus rhythm with ventricular pre-excitation also known as Wolff-Parkinson-White (WPW) pattern
- This pattern coupled with symptomatic arrhythmias is diagnostic of WPW syndrome

Prevalence in General Population
- WPW syndrome: 0.01-0.03% \(^1\)

Clinical manifestations
- Palpitations
- Syncope or presyncope
- Chest pain

Using a Smartwatch
- User holds a finger from the opposite hand of the watch on the watch’s edge
- Timer counts down 30 seconds
- User holds a finger from the opposite hand of the watch on the watch’s edge
- Data syncs with iPhone which can be exported as PDF and shared with physician

Wolff-Parkinson-White Syndrome
A rare congenital condition with an accessory atrioventricular (AV) pathway which leads to ventricular preexcitation and can cause a supraventricular tachycardia

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- WPW syndrome: 0.01-0.03% \(^1\)

Clinical manifestations
- Palpitations
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Management\(^2\)
- Acute termination - Unstable
  - Synchronized cardioversion
- Acute termination - Stable
  - Vagal maneuver
  - Antiarrhythmic
- Chronic prevention
  - Catheter ablation (first-line)
  - Antiarrhythmic

Outcome
- Continues to have SVT as documented on watch (below)
- Confirmed residual bypass tract present, now awaiting repeat ablation

Heart Rate Over 150 — 207 BPM

Smartwatches with FDA-Approved EKG

- Fitbit Sense
- Fitbit Charge 5
- Apple Series 4-7
- Samsung Galaxy Watch 2-4

Discussion
- This case is novel in that it demonstrates how patients can be directed by their smartwatch to be diagnosed with and manage WPW syndrome
- Patients much more alarmed by smartwatch-reported tachycardia than symptoms indicating he likely would have delayed or not sought care for symptoms alone
- Observing this suggests having a smartwatch may allow patients to overcome barriers to seek care which expedites treatment
- Barriers include hesitancy to visit a clinic in setting of COVID-19, limited access to health care, and lacking establishment with a primary care provider, particularly as a young and otherwise healthy adult
- Apple Watch EKG app classification algorithm (normal sinus rhythm vs. atrial fibrillation) showed sensitivity 93% and specificity of 84% under ideal watch placement and arm positioning
- Limitations of smartwatch use include patient anxiety and unnecessary testing if device produces false positive or reads rhythm as “unclassifiable”

Takeaway Points

- Smartwatches are increasing in popularity\(^4\) with some now including FDA-approved EKG
- Smartwatches may make patients more apt to take initial action and engage with the health care system, ultimately expediting treatment
- Validity of smartwatches for detecting dysrhythmias is proven to be a good alternative to EKG for ambulatory real-time monitoring\(^5\)

Recommendation: Providers should be comfortable with the capabilities and limitations of smartwatches to better aid their patients in diagnosis and management of dysrhythmias

References

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4. Statistica. Number of connected wearable devices worldwide by region from 2015 to 2022 Available at https://www.statista.com/statistics/490231/wearable-devices-