Conclusion: COVID-19 patients that develop new onset AF, without a history of AF, are associated with increased risk for developing future clinical AF. Further studies and more intensive monitoring are needed to determine the exact burden and risk of stroke and anticoagulation implication in this patient population.

POSTER PO-626:
Featured Posters: Clinical EP and Digital Health Pod 13
Friday, April 29, 2022
12:30 PM - 2:30 PM

PO-626-01
PERFORMANCE AND ACCURACY OF A SMART WATCH SINGLE-LEAD ECG: A PILOT STUDY
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Background: Prior studies have evaluated the accuracy of the Apple Watch single-lead ECG for the detection of atrial fibrillation and other arrhythmias. However, no study to date has analyzed the watch ECG morphology and interval characteristics compared to a standard 12 lead ECG, important in assessing patients on medications and for physician overreads.

Objective: To analyze the characteristics of single-lead ECGs collected by an Apple Watch compared to a clinical 12 lead ECG.

Methods: All Mayo Clinic ECG lab patients > 18 years old were invited to participate in this study. Participants underwent a 30 second single-lead ECG recording with an Apple Watch Series 5 in a seated position within 5 minutes of 12 lead ECG (12 L). The collected ECGs were manually interpreted by physician staff. PR, QRS, QT intervals were manually calculated, and RR interval determined by computer.

Results: Seventy-four patients were included with 12 L ECG and Apple Watch ECG pairs. The cohort was 44.6% female (N=33) and 91.6% white (N=68) with an average age of 59.2. Six patients were in atrial fibrillation at the time of recording and six patients had pacemakers. The average differences between 12 L ECG and Apple Watch ECG intervals (in milliseconds) were: PR 23.3 ±18; QRS 18.9 ±16.3; QT 22 ±17.3; RR 79 ±70. Bland-Altman plots were created to visualize interval variation (Figure 1). Eleven patients were excluded from PR interval analysis as Pwaves were unable to be identified due to absence (i.e. atrial fibrillation) or other conditions (significant AV block, sinus bradycardia, low P amplitude in L I). Apple Watch ECG result interpretation was complicated by 1) aberrant inflection points before and after QRS complexes, 2) attenuation of P waves, 3) disappearance of pacemaker spikes and 4) significant artifact from a patient’s tremor (Figure 2).

Conclusion: Apple Watch ECG processing can result in peri-QRS artifact, P-wave amplitude reduction, and pacemaker spike elimination. The Apple Watch single-lead ECG appeared most reliable in determining the QT interval and least reliable in determining the PR interval (Figure 1). The findings suggest that different processing or access to raw, unfiltered Apple Watch data may facilitate expert over-reads of these signals when applied for medical use.

Figure 1: Bland-Altman plots analyzing variation between Apple Watch and 12 L, measured PR (A), QRS (B), QT (C), and calculated SBP (D) intervals. Average interval measurements (black line) with 95%Confidence interval (Mean±Standard Deviation).

Figure 2: Notable signal anomalies from Apple Watch single-lead ECG compared to baseline 12 Lead recordings.

PO-626-02
COMPARATIVE ARRHYTHMIA PATTERNS OF IBRUTINIB AND NON-IBRUTINIB TYROSINE KINASE INHIBITORS
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Background: Ibrutinib, a Bruton’s tyrosine kinase inhibitor (TKI), used primarily for hematologic malignancies, has been associated with increased incidence of atrial fibrillation (AF), but there is limited data on its association with ventricular arrhythmias (VAs). How the arrhythmia patterns of patients on ibrutinib compare to those on non-ibrutinib TKIs is unknown.

Objective: We sought to comprehensively analyze atrial and ventricular arrhythmia burden in patients on ibrutinib vs non-ibrutinib TKIs. We hypothesized that long term event monitors could reveal a high burden of both in patients on TKIs.

Methods: A single center retrospective analysis was conducted to identify consecutive patients who had 14 day event monitors while on TKI therapy.

Results: A total of 108 patients with hematologic malignancies were included (n=72 on ibrutinib and n=36 on non-ibrutinib TKI) (Figure A). The non-ibrutinib TKIs at the time of event monitoring were Imatinib (n=12), Dasatinib (n=12), Ruxolitinib (n=5), Nilotinib (n=3), Bosutinib (n=2), and Ponatinib (n=2). During ibrutinib therapy, the most common arrhythmias seen on 14-day event monitors were SVT (n=32, 44.4%), AF (n=32, 44%), and NSVT (n=31, 43%). In comparison, the non-ibrutinib TKI group had significantly lower rates of documented AF (n=7, 19%; p=0.01) and NSVT (n=8, 22%; p=0.03). The rates of non-AF SVT were not significantly different between the groups. There were non-statistically significant trends toward increased >1% PAC burden (18% (n=13) vs 8% (n=3)) and >1% PVC burden (22.2% (n=16) vs 11% (n=4)) in the ibrutinib group (Figure B). TKI therapy was held in 25% (n=18) of patients on ibrutinib vs.