The Utilization of Twelve-Lead Electrocardiography for Sudden Death after Heart Transplantation

Hung-yu Chang, An-Ning Feng, Meng-Cheng Chiang, Wei-Hsian Yin, Jeng Wei
Division of Cardiology, Cheng Hsin General Hospital, Taipei, Taiwan

Background: We aimed to look for the diagnostic potential of the 12-lead ECG for post-heart transplant (HTX) sudden death. Methods: A total of 210 patients who underwent HTX were followed at the outpatient department every month. Twelve-lead ECG was recorded on every outpatient visit. The QTc interval is calculated by Bazett’s formula. Baseline (within 3 months after HTX), final (the latest 3 months or final 3 months before mortality) and mean ECG parameters were analyzed. According to the changes between the final and baseline ECG parameters, all patients were divided into five equal groups of 20% each.

Results: Significant differences were noted between baseline and final ECG parameters in heart rate, PR interval and QRS duration (Rate 94±13bpm vs. 92±15bpm, p=0.014; PR interval 157±15ms vs. 171±23ms, p<0.001; QRS duration 95±17ms vs. 103±21ms, p<0.001), but not in QTc interval and frontal leads axis. During a follow-up interval of 85±53 months, sudden death happened in 24(11%) patients. The top-20% group of heart rate increase, QTc prolongation and the right axis deviation presented a higher incidence of sudden death when compared to other four groups. The independent predictors for sudden death were a higher mean heart rate, a higher mean QTc interval, and a larger changes of QTc interval (p<0.001, 0.021, 0.006, respectively).

Conclusion: The regular 12-lead ECG follow-up may predict post-transplant sudden death.

Keywords: sudden death, heart transplantation