Efficacy of Nifekalant in Patients with Wolff-Parkinson-White Syndrome and Atrial Fibrillation: Electrophysiologic and Clinical Findings

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Introduction: Patients with Wolff-Parkinson-White syndrome (WPW) and atrial fibrillation (pre-excited AF), are at an increased risk of spontaneous ventricular fibrillation. As the increasing reports of accelerated pre-excited ventricular responses and ventricular fibrillation, intravenous amiodarone is no longer considered the preferred recommendation for pre-excited AF with impaired left ventricular function (ILVF). Therefore, there is a need for a new agent for treatment of pre-excited AF in patients with ILVF. The efficacy of nifekalant in pre-excited AF is unclear.

Methods: The study populations were comprised of patients with sustained pre-excited AF (n=51), paroxysmal supraventricular tachycardia (PSVT, n=201), and persistent AF without accessory pathway (AP) (n=87). Effects of intravenous infusion of nifekalant was assessed on electrophysiologic and clinical parameters (Table 1).

Result: Nifekalant prolonged the shortest pre-excited R-R, the average pre-excited R-R, and the average R-R intervals from 290±35 to 333±44 ms, 353±49 to 443±64 ms, and 356±53 to 467±75 ms, respectively, in patients with pre-excited AF (all p values <0.001, Table 2). Nifekalant also decreased the percent of pre-excited QRS complexes, heart rate and increased systolic pressure (all p values <0.001, Figure 1 and 2, Table 2). Nifekalant terminated AF in 33 of 51 patients (65%). Similar effects were also observed in a subgroup of 12 patients with pre-excited AF and ILVF (Table 2). In patients with PSVT, nifekalant significantly prolonged effective refractory period (ERP), block cycle length (BCL) of antegrade AP and the atrial ERP (all p values <0.001, Figure 3). Nifekalant had no effect on ERP of antegrade atrioventricular node (AVN) (Figure 4). Finally, in patients with persistent AF without AP, nifekalant did not significantly decrease the ventricular rate of AF. One patient developed Torsades de pointes (TdP). No other adverse effects were observed.

Conclusion: Nifekalant prolongs the ERP of antegrade AP and atrium, without blocking the antegrade conduction through the AVN, leading to slowing and/or termination of pre-excited AF. Thus, nifekalant might be an effective and a relatively safe drug in patients with pre-excited AF.