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Risk stratification of sudden cardiac death in pediatric patient with accessory pathway: is there a difference between symptomatic and asymptomatic ventricular pre-excitation?

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Introduction: Incidence of atrial fibrillation is known to increase at teen age. Its rapid conduction by an accessory pathway with a short anterograde refractory period can be dramatic. If symptomatic accessory pathway are usually followed and managed either by medication at younger age or by catheter ablation, many asymptomatic ventricular pre-excitation are under the radar and first symptom can be life-threatening. Hopefully, with the EKG generalization many accessory pathway are now diagnosed at teen age. The aim of this study was to determine the electrophysiological characteristics of young patients with ventricular pre-excitation to assess and compare their potential risk of sudden cardiac death among symptomatic and asymptomatic patients.

Methods: We retrospectively investigate data of every patients with ventricular pre-excitation with or without symptom who underwent endocardial electrophysiology testing. Procedure was done under general anesthesia for every patient under 12 years old. Accessory pathway anterograde effective refractory period was determined with an extrastimuli protocol at baseline and after isoproterenol infusion. Accessory pathway was said to be malignant if anterograde effective refractory period was equal or under 240 ms at baseline and 200 ms after Isoproterenol infusion or if the shorted pre excited RR interval was less than 250 ms.

Results: From october 2009 to october 2016, 265 consecutive pediatric patients under the age of 18 had an electrophysiology testing for ventricular pre-excitation on baseline electrocardiogram. Mean age at procedure was 12.4 years old (range 5 weeks to 18 years). If the great majority of patients with accessory pathway were symptomatic (208 – 78%), for 57 (22%) ventricular pre-excitation was discovered on an electrocardiogram done incidentally. Among asymptomatic ventricular pre-excitation patients 24/56(43%) had malignancy criteria on electrophysiology testing (1 missing data), while there were only 58/189 (31%) on the symptomatic group (19 missing data).

Conclusion: Children and adolescents with ventricular pre-excitation seems to have greater risk if asymptomatic. Endocardial electrophysiological study is mandatory for every patients with ventricular pre-excitation before teen age.