Electrophysiological characteristics of paroxysmal tachycardia in children with short PQ interval

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Introduction: It is well known that children with short PQ interval can have different types paroxysmal tachycardia (PT). Combination of short PQ interval with PT is called Lown-Ganong-Levine (LGL) syndrome. We have hypothesized that in children with short PQ interval electrophysiological types of PT do not correlate with shortening of PQ interval. Purpose: The aim of the study was to assess the PT types based on results of the electrophysiological studies and radiofrequency catheter ablation (RFA), and to estimate the AV conduction parameters and their dynamic changes before and after the procedure. Materials and methods of research: 55 children with supraventricular tachycardia (SVT) and short PQ interval were examined. The examination included: ECG, 24-hour Holter monitor, transesophageal pacing study (TEPS), intracardiac electrophysiological study (EPS). 22 children underwent RFA procedure. During the period of the study 55 children had 111 TEPS and 28 EPS studies. Results: 21(38,2%) children had orthodromic AV reentrant tachycardia with accessory pathway (AVRT), 27(49,1%) had typical (slow-fast) AV nodal reentrant tachycardia (AVNRT), 2(3,6%) had atypical AVNRT, 1(1,8%) had combination of typical and atypical AVNRT, 1(1,8%) had atrial ectopic tachycardia combined with atypical AVNRT, 4(7,3%) had spontaneous atrial fibrillation or atrial flutter, 3(5,4%) had combination with typical AVNRT and 1 child(1,8%) had AVRT. PQ interval measured 107,2 ms (83-120ms). 22(40%) children underwent RFA-13 children with typical AVNRT, 9 with AVRT. In children with AVNRT tachycardia cycle length was 229-425 ms (309,8±67,6ms). Primary RFA was effective in 10(76,9%) children. The AVNRT recurrence was found in 3(13,6%) cases after 7,2±4,3 month from the time of procedure. After slow pathway ablation PQ interval length didn't change (107,1±9,1ms compared to 108,2±7,1ms; ?=0,2). No change occurred with the maximal rate of 1:1 conduction through AV node (187,8±14,8 imp/min compared to187±12,5 imp/min;?=0,2). Effective refractory period of AV node (AVNERP) increased by a small amount (288,9±14ms, compared to 266±42,7ms; ?=0,06). 9(40,9%) children underwent RFA of the accessory pathway (AP). In all of the cases there were concealed AP with the left-sided localization. AVRT cycle length was 259-382 ms (304,2±41,2ms). After RFA of concealed AP maximal rate of 1:1 conduction through AV node increased by a small amount (220±26,4 imp/min compared to 191,2±23,6 imp/min) and AVNERP decreased (256,7±25,2?s compared to 268,6±38,9?s; ?=0,09). After RFA of AP PQ interval length didn't change (110±5,9?s compared to 110±5?s; ?=0,1).Conclusion: In children with short PQ interval P? was associated with dual physiology of AV connection or with concealed AP. After the successful RFA in children with AVNRT and AVRT there was no PQ interval normalization, which remained short in all examinations. Thus, short PQ- interval is a co-existing phenomenon in children with AVNRT and AVRT.