

INTERMITTENT ANTIARRHYTHMIC THERAPY FOR ATRIOVENTRICULAR NODAL REENTRY TACHYCARDIA IN CHILDREN

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Until recent advances in pharmacology and clinical cardiology regarding pharmacodynamics of antiarrhythmic drugs and their efficiency in patients with refractory paroxysmal supraventricular tachycardia, chronic prophylactic therapy was the only treatment option for patients refusing catheter ablation. Another treatment option, also known by the eponym "pill in pocket" have been shown to be equally useful and efficacious.

The aim of our study was to carry out a prospective examination of children with refractory atrioventricular nodal reentry tachycardia (AVNRT) who were withdrawn from chronic antiarrhythmic prophylactic therapy and started with intermittent oral beta blocker treatment (propranolol at dosage 1mg/kg - max 80 mg).

Twelve children (8 boys and 4 girls) with AVNRT were included in the study. Four children did not have arrhythmia during the first six months after withdrawal and 7 children were successfully treated without complication.

Intermittent antiarrhythmic therapy in children with AVNRT could be very efficacious and useful treatment option which significantly improves their quality of life. *Acta Medica Medianae* 2007;47(1):25-27.

Key words: antiarrhythmic drugs, atrioventricular tachycardia, children

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Introduction

As a commonest paroxysmal rhythm disorder, atrioventricular nodal reentry tachycardia (AVNRT) almost always brings about considerable distress for patient, patient's family and medical worker dealing with it. Until today, there has not been still standardized arrhythmia guideline with reference to initial therapeutic approach as well as definitive treatment strategy in children with AVNRT (1).

The decision whether to start chronic or intermittent antiarrhythmic prevention in children with structurally normal heart and AVNR still relies on physician subjective estimation (2,3,4).

Recent clinical data with the reference to pharmacodynamics and therapeutic efficiency of various antiarrhythmic drugs lead in introduction of practical therapeutic approach in treating of supraventricular arrhythmias also known by the eponym "pill in pocket" (5,6,7). It comprises now

the initial treatment of adult patients with Propranolol in dosage of 80 mg or its combination with Diltiazem in dosage 120 mg.

Aims

The aim of this study was to prospectively evaluate the efficacy of intermittent antiarrhythmic treatment in children with atrioventricular nodal reentry tachycardia who were withdrawn from chronic antiarrhythmic prevention.

Material and methods

The study included twelve children, 8 boys and 4 girls, with structurally normal heart, who were previously subjected to chronic antiarrhythmic prevention therapy with beta blocker or calcium antagonist. Average prevention time before the study was $3,4 \pm 1,4$ years. All children included in a study had to have their parents' informed consent.

All families were then instructed to measure elapsed time after drug administration and how to proceed in a case of arrhythmia recurrence.

Additionally all parents were trained how to perform parallel vagal maneuvers after initial drug treatment. In a case of ANVRT attack, the children started with oral beta blocker treatment consisting of previously prepared smashed tablet of Propranolol in dosage of 1mg/kg - max 80 mg, which they drunk with a glass of lukewarm water.

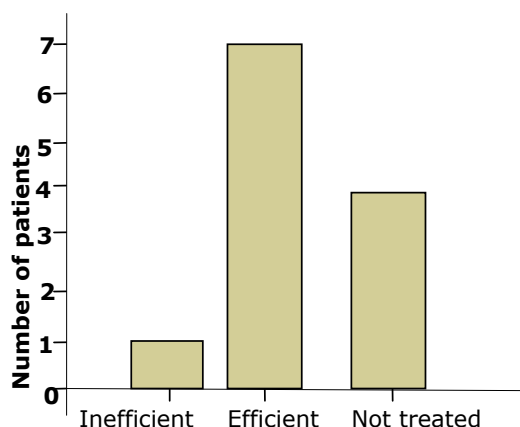
If there was not conversion into sinus rhythm, the therapy was considered unsuccessful.

The diagnosis of AVNRT was previously documented in all children according to electrocardiogram characteristics during tachycardia attack, and according to criteria established by Edgar et al (6).

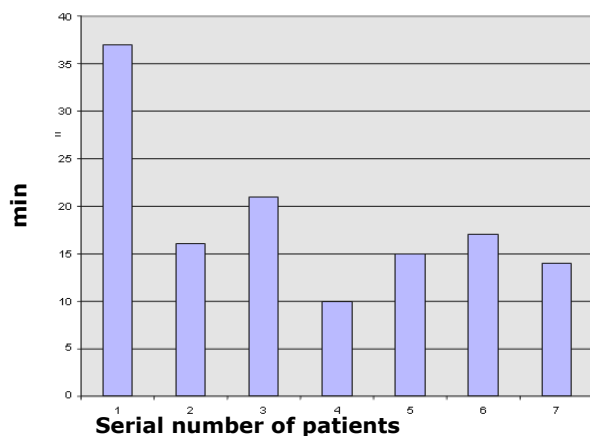
The following parameters were considered: 1) Appearance of pseudo R or pseudo S waves in some of typical leads. 2) Absence of significant T wave inversion or ST depression (>2 mm > 80 msec) 3) RP duration < 100 msec in case of P visualization. All children were followed up at least six months after treatment withdrawal. The treatment was considered inefficacious if the conversion did not occur within two hours.

Results

The children ages ranged from 9 to 18 years, mean age 12.5 ± 4.4 years. After withdrawal of antiarrhythmic treatment 4 of 12 (33,3%) children did not have AVNRT attacks in the period of six months. Seven of 12 (58,3%) children were treated successfully and only one child needed parenteral arrhythmia treatment with Adenosine. Eleven children 11/12 (91,6%) were successfully withdrawn from chronic arrhythmia prevention. The final outcome of examined children is displayed in Graph 1.



Graph 1. Success of intermittent Th with propranolol



Graph 2. Individual duration of AVNRT

Discussion

Intermittent treatment options also known by the eponym "pill in pocket" as well as radical catheter ablation are the standardized treatment options in adults with AVNRT. However, it is not widely accepted strategy in pediatric population (8).

This is the case particularly when the recognition of arrhythmia is delayed and children are hospitalized with the clinical signs of cardiogenic shock and/or heart failure. Such history and clinical picture almost always impose chronic arrhythmia prevention which frequently, due to parents' fear or indecisiveness of the physician in charge, may last for long (5).

Everyday obligation of drug taking, potentially toxic or proarrhythmic drug reaction or their proarrhythmic effects are some of undesirable side effects of chronic arrhythmia treatment. For this reason, the decision whether to start chronic or intermittent antiarrhythmic therapy of children with AVNRT still relies on physician subjective estimation (2,3,4,9). Although Musto et al., 1992, demonstrated surprisingly high efficacy of peroral intermittent administration of Flecaïnide treating children with AVNRT, this has not become routine pediatric practice yet (8).

Our results showed very high efficacy of intermittent arrhythmia treatment with propranolol. Related to the treatment outcome we had almost similar success to results of Musto et al., 1992 (10). With reference to the time elapsed until arrhythmia conversion our results are most comparable to the results of Yeh et al., 1985 (11).

During the follow-up of 12+7 months, while giving a single oral dose of Flecaïnide 3mg/kg Musto et al. demonstrated efficacy in 127/134 (94,7%) of children (10).

On the other hand Yeh et al., 1985 (11) were giving dual treatment (Diltiazem in dosage 120 mg and Propranolol in dosage 160 mg) in adults. The time elapsed until arrhythmia conversion was 21 ± 16 minutes. Irrespective of previously cited data, to our knowledge, no prospectively randomized study has been undertaken to consider any kind of intermittent treatment option in children with supraventricular rhythm disorder.

Conclusion

Our conclusion is that intermittent peroral therapy with Propranolol stands for an easy and safe treatment option for children with AVNRT, considerably improving their quality of life.

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INTERMITENTNA ANTIARITMIJSKA TERAPIJA ATRIOVENTRIKULARNIH NODALNIH RECIPROČNIH TAHIKARDIJA KOD DECE

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Iako je hronična medikamentozna prevencija pretkomorskih recipročnih paroksizmalnih tahikardija do skora bila doktrina u kardiologiji, najnovija klinička saznanja vezana za farmakodinamiku i efikasnost antiaritmjskih lekova, doprinela su uvođenju novog i praktičnijeg terapijskog pristupa u oblast aritmologije. Danas se ovakav terapijski pristup u anglosaksonskoj literaturi najčešće sreće pod eponimom "pill in pocket" što podrazumeva intermitentno davanje jednog ili kombinacije antiaritmika.

Cilj našeg rada je prospektivno ispitivanje efikasnosti intermitentne antiaritmjske terapije atrioventrikularnih nodalnih recipročnih tahikardija (AVNRT) kod dece.

Ispitivanjem je obuhvaćeno dvanaestoro dece (8 dečaka i 4 devojčice) prosečne starosti $12,5 \pm 4,4$ godina koja su sa hronične, prevedena na intermitentnu antiaritmjsku terapiju. Sva deca su u momentu napada (SVPT) uzimala Propranolol u dozi od 1 mg/kg, max doza leka (80 mg).

Nakon ukidanja antiaritmika, četvero dece u periodu od 6 meseci nije imalo napad AVNRT, jedno dete je zahtevalo hospitalizaciju radi parenteralne konverzije ritma, a kod sedmor je epizoda AVNRT uspešno konvertovana intermitentnom medikamentoznom terapijom. Komplikacija nakon primenjene terapije nije bilo.

Intermitentna antiaritmjska terapija jeste efikasna, brza i jednostavna terapijska opcija kojom se u velikoj meri popravlja kvalitet života dece sa atrioventrikularnim nodalnim recipročnim tahikardijama. *Acta Medica Medianae* 2008; 47(2):25-27.

Cljučne reči: antiaritmjska terapija, atrioventrikularna tahikardija, deca