SUMMARY

This study was carried out to assess supraventricular tachyarrhythmias in infants and children from the etiological aspect, diagnostic approach, and effect of therapy for each type.

The study was conducted on sixty four cases presented with supraventricular tachyarrhythmias.They were categorized into three groups. The first group presented with supraventricular tachycardia, second group with atrial fibrillation, and third group with atrial flutter.

All patients were subjected to the following: detailed history taking with specifically questioning the patient regarding to presence of palpitation, syncope, or symptoms of congestive heart failure; 12-lead electrocardiography; and echocardiographic assessment. Three cases were subjected to 24-hour electrocardiographic monitoring by Holter technique.

Regarding cases presented with supraventricular tachycardia, the young age is the more important determinant factor of CHF. Age at onset of supraventricular tachycardia was not predictive of presence of predisposing factors,

response to treatment, and occurrence of single recurrence.

No statistical significant difference was found between males and females with respect to presence of predisposing factors, response to treatment, and occurrence of single recurrence.

No statistically significant relation was found between presence of predisposing factors and occurrence of congestive heart failure.

More rapid heart rates were found in younger infants.

P wave was visible on the surface ECG in 53% of cases. The most common P wave axis was 270° to 360°. We found normal QRS duration and configuration in 93% of the cases. WPW was found in 19% of the cases with no prediction to age at onset of supraventricular tachycardia, and recurrence rate. 24-hour electrocardiographic monitoring by Holter technique had confirmed the same diagnosis as the 12-lead ECG in the three cases in whom it was used.

In 19% of the cases, SVT stopped spontaneously. 81% of the cases received therapy. The lines of therapy were intravenous digoxin (67% success rate), intravenous verapamil (64% success rate), intravenous adenosine in two neonates (100%

success rate), synchronized direct current electrical cardioversion (58% success rate), and vagal maneuvers (50% success rate).

Success of digoxin was unrelated to age at onset of supraventricular tachycardia or presence of congestive heart failure. However, we found digoxin to be especially effective in patients with WPW syndrome.

Success of cardioversion was found to be unrelated to age at onset of supraventricular tachycardia or congestive heart failure.

It appears that vagal maneuvers were more effective in older children.

It was confirmed that long term prophylactic drug therapy (digoxin, propranolol, digoxin and propranolo) had reduced the recurrence rate. However, among those who received treatment, none of the drug regimens proved to be significantly superior in preventing recurrence of supraventricular tachycardia.

Regarding cases of atrial fibrillation, rheumatic heart disease represented the commonest etiological factor. Occurrence of congestive heart failure was found to be high (45%).

Regarding therapy, digoxin proved to be ineffective in converting atrial fibrillation to sinus rhythm. However, digoxin proved efficacy in reducing ventricular response,hence, it was also used as a long term prophylactic drug therapy.DC cardioversion was successful in the 2 cases in whom it was used.

Regarding cases of atrial flutter, predisposing factors were found in 60% of the cases. Congestive heart failure was found in 30% of the cases.

The lines of therapy used in treating atrial flutter were DC cardioversion (83% success), and combined therapy of digoxin and Quinidine (50% success).

Long term drug therapy of digoxin and quinidine was used to prevent recurrence and proved efficacy in reducing ventricular rate in cases failed to restore their sinus rhythm.

CONCLUSIONS

It is evident from this study that disturbance of cardiac rhythm is an important aspect of pediatric cardiovascular medicine. Arrhythmias are seemingly increased in frequency as a result of longer survival after palliative and corrective cardiac surgery, and more frequent recognition by primary physician of an arrhythmia in the child with an anatomically normal heart.

The hemodynamic impact of cardiac arrhythmias is dependent on many complex and inter-related factors. Many patients report symptoms of congestive heart failure and syncope.

Supraventricular tachycardia is the most common symptomatic arrhythmia in children. Approach to diagnosis includes non invasive and invasive assessment. The noninvasive assessment is in the form of 12-lead ECG, ambulatory ECG, transtelephonic ECG, telemetric ECG,exercise stress ECG, nuclear cardiology phase analysis, and echo-cardiography.The invasive assessment is through intracardiac electrophysiology studies.

Our approach in diagnosis is restricted to 12-lead electrocardiography, ambulatory ECG, echocardiographic assessment, and in a narrow scale exercise stress ECG and intracardiac electrophysiology.

Five techniques are currently available for the treatment of tachyarrhythmias. They are pharmacologic treatment, pacing, defibrillation, direct surgery, and catheter ablation.

Our regimen of therapy is still limited to pharmacologic drug therapy, defibrillation and pacing. These methods have the disadvantages of not being curative, of periodically reminding the patient that he or she is ill, and of being expensive. Catheter ablation and surgery are curative and very effective. However, surgery is expensive and requires a major procedure.

RECOMMENDATIONS

Interaction between family practitioner, pediatrician, pediatric cardiologist, and cardiovascular surgeon is of utmost importance to assure proper treatment planning.

Advanced techniques for diagnosis of supraventricular tachyarrhythmias in the form of telemetric transmission within the hospital setting, transtelephonic transmission of cardiac rhythm, nuclear cardiology evaluation of active segment and intracardiac electrophysiology studies must be available for proper assessment and, therefore, for ideal therapeutic approach.

Since the recurrence rate can be significantly decreased with treatment, it is recommended that infants and children with supraventricular tachyarrhythmias receive long-term drug therapy.

Finally, curative therapy in the form of catheter ablation and surgery must be our goal in dealing with frequently recurrent and resistant hemodynamically compromised cases.