Comparison of Treatment of Paroxysmal Supraventricular Tachycardia by Valsalva Maneuver and Carotid Sinus Massage

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ABSTRACT

Background: Paroxysmal supraventricular tachycardia (PSVT) is a rapid rhythm disturbance originating from the atria or atrioventricular node. This is the most common paroxysmal tachycardia presenting to emergency department and often seen without heart disease.

Aim: To compare the efficacy of Valsalva maneuver (VM) with that of carotid sinus massage (CSM) in terminating PSVT in patients coming to emergency department.

Methods: This randomized controlled trial was carried out in Emergency Department of Cardiac Complex, Gulab Devi Hospital, Lahore. One hundred patients who fulfilled the inclusion criteria were randomly divided into two groups by lottery method. Electocardiography (ECG) monitoring was done, intravenous line was secured and resuscitation tray was arranged. Group-A patients were treated with VM and Group-B patients with CSM. Procedure was considered effective if it converted PSVT to normal sinus rhythm in 10 minutes.

Results: The mean age of the patients in group A was 40.1±13.1 years and in group B was 38.6±11.8 years. In Group-A, 30(60%) patients had efficacy of procedure and in group B, 18 (36%) patients had efficacy of procedure.

Conclusion: VM achieved better clinical efficacy as compared to CSM in terminating PSVT.

Key words: Paroxysmal supraventricular tachycardia, vasa1 va maneuver, carotid sinus massage, efficacy.

INTRODUCTION

Paroxysmal supraventricular tachycardia (PSVT) is a rapid rhythm disturbance originating from the atria or atrioventricular (AV) node.1 This is the most common paroxysmal tachycardia presenting to emergency department and often seen in patients without organic heart diseases.2,3 The prevalence of PSVT in general population is 2.25 / 1000 and incidence is 35/100000.4

The most common mechanism of PSVT is either a reentry circuit involving dual pathways within the AV node called atrioventricular nodal reentrant tachycardia (AVNRT) or an accessory pathway connecting the atria with the ventricles called atrioventricular reentrant tachycardia (AVRT).2,4

Electrocardiogram (ECG) of PSVT shows heart rate of 140-250 beats/min with a QRS complex of supraventricular origin and no visible P-wave in most cases.5

Manual augmentation of vagal tone by manual carotid sinus massage (CSM) or vasa1 va maneuver (VM) is the 1st line treatment for re-storing normal sinus rhythm in patients with PSVT2,4 and VM is superior in efficacy with conversion rate of 54% compared with carotid sinus massage which has conversion rate of 22%.7,8

If these maneuver prove unsuccessful, drug treatment or DC cardioversion is considered depending upon the hemodynamics of patients.1,2,5

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VM is performed by forcible exhalations against a closed airway, usually done by closing one’s mouth and pinching one’s nose shut, maintaining intrathoracic pressure up to 40 mmHg for 15 sec in spine position2,7.

CSM is performed by physician applying a solid but gentle pressure and massaging the right carotid sinus for 10-20 sec. If unsuccessful, the procedure is repeated over the left carotid sinus. Never apply pressure simultaneously on both sides and avoid the procedure if the patient has carotid bruit or history of cardiovascular accidents2.

The rationale of this study was to analyze efficacy of vagal maneuvers like VM in our population as these maneuvers have been studied internationally but no local data is available here and also these maneuvers are over looked by most of the emergency physicians due to drug reliance for conversion of PSVT. If the efficacy of vagal maneuver especially of VM is proved in our population, it will have potential or reducing morbidity in our emergency departments.

MATERIAL AND METHODS

This randomized controlled trial was carried out in Emergency Department of Cardiac Complex, Gulab Devi Hospital, Lahore. The study was done from October 2010 to April 2011. One hundred patients with PSVT as per operational definition, age 15-60 years and both sexes were part of this study. Patients with previous stroke / transient ischemic attack (TIA), carotid artery bruit, and heart transplanted patients were excluded from this study. Patients were randomly divided into Group-A and Group-B by lottery method. ECG monitoring was done, intravenous line was secured and resuscitation tray was arranged. Group-A patients were allotted VM. Group-B patients were allotted CSM. Procedure was considered effective if it converted PSVT to normal sinus rhythm within 10 minutes.

ECG was repeated 10 minutes after termination of
PSVT. ECG analysis was done by the researcher. If these maneuvers (VM & CSM) were proved unsuccessful then the patient was treated on usual line of drug treatment or DC cardioversion as per hospital protocol.

**Data Analysis:** The data were entered into SPSS version 11 and analyzed through the same. Age was presented as mean and standard deviation. Gender and efficacy were presented as frequency and percentage. Chi-square test was used to compare efficacy in both groups taken p-value ≤0.05 as significant.

**RESULTS**

The mean age of the patients in Group-A was 40.1±13.1 years and 38.6±11.8 years in group B. (Table 1). Fifteen (30%) male patients and 35 (70%) female patients comprised Group-A. Twenty (40%) male patients and 30 (60%) female patients comprised Group-B. Efficacy of procedure was seen in 30 (60%) patients of Group-A and 18 (36%) patients of Group-B with significant p value of 0.001 (Table 2).

**DISCUSSION**

The most common mechanism of PSVT is either a reentry circuit involving dual pathways within the AV node called atrioventricular nodal reentrant tachycardia (AVNRT) or an accessory pathway connecting the atria with the ventricles called atioventricular reentrant tachycardia (AVRT)²⁵

Electrocardiogram (ECG) of PSVT shows heart rate of 140-250 beats/min with a QRS complex of supraventricular origin and no visible P-wave in most cases.¹⁴

Augmentation of vagal tone by manual CSM or VM is the 1st line treatment for re-storing normal sinus rhythm in patients with PSVT and VM is superior in efficacy with conversion rate of 54% compared with carotid sinus massage which has conversion rate of 22%.⁷,⁸

In study by Mehta et al, 63% patients had efficacy of VM and 17% efficacy of CSM.¹⁰ In a study conducted by Taylor et al¹¹ the efficacy of VM was found in 16.7% patients and efficacy of CSM was not found in any patient.

According to the study of Lim et al¹² the efficacy of VM was found in 18% patients and efficacy of CSM was found in 11.8% patients.

On the above discussion, it is concluded that efficacy achieved in more patients with VM as compared to CSM in terminating PSVT. The VM should be applied during spontaneous supraventricular tachycardia before other means of termination are attempted.

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**CONCLUSION**

We concluded from our study that efficacy achieved in more patients with VM (Group-A) as compared to CSM (Group-B) in terminating PSVT.

**REFERENCES**