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CORRELATION OF PATHWAY LOCALIZATION IN ECG IN WOLFF-PARKINSON-WHITE SYNDROME WITH ELECTROPHYSIOLOGICAL (EP) STUDY.

Cardiology

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KEYWORDS

INTRODUCTION

Wolff-Parkinson-White (WPW) syndrome is a condition resulting from conduction via one or more accessory pathways that directly connects the atria and ventricles and bypasses the atrioventricular (AV) node.

Individuals with this condition have a short PR interval and a widened QRS complex on their ECG and paroxysmal tachycardia.

The accessory pathway may be located anywhere along the AV ring (groove) or in the septum. The most frequent locations are left lateral (50 percent), posteroseptal (30 percent), right anteroseptal (10 percent), and right lateral (10 percent).

The classic ECG pattern consists of a short PR interval, delta wave and a widened QRS complex. The diagnosis of WPW pattern can nearly always be made by reviewing the surface ECG. In addition, invasive electrophysiology testing can be helpful in confirming the diagnosis of an accessory pathway.

Objective: To study the correlation of pathway localization in ECG in WPW syndrome with electrophysiological(EP) study.

METHODOLOGY

The present study includes the data of 10 patients who presented to the ER with a history of palpitations, chest pain, syncope, presyncope and light headedness. On admission, diagnosis of WPW syndrome was established on the basis of ECG findings.

Our approach to map the location of the common form of accessory pathway, the accessory AV connection (AAVC), combined the algorithms of Milstein and Arruda , using this we localized the accessory pathway that helped us plan patient evaluation and anticipated outcome of the EP study.

RESULTS

A total of 10 patients of both gender between 13 to 75 years were included.

In our study population most frequent AP predicted on surface ECG using Arruda AND Milstein algorithm was right postero-septal (n=2; 20%) , left postero-septal (n=2; 20%), right lateral (n=2; 20%) ,left antero-septal (n=2; 20%) followed by left -lateral (n=1; 10%) and postero-septal (n=1; 10%)

Predictive accuracy of combined algorithm was determined by comparing the predicted AP before ablation using the algorithm with the confirmed exact location of pathway post EP study and ablation.

Milstein and Arruda algorithm was found to be accurate in predicting the exact AP(Accessory pathway) in 90% (n=9) cases.

The algorithm was quite successful in identifying right and left-sided accessory pathways, right free wall from right septal, right anterolateral from posterolateral, and anteroseptal from other right septal pathways, left anterolateral pathways were also distinguished from left posterior pathways, and right posterolateral pathways were distinguished from left postero septal pathways.

DISCUSSION

Most accessory pathways (60–75% percent) are capable of conduction and mostly in bi-direction, i.e. anterograde and retrograde, between the atrium and ventricle. However, some accessory pathways (17–37%) are only capable of conduction in a retrograde fashion from ventricle to atrium and they are correlated with tachycardia

Many studies have attempted to correlate the site of the accessory pathway with the ECG pattern. However, the electrocardiographic appearance of activation depends upon the extent of pre-excitation and fusion and, as a result, the same pathway may not always produce the same ECG pattern.

Furthermore, up to 13 percent of individuals with pre-excitation have more than one accessory pathway.

Some accessory pathways are associated with structural heart abnormalities.

However in the presence of previous myocardial infarction (MI), hypertrophy or congenital heart disease, the situation will become worse.

Since the ECG pattern of WPW depends on the vector of activation so any change in the position of the heart inside the thoracic cavity due to congenital or acquired causes will affect the appearance of pre-excitation on the surface ECG.

Application of ECG leads on the body surface in different position will affect the appearance of the pathway and so application of the algorithm is difficult.

CONCLUSION

Patients with a preexcitation syndrome have an additional or alternative pathway, known as an accessory pathway, which directly connects the atria and ventricle and bypasses the atrioventricular (AV) node.

Distinctly classifying the posteroseptal/midseptal/anteroseptal areas helped us prepare the patient for different treatment options, including radiofrequency ablation, medical therapy, or monitoring.

Successful ablation of accessory pathway in WPW syndrome needs pre ablation - proper identification and proper degree of temperature at reasonable power.

We found the combined algorithm to be very much helpful for localization of accessory pathways on the surface ECG as such localization facilitates procedural planning.

REFERENCES:

1) Arruda MS, Mc Clelland JH, Wang X, Beckman KJ, Widman LE, Gonzalez MD, et al. Development and validation of an ECG Algorithm for Identifying Accessory Pathway Ablation Site in Wolff-Parkinson-White Syndrome. J Cardiovasc Electrophysiol 1998;9(1):2–12.
2) Wolff L, Parkinson J, White PD. Bundle-branch block with short P-R interval in healthy young people prone to paroxysmal tachycardia. 1930. Ann Noninvasive Electrocardiol 2006;11(4):340–53.
3) Milstein S, Sharma AD, Giruadon GM, Klein GJ. An algorithm for the electrocardiographic localization of accessory pathways in the Wolff-Parkinson-White syndrome. Pacing Clin Electrophysiol 1987;10(3 Pt 1):555–63.