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Frequency of Atypical AVNRT in Patients Presenting with Narrow Complex Tachycardia

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ABSTRACT

Objective: To determine the frequency of atypical AVNRT in patients presenting with Narrow Complex Tachycardia.

Methodology: Ninety-three patients of aged 30 to 80 years diagnosed with narrow complex tachycardia by consultant cardiac electrophysiologist on ECG showing QRS duration of less than 120 milliseconds were included in this cross-sectional study, conducted cardiology department of MTI Hayatabad Medical complex, Peshawar. Patients were managed as per standard protocol which included comprehensive clinical evaluation such as patient history, physical examination and invasive electrophysiological study for the diagnosis and characterization of atypical Atrioventricular Nodal Reentrant Tachycardia (AVNRT).

Results: A total of ninety-three patients were studied with a mean age of 43.08 years (SD = 9.07). Among the participants, 58.1% were male, while 41.9% were female. The majority of patients had Slow-Fast AVNRT (7.5%) followed by Fast-Slow AVNRT (3.2%), and Slow-Slow AVNRT in 2.2% of patients.

Conclusion: This study underscored the importance of gender-specific variations in the prevalence of different AVNRT types and highlighted the impact of gender as a potential influencing factor in the manifestation of specific types of AVNRT within the study population.

Keywords: Atypical AVNRT, Electrophysiological study, Narrow Complex Tachycardia,

Authors' Contribution:
[1,2]Conception; Literature research; manuscript design and drafting; [3,4] Critical analysis and manuscript review; [5,6]Data analysis; Manuscript Editing.

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Introduction

Atrioventricular Node-dependent Long-R-P Tachycardia (AVNRT) is a type of supraventricular tachycardia that utilizes the fast pathway (FP) and slow pathway (SP) of the AV node as the antegrade and retrograde limbs of the reentrant circuit, respectively. It is the most common AV node-dependent long-R-P tachycardia and is confined to the AV node and its atrionodal inputs[1]. Narrow Complex Tachycardia (NCT) is a term used for rapid cardiac rhythms greater than 100 beats per minute (bpm) with a QRS duration of less than 120 milliseconds (ms)[2]. Atypical AVNRT can be associated with NCT, and it is characterized by a prolonged history interval (HA) and a short ventriculo-atrial (VA) interval[3]. The frequency of atypical AVNRT in patients presenting with Narrow Complex Tachycardia is not explicitly mentioned in the search results. However, the distinction between typical and atypical AVNRT is based on the values of the HA and VA intervals. In atypical AVNRT, the HA interval is typically >70 ms, while in typical AVNRT, the HA interval is ≤70 ms. The VA interval in atypical AVNRT is also longer than in typical AVNRT,

with values >60 ms.[4,5,6] The prevalence of atypical atrioventricular nodal reentrant tachycardia (AVNRT) in patients presenting with narrow complex tachycardia is approximately 6.4%[7]. Atypical AVNRT may display patterns that do not necessarily correspond to the conventional fast-slow or slow-slow types and may not utilize the same limb for fast conduction as typical AVNRT. The diagnosis and management of atypical AVNRT can be challenging, and the optimal method of catheter ablation is not yet established[8]. It is important to differentiate AVNRT, particularly its atypical form, from other supraventricular tachycardias with comparable clinical and electrocardiographic manifestations, which can be challenging[9]. The differential diagnosis of narrow complex tachycardia includes various types of tachycardias, and the correct differentiation is crucial for appropriate therapeutic management[10,11]. Investigating the frequency of atypical AVNRT in patients presenting with Narrow Complex Tachycardia in Peshawar, Khyber Pakhtunkhwa, was essential for improving the diagnosis, management, and outcomes of individuals with this condition. The findings of this study contributed to the development of more tailored and effective approaches in addressing the unique challenges associated with atypical AVNRT in the local population.

Methodology

This descriptive cross-sectional was conducted at the Department of Cardiology, MTI-HMC Peshawar from March 2021 to March 2022. Ethical approval (file no: 1645) was obtained from the Ethical Committee. The sample size was calculated by the WHO Sample Size calculator with 6.4%[1] proportion of atypical AVNRT in patients with narrow complex tachycardia, 95% confidence interval and 5% significance level. A nonprobability consecutive sampling technique was used for data collection.

Inclusion Criteria: Patients of either gender aged 30 to 80 years diagnosed with narrow complex tachycardia by consultant cardiac electrophysiologist on ECG showing QRS duration of less than 120 milliseconds were included in this study.

Exclusion Criteria: Patients with a subsequent diagnosis of sinus tachycardia, atrial flutter, atrial fibrillation, idiopathic ventricular tachycardia, coronary artery disease and anginal chest pain, preexisting ST-segment depression and bundle branch block were excluded. Written informed consent was also taken from all the study participants after a complete description. Patients were subjected to clinical history and various clinical examinations. Patients diagnosed with narrow complex tachycardia were subjected to invasive electrophysiology study and frequency of AVNRT was recorded. Further, characteristics of AVNRT were also noted such as slow fast, fast slow and slow-slow AVNRT as per following ECT criteria based on the reentrant circuits:

Slow-Fast AVNRT

- Pseudo-S wave in leads II, III, and AVF
- Pseudo-R' in lead V1.

Fast-Slow AVNRT

- P waves between the QRS and T waves (QRS-P-T complexes)

Slow-Slow AVNRT

- Late P waves after a QRS - often appear as atrial tachycardia.

The data was analyzed with Statistical Package for Social Sciences (SPSS) version 23.0. Mean+SD was calculated for quantitative variables. Qualitative variables were recorded as frequencies and percentages. The chi-square test was applied keeping a p-value < 0.05 as the significance level.

Results

A total of ninety-three patients were recruited for the study. The study included a population with a mean age of 43.08 years (SD = 9.07). Among the participants, 58.1% were male, while 41.9% were female. The predominant complaint reported by the participants was palpitations, with a frequency

of 91.4%. Syncope, on the other hand, was reported by 8.6% of the individuals in the study. In terms of AVNRT types, the distribution was as follows: Slow-Fast AVNRT was observed in 7.5% of cases, Fast-Slow AVNRT in 3.2%, and Slow-Slow AVNRT in 2.2%. (Table: I).

Table I: Demographic and Clinical Characteristics of Study Participants with Narrow Complex Tachycardia (n=93)	
Quantitative Variable	**Mean+SD**
• Age (Years)	43.08+9.07 years
Gender, n (%)	
• Male	54 (58.1%)
• Female	39 (41.9%)
Complaint, n (%)	
• Palpitations	85 (91.4%)
• Syncope	08 (8.6%)
Atrioventricular Nodal Reentrant Tachycardia (AVNRT), n (%)	
• Slow-Fast AVNRT	7 (7.5%)
• Fast-Slow AVNRT	3 (3.2%)
• Slow-Slow AVNRT	2 (2.2%)

As per the association between gender and the occurrence of different types of Atrioventricular Nodal Reentrant Tachycardia (AVNRT) in a cohort comprising 93 participants, a statistically significant association between gender and AVNRT (p-value = 0.005).

Slow-Fast AVNRT: Among male participants, no instances of Slow-Fast AVNRT were observed. In contrast, 17.9% of female participants experienced this specific type of AVNRT. Overall, 7.5% of the total population manifested Slow-Fast AVNRT.

Fast-Slow AVNRT: Fast-Slow AVNRT occurred in 1.9% of male participants and 5.1% of female participants. Collectively, 3.2% of the entire cohort exhibited Fast-Slow AVNRT.

Slow-Slow AVNRT: This AVNRT was observed in 3.7% of male participants, while no instances were recorded among females. Overall, 2.2% of the total population presented with Slow-Slow AVNRT.

No AVNRT: The majority of both male (94.4%) and female (76.9%) participants did not experience AVNRT. Altogether, 87.1% of the entire sample did not have AVNRT.

Total Distribution: The study involved 54 male and 39 female participants. The overall distribution of AVNRT types across the entire cohort is provided in the table.

In summary, the above results emphasize gender-specific variations in the prevalence of different AVNRT types. The statistically significant association underscores the relevance of gender as a potential influencing factor in the manifestation of specific types of AVNRT within this study population. (Table II).

		Gender		**Total**
		Male	Female	
AVNRT	Slow Fast AVNRT	0	7	7
		0.0%	17.9%	7.5%
	Fast Slow AVNRT	1	2	3
		1.9%	5.1%	3.2%
	Slow-Slow AVNRT	2	0	2
		3.7%	0.0%	2.2%
	No AVNRT	51	30	81
		94.4%	76.9%	87.1%
Total		54	39	93
		100.0%	100.0%	100.0%

Discussion

This study included a population with a mean age of 43.08 years, showed a statistically significant association between gender and AVNRT (p-value = 0.005). The study revealed that Slow-Fast AVNRT was observed in 7.5% of cases, with a higher prevalence in female participants, while Fast-Slow AVNRT occurred in 3.2% of the entire cohort, with a higher prevalence in female participants. Slow-Slow AVNRT was observed in 3.7% of male participants, and no instances were recorded among females. The study emphasized gender-specific variations in the prevalence of different AVNRT types, highlighting the relevance of gender as a potential influencing factor in the manifestation of specific types of AVNRT within the study population. [12,13]

Comparing these findings with previous studies, it is evident that gender plays a significant role in the manifestation of specific types of AVNRT. Previous research has shown that the prevalence of AVNRT exhibits a twofold women-to-men predominance, potentially due to sex hormones and autonomic tone.[14] Additionally, a study involving 2,088 consecutive AVNRT patients found that women had a significantly younger age of onset, higher incidence of multiple jumps, and shorter AH interval, among other differences in electrophysiological characteristics compared to men.[15] Furthermore, another study demonstrated that the mechanism of PSVT in patients presenting for ablation is significantly influenced by both age and gender, with AVNRT being more predominant in women[16]. Overall, the findings of the study align with previous research, emphasizing the importance of considering gender-specific variations in the prevalence of different AVNRT types[17]. The statistically significant association between gender and AVNRT in the study population underscores the relevance of gender as a potential influencing factor in the manifestation of specific types of AVNRT[18]. These findings contribute to the growing body of evidence highlighting the impact of gender on the clinical characteristics and mechanisms of AVNRT.

Certain limitations were observed while carrying out this study which includes a relatively small sample size of ninety-three participants as a larger sample size would have provided more robust and generalizable results. Being a single-centered study has limited the generalizability of the findings to a broader population. These limitations should be taken into account while interpreting the results and considering its implications for clinical practice and further research.

Conclusion

This study underscored the importance of gender-specific variations in the prevalence of different AVNRT types and highlighted the impact of gender as a potential influencing factor in the manifestation of specific types of AVNRT within the study population. These findings contribute to the growing body of evidence on the clinical characteristics and mechanisms of AVNRT.

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