

MULTIFOCAL ATRIAL TACHYCARDIA IN CASES OF CHRONIC OBSTRUCTIVE PULMONARY DISEASE

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ABSTRACT

Background: Multifocal atrial tachycardia can present in Chronic Obstructive Pulmonary Disease. **Objective:** To determine the frequency of multifocal atrial tachycardia in cases with Chronic Obstructive Pulmonary Disease. **Methodology:** This was a cross sectional study that was conducted at Sheikh Zayed Hospital, Rahim Yar Khan, from 1st July to 31st December 2017. The cases of COPD irrespective of gender and age, more than 40 years with COPD diagnosed at least for more than 1 year were included. The diagnosis of COPD was made according to the GOLD COPD guideline with FEV1/FVC ratio < 0.70 and with insignificant bronchodilation of less than 12%. They were subdivided according to GOLD guidelines. The cases with end stage renal, liver or cardiac disease and those with electrolyte imbalance were excluded. The diagnosis of multifocal atrial tachycardia (MAT) was made where there was heart rate of more than 100 beats per minute and P wave revealed at least three different morphologies on ECG. Data was entered in SPSS version 23 and analyzed. **Results:** In present study, 100 cases of COPD were included with mean age of 51.41±9.43 years. There were 78 (78%) males and 22 (22%) females. MAT was seen in 12 (12%) of the cases. There was no significant difference in terms of gender with p= 1.04. MAT was significantly high in cases that had COPD for more than 5 years where it was seen in 10 (15.15%) of cases with p= 0.03. MAT was also significantly high were it was observed in 10 (14.70%) of cases with very severe disease and none in mild disease with p= 0.02. **Conclusion:** Multifocal atrial tachycardia (MAT) is seen in almost every 10th cases and it is significantly high in cases with duration of COPD more than 5 years and with very severe disease. **Key words:** COPD, Severity, Multifocal atrial tachycardia

INTRODUCTION

Chronic obstructive pulmonary disease (COPD) is one of the most common presentation in the later age groups at the medical and especially pulmonology departments and clinics.^{1,2} It is highly symptomatic disease and can be caused by various obnoxious agents and exposures.³ Smoking, pollution, biomass fuel exposure are the top causes leading to its development.⁴⁻⁶ Its number is rising day by day not only in the developed world, but also in the developing ones as well.^{1,2} COPD has two major types; emphysema and chronic bronchitis.^{6,7}

It can lead to various signs and symptoms like cough, shortness of breath and hypoxia.⁸ GOLD COPD is a consensus guideline that are released every year to guide for better diagnosis and management plans. X ray chest and pulmonary function tests are the diagnostic modalities of choice to not only diagnose but also categorise its severity to plan further management.⁹⁻¹¹

There are wide range of complications that can result from COPD and these include respiratory failure, pulmonary hypertension, cor pulmonale, arrhythmias, osteoporosis and polycythaemia.⁹⁻¹²

These complications can worsen the over all morbidity and can endanger to life threatening risks. Multifocal atrial tachycardia (MAT) is one of these common arrhythmia seen in cases of

COPD and needs to be looked out to intervene to avoid any untoward effects.⁵⁻⁸ The objective of this study was to determine the frequency of multifocal atrial tachycardia in cases with chronic obstructive pulmonary disease.

METHODOLOGY

Study Design: Cross sectional study. **Setting:** Department of Medicine, Sheikh Zayed Hospital, Rahim Yar Khan

Duration of Study: 1st July to 31st December 2017

Sampling Technique: Non-probability, consecutive sampling. **Sample selection:** The cases of COPD, irrespective of gender and age more than 40 years, with COPD diagnosed at least for more than 1 year, were included. The diagnosis of COPD was made according to the GOLD COPD guideline with FEV1/FVC ratio < 0.70 and with insignificant bronchodilation of less than 12%. They were subdivided according to GOLD guidelines. The cases with end stage renal, liver or cardiac disease and those with electrolyte imbalance were excluded. The diagnosis of MAT was made where there was heart rate of more than 100 beats per minute and P wave revealed at least three different morphologies on ECG.

The data was analysed by SPSS version 23. Post stratification with confounding variables, chi square test was applied, taking $p \leq 0.05$ as significant.

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Received: 21-04-2018

Accepted: 13-08-2018

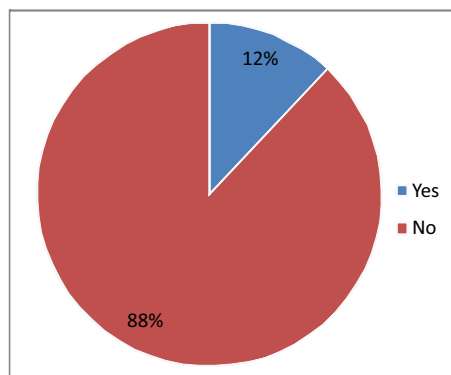
RESULTS

In present study, 100 cases of COPD were included with mean age 51.41 ± 9.43 years. There were 78 (78%) males and 22 (22%) females. MAT was seen in 12 (12%) of the cases as in figure I. There was no significant difference in terms of gender with $p=1.04$ as in table 1. MAT was significantly high in cases that had COPD for more than 5 years where it was seen in 10 (15.15%) of cases with $p=0.03$. MAT was also significantly high it was observed in 10 (14.70%) of cases with very severe disease and none in mild disease with $p=0.02$ (Table I).

Table I: Multifocal atrial tachycardia versus Gender, duration and severity of COPD

| Gender | Multifocal atrial tachycardia | | Total | P Value |
|------------------|-------------------------------|-----------------|-------------------|---------|
| | Yes | No | | |
| Male | 9 (11.54%) | 69 (88.46%) | 78 (100%) | 0.02 |
| Female | 3 (13.64%) | 19 (86.36%) | 22 (100%) | |
| Total | 12 (12%) | 88 (88%) | 100 (100%) | |
| Duration of COPD | Multifocal atrial tachycardia | | Total | P Value |
| | Yes | No | | |
| < 5 years | 2 (5.88%) | 32 (94.12%) | 34 (100%) | 0.03 |
| > 5 years | 10 (15.15%) | 56 (84.85%) | 66 (100%) | |
| Total | 12 (12%) | 88 (88%) | 100 (100%) | |
| Severity of COPD | Multifocal atrial tachycardia | | Total | P Value |
| | Yes | No | | |
| Mild | 0 (00%) | 4 (100%) | 4 (100%) | 0.02 |
| Moderate | 1 (7.14%) | 13 (36.54%) | 14 (100%) | |
| Severe | 1 (7.14%) | 13 (30.77%) | 14 (100%) | |
| Very Severe | 10 (14.70%) | 58 (00%) | 68 (100%) | |
| Total | 12 (12%) | 88 (88%) | 100 (100%) | |

Figure I: Frequency of Multifocal atrial tachycardia



DISCUSSION

COPD is a highly morbid disease and it can further predispose to the symptoms when there are complications associated with it.^{4,5} Wide variety of complications develop and usually cardiac complications are more associated with COPD as they share common risk factors as well.⁶ Arrhythmias especially multifocal atrial tachycardia is one of these under rate arrhythmia associated with COPD.⁷ In present study the multifocal atrial tachycardia (MAT) was seen in 12 (12%) out of 100 cases. This finding was similar to the studied done in the past.⁸⁻¹⁰ According to a study done by Kastor JA, the incidence of MAT was observed to be 13,3% of the cases in their study.⁸ While in another study done by Pierce WJ et al, there was slight lower incidence reported and it was seen in less than 5% of the cases.⁹ The difference of these studies can be explained by the difference in the operational definition as well the inclusion criteria of the subjects in the form of age and severity of disease.

MAT was seen significantly high in number in cases that had very severe disease ($=0.02$) and those with duration of COPD more than 5 years with $p=0.03$. This finding was also supported by the studies in the past where not such cut off values were used but correlation and association was seen that the severe the disease and longer the duration of the disease and higher are the chances to develop various arrhythmias including MAT with p values less than 0.05.¹⁰⁻¹³ This can be explained by the fact that longer and severer is the disease, more is the stress on right side of the heart and it is further dilated due to increased pulmonary hypertension and predispose the different types of arrhythmias.

CONCLUSION

Multifocal atrial tachycardia is seen in almost every 10th cases and it is significantly high in cases with duration of COPD more than 5 years and with very severe disease.

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Article Citation: Farooq U, Tariq MA, Amjad U. Multifocal atrial tachycardia in cases of chronic obstructive pulmonary disease. *JSZMC* 2018;9(3): 1450-1452.