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Original Research Article

INCIDENCE OF RIGHT VENTRICULAR INFARCTION IN PATIENTS WITH INFERIOR WALL MYOCARDIAL INFRACTION

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Abstract: *The prospective study was conducted in the Department of Cardiology, Nishtar Medical Hospital & CPEIC Multan from August 2020 to February 2021 to evaluate the frequency of right ventricular infarction in subjects with inferior wall myocardial infarction. A total of 110 patients were included. Age, gender, smoking history, dyslipidemia, diabetes mellitus, and hypertension were recorded. Clinical and radiographic examination was done, and the right ventricular infarction was recorded accordingly. Results showed that of 110 subjects, 43 (39.09%) had right ventricular infarction. Thus, it was concluded that right ventricular infarction is highly prevalent in subjects with inferior wall myocardial infarction. Early diagnosis and treatment are important for reducing morbidity and mortality.*

Keywords: Right ventricular infarction, inferior wall, myocardial infarction

Introduction

The prevalence of coronary artery disease (CAD) has doubled during the last two decades. It is more common in urban than rural populations (Heidenreich et al., 2022). Inferior wall myocardial infarction (MI) is a common clinical event and has a better prognosis than anterior wall MI. The mortality rate of inferior wall MI ranges from 2% to 9%, and almost half of such patients have a favorable prognosis (Hanson and Goldstein, 2018). The WHO estimated that it is the most common cause of death in developed countries and the second most common cause in developing countries (Albulushi et al., 2018). Globally, more than 4 million people have NSTEMI, and 3 million have STEMI yearly (Ngaïdé et al., 2017).

Right ventricular infarction (RVI) was recognized in subjects with inferior wall MI. Despite normal left ventricular filling pressure, these patients demonstrated increased right ventricular filling pressure and right ventricular failure (Firdaus et al., 2020). The increasing incidence of right ventricular infarction, alone or associated with left ventricular infarction, emphasizes the importance of normal functioning of the right ventricle (Saif et al., 2020). Right and left ventricles have different anatomy, metabolism, loading condition, and mechanics, thus having different characteristics and ischemic responses (Malik et al., 2017).

Acute inferior wall MI commonly involves the right ventricle. Right ventricular infarction leads to atrioventricular conduction block, hemodynamic instability, and mortality in inferior MI patients. A study reported that the incidence of right ventricular infarction in patients with inferior wall MI was 48.5% (Khan et al., 2023). Another study reported this incidence to be 40.1% (Ahmed et al., 2023). Though different studies have been conducted to evaluate the frequency of RVI in subjects with inferior wall myocardial infarction, their findings are quite variable. Thus, this study evaluates data and assesses the prevalence of right ventricular infarction in patients with inferior wall MI.

Methodology

The prospective study was conducted in the Department of Cardiology, Nishtar Medical Hospital & CPEIC Multan from August 2020 to February 2021. The study included patients aged between 30 to 80 years who had inferior wall myocardial infarction. Patients with a history of chronic renal failure, CABG and PCI and those with ferromagnetic intracranial metallic implants, defibrillators, and pacemakers were excluded. A total of 110 participants were

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included in the study. Informed consent of the participants was taken. The ethical board of the hospital approved the study. Age, gender, smoking history, dyslipidemia, diabetes mellitus, and hypertension were recorded. Clinical and radiographic examination was done, and right ventricular infarction was recorded.

SPSS version 23.0 was used for data analysis. Age and disease duration (inferior wall MI) were presented as mean and standard deviation. Gender, smoking history, dyslipidemia, diabetes mellitus, hypertension, and presence or absence of right ventricular infarct were presented as frequency. Gender, age, disease duration, diabetes mellitus, hypertension, dyslipidemia, and smoking were stratified. A Chi square test was done to evaluate the effect of these variables on right ventricular infarction. P value < 0.05 was considered statistically significant.

Results

The age of the patients was 55.48 ± 11.78 years. Of 110 subjects, 22 (20%) were female, and 88(80%) were male. 59 (53.65%) subjects aged between 51 to 80 years. Table I shows the frequency of subjects with hypertension, diabetes mellitus, smoking, and dyslipidemia. 43 (39.09%) subjects had right ventricular infarction. Stratification shows that age, gender, and duration of symptoms had no significant impact on right ventricular infarction, while diabetes mellitus (P=.046) and hypertension (P=.044) had a significant association with the incidence of right ventricular infarction. The effect of study variables right ventricular infarction in patients with inferior wall MI is shown in Table II

Table I: Sample distribution with respect to study variables.

Variables		Frequency	%age
Diabetes Mellitus	Yes	34	30.91
	No	76	69.09
Hypertension	Yes	41	37.27
	No	69	62.73
Smoking	Yes	54	49.09
	No	56	50.91
Dyslipidemia	Yes	19	17.27
	No	91	82.73

Table II Association between study variables and RVI

Variable	Right Ventricular Infarction		P-value
	Present	**Absent**	
Age(years)			
30-55	19	40	.111
56-80	24	27	
Gender			
Male	36	52	.434
Female	07	15	
Smoking			
Yes	20	34	.665
No	23	33	
Duration of symptoms (hours)			
1-6	37	48	.079
7-23	06	19	
Diabetes mellitus			
Yes	18	16	.046
No	25	51	
Hypertension			
Yes	21	20	.044
No	22	47	
Dyslipidemia			
Yes	7	12	.825
No	36	55	

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Discussion

Right ventricular infarction is a common clinical event. Its early detection and treatment reduce morbidity and mortality in inferior wall MI (Díaz-Munoz et al., 2021). In the current study, 39.09% of subjects with inferior wall MI had right ventricular infarction. A previous study by Khandait et al. reported that 48.5% of patients with inferior wall MI had RV I(Khandait et al., 2019). And another study conducted by Aziz showed that 20 of 50 (40%) patients had associated right ventricular infarction. Their mean age was 54.66±31 years, and the majority of the study population was male(Aziz, 2021); these findings were consistent with the results of the current study. Another study reported the frequency of right ventricular infarction to be 37.5%; it was also found that second and third-degree heart block increases morbidity in those with inferior wall MI.

In the current study, the mean age of the subjects was 55.49 ± 11.79 years, and 88% were male; the previous study reported a similar male preponderance (Khandait et al., 2019). In the current study, gender was not significantly associated with right ventricular infarction occurrence. However, a study showed that female patients are at increased risk of right ventricular infarction (Obradovic et al., 2015). In the current study, 49.09% of patients were smokers, and no significant association was found between smoking and the incidence of RVI in patients with inferior wall MI, in contrast to a previous study which reported smoking as a risk factor for right ventricular infarction (Obradovic et al., 2015). In the current study, a significant link was seen between diabetes and the development of RVI in patients with MI. A previous study also had similar findings and reported a 45.3% prevalence of diabetes in such patients(Khalid et al., 2019). In the current study, hypertension significantly impacted the incidence of RVI, similar to the findings of a previous study (Khalid et al., 2019). The limitation of this study is the small sample size; a larger study is recommended for further evaluation.

Conclusion

Patients with inferior wall MI have a high incidence of right ventricular infarction. Early diagnosis and treatment are important for reducing morbidity and mortality.

Conflict of interest

The authors declared absence of conflict of interest.

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