A study of various associated abnormalities in the patients with low voltage ECG at tertiary health care centre

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Abstract Background: Low electrocardiographic QRS voltage (LQRSV) can be defined as QRS amplitudes of the QRS complexes of less than 0.5 mV in all the frontal leads and less than 1.0 mV in all the precordial leads. Aims and Objectives: To Study various associated Abnormalities in the patients with low voltage ECG at Tertiary health care centre. Methodology: This was a cross-sectional study carried out in the Department of Medicine during the one year period i.e. October 2017 to October 2018 in the patients who showed low voltage ECG at tertiary health care centre. During the one year period with written and explained consent there were 50 patients who showed low voltage ECG were enrolled for the study. All details of the patients like age, sex, BMI (Body Mass Index) noted. All of them undergone all routine testing and specific investigations to find out any associated abnormality like X-ray, 2-D echo thyroid function etc was done. Entered to excel. Data was analyzed by Excel software for windows 10. Result: The majority of the patients were in the age group of 50-60 were 30% followed by 40-50 Were 24%, >60 were 22%, 30-40 were 18%, 20-30 were 6%. The majority of the patients were Male i.e. 68% and Female were 42%. The most common associated abnormality was Pericardial effusion was 34%, followed by COPD in 28%, H/o Recent MI in 22%, H/o Hypothyroidism in 10%, Morbid obesity (BMI>40) in 6%. Conclusion : It can be concluded from our study that the majority of the patients were in the age group of 50-60 and associated abnormality were Pericardial effusion, COPD, Recent MI, Hypothyroidism, Morbid obesity (BMI>40)

Key words: Low voltage ECG(LQRSV), Pericardial effusion, COPD, MI, Hypothyroidism.

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Received Date: 12/03/2019 Revised Date: 20/05/2019 Accepted Date: 09/07/2019 DOI: https://doi.org/10.26611/102111112



INTRODUCTION

Low electrocardiographic QRS voltage (LQRSV) can be defined as QRS amplitudes of the QRS complexes of less than 0.5 mV in all the frontal leads and less than 1.0 mV in all the precordial leads.¹ However, the remarks that

follow pertain both to electrocardiograms (ECGs) with LQRSV and to any attenuation of the QRS voltage based on the comparison of at least² ECGs, even if none of them satisfy the above-cited criteria for LQRSV. Occasionally, LORSV in the ECG may not have an apparent explanation: and thus, in normal subjects, it is considered a normal variant. Low ECG QRS voltage may be noted only in the limb leads (a frequent encounter), the precordial leads, or both. Low ECG QRS voltage in limb leads with normal QRS precordial amplitudes,² or LQRSV in limb leads with high QRS complexes in the precordial leads with poor R-wave progression ("Goldberger triad") ³ have been described in patients with dilated cardiomyopathy So , we have studied what the associated abnormality with low voltage ECG at tertiary health care centre.

How to cite this article: G Lokendranath, M Revati, S Srija, K A Praveen. A study of various associated abnormalities in the patients with low voltage ECG at tertiary health care centre. MedPulse International Journal of Medicine. July 2019; 11(1): 54-56. https://www.medpulse.in/Medicing

METHODOLOGY

This was a cross-sectional study carried out in the Department of Medicine during the one year period i.e. October 2017 to October 2018 in the patients who showed low voltage ECG at tertiary health care centre. During the one year period with written and explained consent there were 50 patients who showed low voltage ECG were enrolled for the study. All details of the patients like age, sex, BMI (Body Mass Index) noted. All of them undergone all routine testing and specific investigations to find out any associated abnormality like X-ray, 2-D echo thyroid function etc was done. Entered to excel. Data was analyzed by Excel software for windows 10.

RESULT

Table	I: Distribution of the patients as per the age				
	Age	No.	Percentage (%)		
	20-30	3	6		
	30-40	9	18		
	40-50	12	24		
	50-60	15	30		
	>60	11	22		
	Total	50	100		

The majority of the patients were in the age group of 50-60 were 30% followed by 40-50Were 24%, >60 were 22%, 30-40 were 18%, 20-30 were 6%.

Table	le 2: Distribution of the patients as per the se					
	Sex	No.	Percentage (%)			
	Male	34	68			
	Female	26	42			
	Total	50	100			

The majority of the patients were Male i.e. 68% and Female were 42%

Table 3: Distribution of the patient	s as per the associated
abnormalitie	s

Associated abnormalities	No.	Percentage (%)			
Pericardial effusion	17	34			
COPD	14	28			
H/o Recent MI	11	22			
H/o Hypothyroidism	5	10			
Morbid obesity (BMI>40)	3	6			
Total	50	100			

The most common associated abnormality was Pericardial effusion was 34%, followed by COPD in 28%, H/o Recent MI in 22%, H/o Hypothyroidism in 10%, Morbid obesity (BMI>40) in 6%.

DISCUSSION

Multiple myocardial infarctions may lead to LQRSV because of cancellations and diminished electromotive

force generation; LQRSV and QRS notches are seen in conjunction with severe post-myocardial infarction dysynergy.⁴ Infiltrative cardiomyopathies, a prototypical example being amyloidosis, may lead to LQRSV involving both the limb and the precordial leads,⁵ which occurs despite the marked cardiac hypertrophy or dilatation. Other infiltrative cardiomyopathies are reputed to be associated with LQRSV, but literature review does not provide relevant information. Myocarditis is associated with LQRSV attributed to the ailing myocytes,⁶ although extracardiac influences may also contribute to the LQRSV.7 Reduction of QRS voltage (not necessarily LQRSV) follows reduction of cardiac volumes due to various pathologies, hemorrhage, or hypovolemia ("Brody effect").8 This is probably the mechanism for the LQRSV in patients with Addison's disease, although pulmonary congestion and/ or peripheral edema (PERED) may contribute to LQRSV (vide infra).⁹ Pericardial effusion leads to LORSV, the mechanism purported to be that of a short-circuiting of the heart's potentials as they are transmitted to the body surface; however, the mechanism may be more complex and may include even the intrapericardial pressure, like in tamponade, as the primary reason, along with the inflammation.^{10,11}Patients with chronic obstructive lung disease may show LQRSV, particularly in the limb leads,¹² pneumopericardium,¹³ pneumomediastinum,¹⁴ and pneumothorax, particularly left sided,¹⁵ are associated with LQRSV. Pulmonary edema¹⁶ and bronchopulmonary "lavage" ¹⁷ result in LQRSV because of decreased lung impedance by way of increased water content.In our study we have seen that the majority of the patients were in the age group of 50-60 were 30% followed by 40-50 Were 24%, >60 were 22%, 30-40 were 18%, 20-30 were 6%. The majority of the patients were Male i.e. 68% and Female were 42%. The most common associated abnormality was Pericardial effusion was 34%, followed by COPD in 28%, H/o Recent MI in 22%, H/o Hypothyroidism in 10%, Morbid obesity (BMI>40) in 6%

CONCLUSION

It can be concluded from our study that the majority of the patients were in the age group of 50-60 and associated abnormality were Pericardial effusion , COPD, Recent MI, Hypothyroidism, Morbid obesity (BMI>40)

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Source of Support: None Declared Conflict of Interest: None Declared