

Original Article

Different Types of Cardiac Arrhythmias Shown In Holter ECG Monitoring of 100 Patients Studied in NICVD

Faruque M¹, Masum ASMHA², Siddiqui MMR³, Faruk MT⁴, Rahman F⁵, Iqbal MJ⁶, Uddin RSG⁷

Abstract

Ambulatory ECG monitoring is suitable for patients with symptoms which may be caused by arrhythmia such as palpitation, light-headedness, syncope or chest discomfort. Patients with symptoms occurring daily or almost daily or those who have syncope without warning may be evaluated with a 24 hour Holter monitoring.

Objective of this study is to determine incidences of various arrhythmias on 24-hour electrocardiographic Holter monitoring.

This retrospective cross-sectional descriptive study was carried out in the cardiology department of NICVD by reviewing the Holter monitoring report to study different types of cardiac arrhythmias. Adult patients of either gender, referred for Holter monitoring with symptoms of palpitation, dizziness and syncope were evaluated for arrhythmia.

The data analysis of the 100 patients who were studied, showed that there were 75 (75%) males and 25 (25%) females. 25% of patients were below 40 years whereas 75% were above 40 years of age. 67(67%) patients developed arrhythmia and others were normal. 38% report showed ventricular ectopic, 11% sick sinus syndrome, 5% ventricular tachycardia, 3% complete heart block. Supraventricular ectopic, atrial flutter, atrial fibrillation and Wolf Parkinson White syndrome each developed in only 1% of patients.

Twenty four hour Holter monitoring is an important investigation for evaluation of patients with palpitation, dizziness and syncope. Arrhythmias were detected frequently in both symptomatic and asymptomatic patients. One must be careful to avoid attributing a symptom to an arrhythmia until a close temporal relationship is demonstrated.

Keywords: electrocardiographic Holter monitoring, arrhythmia.

Introduction

Holter electrocardiographic (ECG) monitoring is frequently used to evaluate patients with various arrhythmias. Common cardiovascular complaints, which required Holter monitoring includes palpitations, syncope, dizziness and chest discomfort.¹ Prolonged ECG recordings is the most useful non-invasive method to record and quantify the frequency and type of an arrhythmia and correlate the arrhythmia with patient's symptoms.² A number of patients, who visit general physicians and emergency departments; including not only cardiology clinics, but also neurology clinics commonly have the symptoms of dizziness, syncope and palpitations.^{3,4} Patients should be assessed who need further evaluation and investigation. If arrhythmias are thought to be the cause of symptoms, the crucial information needed is the recording of an ECG during the time of transient symptom. Typical symptoms may occur with simultaneous documentation of a cardiac arrhythmia capable of producing such symptoms; this finding is most useful for diagnosis and treatment. If symptoms occur without any Holter ECG change, that symptoms are not due to rhythm disturbance. A patient may remain asymptomatic during cardiac arrhythmias documented on the recording. Most studies beginning in the 1970's

1. Corresponding Author: Dr. Md. Faruque
Professor of Cardiology
Anwar Khan Modern Medical College, Dhaka
2. Dr. Abu Shams Md. Hasan Ali Masum
Registrar, Department of Medicine
Anwar Khan Modern Medical College, Dhaka
3. Dr. Md. Mahmudur Rahman Siddiqui
Assistant Professor of Medicine
Anwar Khan Modern Medical College, Dhaka
4. Dr. Md. Tanveer Faruk
Lecturer, Department of Physiology
Marks Medical College, Dhaka
5. Prof. Dr. Fazlur Rahman
Professor of Cardiology
Bangabandhu Sheikh Mujib Medical University, Dhaka
6. Dr. Md. Jabed Iqbal
Junior consultant, Cardiology
Anwar Khan Modern Medical College, Dhaka
7. Dr. Rubayat Sheikh Gias Uddin
Assistant Professor of Medicine
Anwar Khan Modern Medical College, Dhaka

reported an increased risk of sudden cardiac death among post myocardial infarction patients, who had frequent premature ventricular depolarization or episodes of non-sustained ventricular tachycardia during ambulatory ECG monitoring.⁵

Syncope secondary to cardiac causes carries a one year mortality of 18-33%.⁶ Every patient with cardiac syncope should be investigated by 24-hour Holter monitoring. Holter monitoring is sixteen times more likely to be diagnostic for patients with cardiac syncope.⁷ Ambulatory ECG has led to many new insights, including an understanding of the mechanisms of sudden cardiac death, causes of syncope and the concept of painless ischemia.⁸ Gatzoulis et al. found that abnormal findings on 24-hour Holter monitoring are well correlated with potential bradycardia and/or tachyarrhythmia causes of syncope, in electrophysiological study of patients with undiagnosed syncope.⁹ This study was conducted to evaluate the incidence of arrhythmia on 24- hour electrocardiographic Holter monitoring.

Materials and Methods

This retrospective study is done by reviewing the Holter monitoring report to study different types of cardiac arrhythmias. One hundred Holter monitoring report of either gender were taken with symptoms of palpitations, syncope, dizziness and chest discomfort. Those with history of permanent pacemaker implantation were excluded. Patients were advised to maintain a log of symptoms during 24-hour Holter monitoring and to record any episode of palpitations, syncope and dizziness. The Holter monitoring reports were analyzed by cardiologists for arrhythmias and all findings were entered in study proforma. was analyzed by SPSS version 17. Descriptive statistics were used to calculate frequencies and percentages of different arrhythmias noted on Holter monitoring.

Result

This retrospective study is done by reviewing the Holter monitoring report to study different types of cardiac arrhythmias. The data analysis of the 100 patients who were studied, showed that there were 75 (75%) males and 25 (25%) females. 25% of patients were below 40 years whereas 75% were above 40 years of age. 67(67%) patients developed arrhythmia and others were normal. 38% report showed ventricular ectopic, 11% sick sinus syndrome, 5% ventricular tachycardia, 3% complete heart block. Supraventricular ectopic, atrial flutter, atrial fibrillation and Wolf Parkinson White syndrome each developed in only 1% of patients. 33% of the patients had no positive findings.

Table 1: Sex distribution of the patients. (n=100)

Frequency (Percent)	
Male	75 (75)
Female	25 (25)
Total	100 (100)

Table-II: Age distribution of the patients. (n=100)

Age distribution	Frequency (Percent)
<20	2 (2)
20-40	23 (23)
41-60	42 (42)
61-80	30 (30)
>80	3 (3)
Total	100 (100)

Table-III: Frequency of Arrhythmia in Holter monitoring. (n=100)

Arrhythmia	Frequency (Percent)
Yes	67 (67)
No	33 (33)
Total	100 (100)

Table-IV: Age distribution according to heart rate. (n=100)

Age distribution	Normal Heart Rate	Bradycardia	Tachycardia	Teachy-brady
<20 yrs	0	0	0	2
20-40 yrs	1	7	3	12
41-60 yrs	5	13	10	14
61-80 yrs	1	11	4	14
>80 yrs	0	2	1	0
Total	7	33	18	42

Table-V: Type of arrhythmias found. (n=100)

Type of Arrhythmia	Male (%)	Female (%)	Total
Ventricular Ectopics	27	11	38
SSS	7	4	11
SVT	3	4	7
VT	4	1	5
CHB	2	1	3
AF	1	0	1
Atrial Flutter	1	0	1
WPW	1	0	1
Normal	29	4	33
Total	75	25	100

Note: SSS -sick sinus syndrome, SVT- supraventricular tachycardia, VT- ventricular tachycardia, CHB- complete heart block, AF- atrial fibrillation, WPW- wolf Parkinson white syndrome.

Discussion

This study was designed to determine the value of 24-hour electrocardiographic monitoring in diagnosing specific arrhythmias as the cause for various cardiovascular complaints. It is well recognized that advanced age is an important factor for changes in the structure of the myocardium, thereby generating serious arrhythmias.¹⁰ In 100 symptomatic patients who underwent 24-hour Holter monitoring, 67% had documented arrhythmias and 25% of

patients were below 40 years whereas 75% were above 40 years of age. The observed frequency of arrhythmia was same as anyother studies performed. Hinkle et al.,¹¹ who found an incidence of 62% for ventricular arrhythmias (ventricular premature depolarizations, ventricular tachycardia and ventricular bigeminy) as compared to 43% in the study; the frequency of ventricular tachycardia was 3.2%, as compared to 5%, in the present study.

Zideset al. showed that no specific complaint or combination of complaints was more likely to predict a disturbance in rhythm. In their study, the overall incidence of arrhythmias was 53% and of major significant arrhythmias were 39%.¹² Lipski et al.,¹³ evaluated 55 patients with symptoms of syncope, dizziness and palpitations and they found a 55% incidence of cardiac arrhythmias. Tabatznik et al¹⁴ showed a 60% incidence of cardiac arrhythmias in his group of patients with a history of syncopal attacks. Similarly, his study showed a 68,5% incidence of cardiac arrhythmias in a group of 54 patients who experienced palpitations. In our study result frequency of arrhythmia was 67% which was very close to other study results. Zimetbaum et al.¹⁵, found most common arrhythmia was ventricular ectopic (36%), We have found ventricular arrhythmia in 38% cases which is very close to previous study.

Shabnam et al¹⁶ found most common arrhythmia is ventricular ectopics and arrhythmia is more common among patient with poorly controlled Diabetes and Ischemic heart disease. So every diabetic patient who are not well controlled must be evaluated for arrhythmia by Holtermonitoring.

24 hour Holter monitoring is an important investigation for evaluation of various arrhythmias and presenting cardiac complaints. Arrhythmias were detected frequently in both symptomatic and asymptomatic patients. Furthermore, significant arrhythmias were detected so frequently in both symptomatic and asymptomatic patients. Among the patients with non-specific symptoms, Holter monitoring has got a significant role, in the primary diagnosis of myocardial ischaemia or arrhythmia as a cause of such symptoms in elderly patients.

This study has a number of limitations. It was a retrospective study and the number of patients was rather small. We do not have follow-up data for outcome analyses for the patients.

References

- Crawford MH, Bunstein SJ, Dedwania PC, DiMarco JP, FerrikKJ, Garson A Jr, et al. ACC/AHA guidelines for ambulatory electrocardiography: executive summary and recommendations. A report of American College of Cardiology/American Heart Association Task Force on practice guidelines (committeeto revise the guidelines for ambulatory electrocerdiography). *Circulation* 1999; 100:886-93.
- Miller JM, Zipes DP. Diagnosis of cardiac arrhythmia. In: Braunwald E, Zipes DP, Libby P, Bonow R, editors. *Braunwald's heart disease: a textbook of cardiovascular medicine*. 7th ed. Philadelphia: Elsevier Saunders; 2004: 697- 712.
- Neuhoauer HK, Radtke A, von Brevern M, Lezius F, Feldmann M, Lempert T. Burden of dizziness and vertigo in community. *Arch Intern Med* 2008; 168:2118-24. Erratum in: *Arc Intern Med* 2009;169:89.
- Patel MJ, Khan NU, Samdani AJ, Furqan M, Hameed A, Khan MS, et al. Syncope: experience at a tertiary care hospital in Karachi, Pakistan. *Int J Emerg Med* 2008; 1:79-83.
- Huikuri HV, Makikallio TH, Raatikainen MJ, Perkiomaki J, Castellanos A, Myerburg RJ. Prediction of sudden cardiac death: appraisal of the studies and methods assessing the risk of sudden arrhythmic death. *Circulation* 2003;108:110-5.
- Ammirati F, Colivicchi F, Santini M. Diagnosing syncope in clinical practice: implementation of a simplified diagnostic algorithm in a multi centre prospective trial the OESIL 2 study. *Eur Heart J* 2000; 21:935-40.
- Farwell DJ, Sulke AN. Does the use of syncope diagnostic protocol improve the investigation and management of syncope? *Heart* 2004;90:52-8.
- Zipes DP, Wellens HJ. What we have learned about cardiac arrhythmias? *Cirulation* 2000;102:52-7.
- Gatzoulis KA, Karystinos G, Gialernios T, Sotiropoulos H, Synestos A, Dilaveris P, et al. Correlation of non-invasive electrocardiography with invasive electrophysiology in syncope of unknown origin: implications from large syncope data base. *Ann Noninvasive Electrocardiol* 2009;14:119-27.

10. Olivetti G, Melissari M, Capasso JM, et al. Cardiomyopathy of the ageing human heart. Myocyte loss and reactive cellular hypertrophy. *Circ Res* 1991;68:1560-568.
11. Hinkle LE, Carver ST, Stevens M. The frequency of asymptomatic disturbances of cardiac rhythm and conduction in middle aged men. *Am J Cardiol* 1969; 24:629-50.
12. Zeldis SM, Levine BJ, Michelson EL, Morganroth J. Cardiovascular complaints. Correlation with cardiac arrhythmias on 24-hour electrocardiographic monitoring. *Chest* 1980;78:456-61.
13. Lipski L, Cohen L, Espinoza J, Mot TM, Dack S, Donoso E, Value of Holter monitoring in assessing cardiac arrhythmias in symptomatic patients *Am J Cardio* 1976; 37:102-07.
14. Tabatznik B. Holter recording stakes out three clinical areas *Clill Trends Cardiol* 1976;6:6-7.
15. Zimetbaum PJ, Kim KY, Ho KK, Zebede J, Josephson ME, Goldberger AL, Utility of patient-activated cardiac event recorders in general clinical practice *Am J Cardiol* 1997;79:371-72.
16. Shabnam J Hoque, Zahurul A Khan, Md. Zahid Alam et al. Study on 24 hrs. Holtar ECG Monitoring in adult diabetic patients with arrhythmia. *Bangladesh Heart J* 2003;28-27.