ORIGINAL ARTICLE

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Heart Rate Recovery after 6 Min Walk Test In Postmenopausal Women- An Observational Study

Pallavi K. Ahire[1], Dr. Reshma Shete[2]

1. Intern, 2. Assistant Professor, Dept. of Cardiovascular and Respiratory Sciences, DVVPF's COPT, Ahmednagar.

ABSTRACT:

Background: The Background of Study: Abnormality in heart rate is commonly observed in pre and post-menopausal women. Recovery of the heart rate is early in post-menopausal women which influences there fatigue level. **Method:** It was a cross sectional study conducted on 40 pre and 40 post-menopausal women. Heart rate recovery was measured using pulse –oximeter and a 6minute walk test was taken for evaluation in which patients were asked to walk for 6 minutes and immediately, after 1 minute and 2 minute vitals Heart Rate measured. **Result:** It is concluded that statistically there is no significant difference in heart rate recovery in early and late postmenopausal women. But clinically there is abnormal heart rate recovery found in late postmenopausal women than the early post-menopausal women. **Conclusion:** Normal Heart Rate Recovery is observed in pre-menopausal women and abnormal Heart Rate Recovery found in postmenopausal women.

Key words: Heart rate recovery, Six minute walk test, Postmenopausal women

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CORRESPONDING AUTHOR

Miss Pallavi K. Ahire

DVVPF'S College of Physiotherapy,

Ahmednagar. 414111

E-mail: – ahirepallavi2731@gmail.com

Phone No: +91 9834826869

INTRODUCTION

Cardiovascular function declines with increasing age, though the complex interactions of age related physiological changes, disease and differing life styles make interpretation of the observed changes difficult[1].The incidence of coronary heart disease rises significantly after menopause. It has been hypothesized that cardio protective effect before menopause could be due to the effect of the natural hormone estrogen and the decreased cardiac autonomic activity among post-menopausal women might be due to the depletion of estrogen. Clinical evaluation of heart rate recovery (HRR) is being used as a prognostic tool for diagnosing cardiovascular diseases. HRR is mainly thought to be due to parasympathetic reactivation. A delayed decline in heart rate has been associated with an increased risk of cardiovascular mortality. At the end of the exercise a decrease of 15-20 beats per minute (BPM) in the first minute of recovery has been shown to be typical for a healthy person.[2]Different stages of Menopause(Johnson memorial health).

1. Per menopause: During this time, estrogen progesterone levels drops and women first begins to notice changes in the body like:
    - Hot flashes
    - Night sweats
    - Rapid heartbeat
    - Fitful sleep
    - Mood changes
    - Vaginal dryness
    - Urinary issue
2. Menopause: The technical definition of menopause is not having your period for 12 months.
3. Post menopause: When a full year has passed after your last period, you are officially in postmenopausal.

A low HRR value has constantly been observed to be a marker of increased mortality. The rapid deceleration of HR after exercise appears to reflect parasympathetic reactivation, providing a unique perspective regarding the health and function of the autonomic nervous system. An HRR <12 beats at 1min post-exercise has been proposed as a threshold to define an abnormal response.[3]It is concluded that post exertion heart rate recovery is closely related to the vagal tone modulation. Abnormal heart recovery is a simple and reliable tool to assess the decrease in vagal activity.[4] According to the New England Journal of Medicine; people whose heart rate recovery time is long are at a higher risk of death than people with shorter recovery times regardless of physical condition or other risk factors.[3] According to the National Emergency Medicine Association. Measuring heart rate recovery rates is one way to tell whether an exercise program is effective.[3] Heart rate recovery (HRR), the failure of the Heart rate to decline at 1 or 2 minutes post exercise, is associated with increased mortality.[6]Physical endurance is defined as the ability to maintain submaximal aerobic exercise for an extended time. Exercise training has been associated with improvement in cardiovascular capacity in older people but, whether exercise training influences HRR in older people is still unknown.[5] Patients suffering from various cardiovascular or respiratory conditions have a direct impact on their heart rate recovery post exercise. For instance idiopathic fibrosis (IPF) is a severe, progressive Interstitial lung disease.[7] The ability to better predict the outcome with exercise testing in patients with heart failure(HF) and left ventricular systolic dysfunction may prove extremely valuable in determining which patients are at increased risk.Hence, heart rate recovery is a significant predictor of mortality in patients with heart failure and patients with LVSD and maybe useful in better determining prognosis.[8] In chronic respiratory entities abnormal autonomic cardiac response could be a consequence of lower parasympathetic activations that plays a protective role.[9]The six minute walk test (6mwt) is a simple, submaximal, objective and reproducible measurement of functional capacity. The time-distance walk was first introduced by Balke in the 1960's as a straightforward and objective measure of functional capacity.[10] The test simply required a patient to walk as far .

as they could in a set period of time with the primary outcome measure being the total distanced walked in the time allotted.[10] Cooper modified it into a 12 minute walk test. In 1892 Butland and colleagues compared two, six and twelve minute walk tests and determined that the 6 minute walk test is strongly correlated with 12 minute walk test.[10] The 6 minute walk test was widely used in many test centers on a patient with chronic respiratory disease and respiratory failure. In 1985 it was first introduced in patients with heart disease by Guyatt et al. The 6MWT is often used at the beginning of the rehabilitation programs to determine patients' exercise capacity and at the end to assess the degree of improvement and success of the program. As aerobic fitness improves for the person, The heart rate recovery must also improve .[11]

METHODOLOGY:

Research setting- Physiotherapy OPDDr. Vitthalrao Vikhe Patil Memorial Hospital.

Research design- Cross sectional study.

Sampling method- Purposive sampling.

Sample size- 80

Inclusion criteria:

Postmenopausal women aged 40 to 65 years

Be at least 1 year post cessation of menses forearly postmenopausal women and at least 5 years post cessation of menses for late menopausal women, Not taking estrogen therapy.

Exclusion criteria:

Unstable angina during the previous month

Myocardial infarction duringthe previous month.

Procedure-

The study was approved by the institutional ethical committee of DVVPF'S College of Physiotherapy,Ahmednagar.

The screening had done for menopause women based on the inclusion and exclusion criteria.

Participants had explained the proposed benefits, risks, and procedures involved in the study, in a language best understand to the individuals those who were fit in inclusion criteria & ready to participate in the study. Before the test the female had instructed to dress comfortably and wear appropriate footwear. The study began by instructed the females to sit for 15mins prior to the test in order to maintain a steady heart rate. Prior to the test the heart rate, blood pressure was recorded.Heart rate recovery was measured using pulse – oximeter and immediately, after 1 minute and 2 minutes.

Variables:-

Dependent Variable: Heart rate recovery.

Independent Variable: 6 minute walk test.

Outcome Measures: Herat Rate Recovery.

RESULT:

Unpaired t test is used to analyze the data and there were no significant differences were found in two groups.

Linear correlation:Number of points= 27, Correlation coefficient(r) = -0.1453. 95% confidence interval= -0.4979 to 0.2486, Coefficient of determination(r aquared)= 0.02110.

	GROUP A	GROUP B
Col. Title	Early menopause	Late menopause
Mean	14.45	10.97
Standard deviation (SD)	3.202	3.846
Sample size (N)	40	40
Std. error of Mean (SEM)	0.5063	0.6082
Lower 95% conf. limit	13.426	9.745
Upper 95% conf. limit	15.474	12.205
Minimum	8.000	4.000
Median (50th percentile)	14.000	12.000
Maximum	20.000	20.000
Normality test KS	0.1503	0.1551
Normality test P value	0.0233	0.0166
Passed normality test?	No	No

DISCUSSION:

We found that HR recovery time was more in late post-menopausal women as compared to early post-menopausal women. The specific reason for this might be hormonal imbalance and due to physiological changes in postmenopausal women this changes can also be associated with age related declined. Menopause is a physiological state which causes an alteration in cardiovascular parameters; change in heart rate is one important factor so the main aim of the study was to find out the heart rate recovery after six minute walk test in postmenopausal women. Hence we assess six minute walk test in early and late postmenopausal women, where we checked heart rate recovery.In our study, we found that 14.45 mean with 3.20 SD in early menopausal women whereas in late menopausal women we got 10.97 mean and 3.84 SD. The correlation coefficient r=-0.14 and the two tailed p value was <0.0001 which was considered extremely significant. In a study, by Rosano et al. it was found that predominant sympathetic activity in postmenopausal women decreased after estrogen replacement therapy for 4 months. Ribeiro et al. showed a decrease in HRV in postmenopausal women decreased in parasympathetic activity compared to young women on analysis of time domain measures of HRV.

CONCLUSION:

It is concluded that statistically there is no significant difference in heart rate recovery in early and late postmenopausal women. But clinically there is abnormal heart rate recovery found in late postmenopausal women than the early postmenopausal women.

CONFLICT OF INTEREST: The author declares no conflict of interest.

FUTURE SCOPE: Study can be carried out on a large scale with a large sample size.

FUNDING: This study was not funded.

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REFERENCES:

1.Herdy A, Fay C, Bornschein C, Stein R. Importance of heart rate analysis in exercise tolerance test. Revista Brasileira de Medicina do Esporte. 2003;9(4):252-256. SasikalaJ. et al. Heart rate recovery and lipid profile in Postmenopausal Women. NJBMS. Sep 2017;8 (1);46-50.

2. Brockbank C, Chatterjee F, Bruce S, Woledge R. Heart Rate and its Variability Change After the Menopause. Experimental Physiology. 2000;85(3):327-330.

3.Bjoraker JA,Ryu JH, Edwin MK, et al. Prognostic significance of histopathologics subsets in idiopathic pulmonary fibrosis. Am J Respir Crit Care Med. 1998;157:199-203.

4.Carroll S, Marshall P, Ingle L, Borkoles E. Cardiorespiratory fitness and heart rate recovery in obese premenopausal women. Scandinavian Journal of Medicine & Science in Sports. 2012;22(6):e133-e139.

5.Herdy A, Fay C, Bornschein C, Stein R. Importance of heart rate analysis in exercise tolerance test. Revista Brasileira de Medicina do Esporte. 2003;9(4):252-256.

6.Seshadri N, Gildea TR, McCarthy K, Pothier C, Kavuru MS, Laur MS (2004) Association of an abnormal exercise heart rate recovery with pulmonary function abnormalities. Chest . 125(4):1286-1291.

7.Balke B. A simple field test for the assessment of physical fitness. Rep Civ Aeromed Res Inst. 1963;53:1 -8

8.Swigris J, Swick J, Wamboldt F, Sprunger D, du Bois R, Fischer A et al. Heart Rate Recovery After 6-Min Walk Test Predicts Survival in Patients With Idiopathic Pulmonary Fibrosis. Chest. 2009;136(3):841-848.

9.Butland R, Pang J, Gross E, Woodcock A, Geddes D. Two-, six-, and 12-minute walking tests in respiratory disease. BMJ. 1982;284(6329):1607-1608.

10.Lipinski M, Vetrovec G, Gorelik D, Froelicher V. The Importance of Heart Rate Recovery in Patients With Heart Failure or Left Ventricular Systolic Dysfunction. Journal of Cardiac Failure. 2005;11(8):624-630.

11. Carroll S, Marshall P, Ingle L, Borkoles E. Cardiorespiratory fitness and heart rate recovery in obese premenopausal women. Scandinavian Journal of Medicine & Science in Sports. 2012;22(6):e133-e139.

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