

Research Article

EFFECT OF OXYGEN IN ELECTROCARDIOGRAM

*S. S. Sakhare¹ and B. H. Pawar²

¹P. R. Pote COET, Sant Gadge Baba Amravati University, Amravati, Maharashtra, India

²Sant Gadge Baba Amravati University, Amravati, Maharashtra, India

*Author for Correspondence

ABSTRACT

This paper presents the effect of oxygen on the wave forms generated by heart. The electrocardiogram (ECG) is a noninvasive test that is used to reflect underlying heart conditions by measuring the electrical activity of the heart. We record the ECG of human being at normal condition. Then person is seating inside the chamber. The oxygen inside the chamber can be increased by oxygen cylinder. Change in oxygen level can be measured by oxygen sensor. Then pranayama can be carried out for ten minutes at high oxygen level. Again record the ECG'S at different oxygen level. It is found that the ECGS becomes changes after Pranayama at different oxygen level.

Key Words: Electrocardiogram (ECG), Heart Rate, Oxygen Sensor, Pranayama

INTRODUCTION

Pranayama

In yogic terms prana means the vital energy and ayam means exercise. Pranayam defines the regulation of the in and out flow of this vital energy. It explains that the body, breath and the mind are intricately interwoven. When the air moves the mind moves and when the air is stilled the mind also could be stilled. Hence the various techniques employed in Pranayama are to stabilize the flow of air. All over the world, cardio-vascular disease imposes a significant morbidity and mortality. In spite of greatly improved diagnostic and curative cardiology, millions die of heart disease every year. In India, heart disease was relatively uncommon 50 years ago. However, there has been an alarming increase in pranayama is an ancient Indian science and its practice is known to improve and maintain health status by improving cardio-vascular, cardio-Respiratory and other functional capabilities and also prevent various ailments.

Electrocardiogram (ECG)

The electrocardiogram (ECG) is a noninvasive test that is used to reflect underlying heart conditions by measuring the electrical activity of the heart. By positioning leads (electrical sensing devices) on the body in standardized locations, information about many heart conditions can be learned by looking for characteristic patterns on the ECG. An electrocardiogram can tell a lot about your heart and how it is working. A healthy person's electrocardiogram has a certain pattern. When there are changes in that pattern, then there is a problem with your heart. For example, during a heart attack, the EKG machine records the changing pattern of the heart's electrical activity.

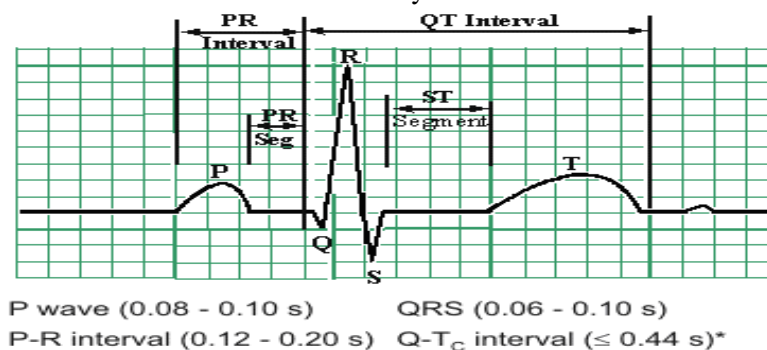


Figure 1: Human ECG signal over one Cardiac Cycle

Research Article

Heart rate

Heart rate is the number of heart beats per unit of time, typically expressed as *beats per minute* (bpm).

The *R wave to R* heart rate (HR) is readily calculated from the ECG as follows:

$HR = 1,500/RR$ interval in millimeters, $HR = 60/RR$ interval in seconds, or $HR = 300/\text{number of large squares between successive R waves}$. In each case, the authors are actually referring to instantaneous HR, which is the number of times the heart would beat if successive RR intervals were constant. However, because the above formula is almost always mentioned, students determine HR this way without looking at the ECG any further. Wave interval (RR interval) is the inverse of the heart rate.

MATERIALS AND METHODS

Present study was a case-control study. On detail history, all subjects were nonalcoholic, non-smokers, not taking any drug and were having similar dietary habits, physical and mental activities in working and home atmosphere. They were subjected to clinical examination and found healthy. Data on physical characteristics was obtained such as age, height, weight, diet, hemoglobin. The some normal human being where selected for study. ECG leads are attached to the body while the person lies flat on a bed or table. Leads are attached to pre-defined positions. A small amount of gel is applied to the skin, which allows the electrical impulses of the heart to be more easily transmitted to the ECG leads. First of all we record the ECG at normal condition. Then record the ECG. After some time, the person is seating inside the chamber. The oxygen level inside the chamber can be increased by oxygen cylinder. The oxygen level can be measured by oxygen sensor. Then same pranayama can be carried out for ten minute but at higher oxygen level. Again record the ECG. Lastly interpret ECG in different conditions.

RESULTS

There were 50 subjects above 30 years of age of both sexes. Study group included 20 subjects. Here we present result of two subjects. First ECG (shown in ECG 1) shows the effect of oxygen at low oxygen level of subject 1. Second ECG (shown in ECG2) shows the effect of oxygen at the high oxygen level of same subject. Third ECG (shown in ECG 3) shows the effect of oxygen at low oxygen level of subject 2. Fourth ECG (shown in ECG 4) shows the effect of oxygen at the high oxygen level of same subject. Lastly interpret ECG in different conditions. It found that the Heart rate is decreases in second ECG as compared to the first ECG. Also Heart rate is decreases in fourth ECG as compared to the Third ECG.

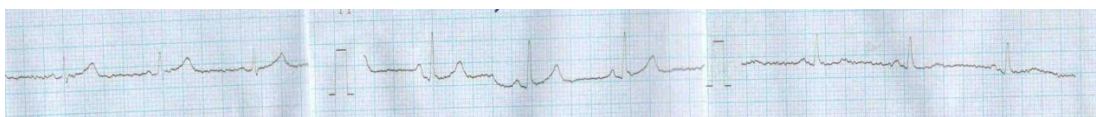


Figure 2: ECG 1 of subject 1 at low oxygen level

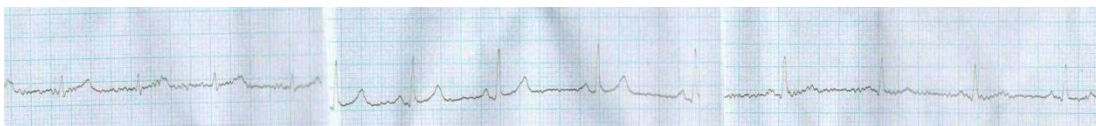


Figure 3: ECG 2 of subject 1 at high oxygen level



Figure 4: ECG 3 of subject 2 at low oxygen level

Research Article

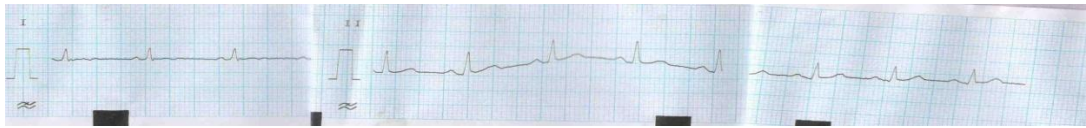


Figure 5: ECG 4 of subject 2 at high oxygen level

DISCUSSION

To the best of our knowledge no study has been carried out showing effect of pranayama on parameters at different oxygen level. Environmental conditions and variety of behavioral factors such as stress, anxiety, affective and attitudinal dispositions of the individual influence the cardiovascular responses. Pranayama involves physical, mental and spiritual task in a comprehensive manner. It brings about the behavioral changes. Pranayama in long duration affects hypothalamus and brings about decrease in the systolic and diastolic BP through its influence on vasomotor centre, which leads to reduction in sympathetic tone and peripheral resistance

CONCLUSIONS

A number of investigations indicate that change in heart rate has emerged as a new risk factor for mortality in homoeothermic mammals, particularly cardiovascular mortality in human beings. This can be avoided by increasing oxygen level. Pranayama at different oxygen level awareness resulted in changes in heart rate. Thus we have to maintain oxygen level in air and avoiding air pollution.

REFERENCES

- Anand BK, Chhina GS and Singh B(2004).** Investigations on yogis claiming to stop their heart beat. *Indian Journal Medical Research* **196** 90–94.
- Nathan W (2001).** Physiological aspects of aging in man. *Annu Rev Physiological*.
- Prasad KVV, Venkata Ramana Y, Murthy KJR and Reddy MV (2003).** Influence of intensive yoga training.
- Raju PS, Anil Kumar K, Reddy SS, Madhavi S, Gnanakumari K and Bhaskaracharyulu (2010).** Effects of yoga on exercise tolerance in normal healthy volunteers. *Indian Journal Physiol Pharmacol*.
- Rao Visweswara K Correlation (2008).** Rao VK, eds. Biostatistics. Jaypee Brothers Medical Publisher (P) Ltd.
- Tulpule TH and Tulpule AT (2006).** Method of relaxation for rehabilitation after myocardial infarction. *Indian Heart Journal*.