

## **ABSTRACT**

### **ANALYSIS OF HEART RATE VARIABILITY AMONG FEMALES WITH IRON DEFICIENCY ANEMIA AND CORRELATION WITH SERUM FERRITIN LEVELS**

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#### **BACKGROUND**

Iron deficiency anemia is considered as one of the most common and widespread nutritional disorder. The prevalence of iron-deficiency anemia varies very much between age groups, between the sexes, between economic groups, and estimates suggest that as many as three fourths of the world's population is affected by iron deficiency. Anemia is an independent risk factor for many adverse cardiovascular events in the general population. Heart rate variability (HRV) is a most commonly used method to know the effects of the autonomic nervous system on the heart and changes which occurs spontaneously in the heart rate. So when heart rate variability decreases it indicates an autonomic dysfunction. Currently, HRV is considered as a predictor tool to diagnose sudden cardiac arrest and arrhythmias.

#### **AIM**

To study the association between HRV parameters and Iron deficiency anemia in female population and to correlate with serum ferritin levels.

## **OBJECTIVE**

### **A. PRIMARY**

1. To compare the heart rate variability among female patients with iron deficiency anemia and normal female population.

### **B. SECONDARY.**

1. To estimate the serum ferritin among female patients with iron deficiency anemia and normal female population .
2. To correlate the heart rate variability with serum ferritin levels of female patients with iron deficiency anemia.

## **METHODOLOGY (MATERIALS& METHODS)**

The study was conducted as a cross sectional study comparing the heart rate variability among females with iron deficiency anemia and normal population in 18 – 45 years age group with Hemoglobin <12 gm% and serum ferritin <12ng/l, Complete blood count parameters (Mean corpuscular volume, Mean corpuscular haemoglobin, ,Mean corpuscular haemoglobin concentration, Red cell distribution width) showing low values than the normal range.(MCV-80-100femtolitres,MCH-27-32picogms,MCHC-32-36gms/dl , RDW-11.5-14.5%) and peripheral smear showing microcytic hypochromic anemia. Other forms of anemia ,infections ,inflammations ,HT,DM,structural heart diseases,pregnancy was excluded from the study. Statistical analysis was done using Unpaired student‘t’ test. Correlation was done by pearson’s rank correlation.

## **RESULT**

HRV parameters of time domain measures and frequency domain measures were included in the study. RestingHeart rate, Systolic blood pressure, Diastolic blood pressure, Haemoglobin, serum ferritin, MeanHeart rate, MeanRR(ms), SDNN(ms), RMSSD(ms), LF(nu), HF(nu), LF/HF ratio was measured and was found statistically significant with P value < 0.0001. SDNN, RMSSD, and HFnu, Mean RR was positively correlated with serum ferritin levels. Mean HR, LF nu, LF/HF ratio was negatively correlated with serum ferritin levels.

## **CONCLUSION**

The cardiovascular autonomic nervous system activity and functional status of the heart were evaluated in female patients with iron deficiency anemia using Resting Heart rate variability. This study concludes an autonomic imbalance as evidenced by decrease in SDNN, RMSSD which were indicators of parasympathetic and increase in LF and LF/HFratio in iron deficient individuals which showed sympathetic dominance of autonomic nervous system activity. So by using HRV analysis as a sensitive and non invasive tool, treatment can be started at the earliest and thus we can prevent the complications in iron deficiency anemia. Serum ferritin is used as a marker to diagnose iron store depletion at the earliest.

**KEYWORDS :Iron deficiency anemia, Heart rate variability, serum ferritin**