

## **INFLUENCE OF DEEP DIAPHRAGMATIC BREATHING ON HEART RATE VARIABILITY IN ISCHEMIC HEART DISEASE PATIENTS WITH DIABETES MELLITUS**

Nagaraja H S<sup>1</sup>, Anupama B K<sup>2</sup> Jeganathan P S<sup>3</sup> and Prabha Adhikary<sup>4</sup>

<sup>†</sup>Department of Human Biology, International Medical University, Kuala Lumpur, Malaysia,

<sup>#</sup>Faculty of Medicine, University College of Sedaya International, Kuala Lumpur, Malaysia,

<sup>\*</sup>Department of Physiology and <sup>4</sup>Department of Medicine, Kasturba Medical College, Mangalore, India

**BACKGROUND/AIM:** Heart rate variability (HRV) is a result of sophisticated regulation and reflects appropriate cardiac regulatory mechanisms and the ability of the cardiac structures to respond to them. This study sought to determine the HRV in ischemic heart disease patients with diabetes and the effect of deep diaphragmatic breathing on heart rate variability.

**METHOD:** For analysis of HRV, 1-minute deep breathing HRV test was used. Ischemic heart disease patients with diabetes were taught deep diaphragmatic breathing and were asked to practice this breathing technique for 1 year.

**RESULTS:** There was a significant decrease in HRV in patients who had ischemic heart disease [IHD] with or without diabetes. IHD patients had significantly higher HRV than IHD with diabetes and diabetic autonomic neuropathy. A significant improvement in HRV was observed in patients who practiced diaphragmatic breathing compared with noncompliant patients.

**DISCUSSION/CONCLUSIONS:** Thus, HRV decreases in IHD patients who have diabetes, with greater decrease in HRV with autonomic neuropathy indicating a severe autonomic imbalance. Regular practice of abdominal breathing improves HRV.

**Key Words:** Heart Rate Variability Ischemic Heart Disease Diabetes Mellitus