

Study of Hematological Parameters in Hypertensive Patients of B G Nagara

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Abstract

Original Research Article

Context: Hypertension is a major health problem worldwide. It can lead to cardiovascular disease. The pathophysiology of hypertension is multifactorial which is affected by parameters such as hematocrit, viscosity, and hypercoagulability of blood. Although studies have been done on hematological parameters in hypertensive patients in different parts of the world there are only few studies in Indian population in particular. Hence the present study was planned to assess the Hematological parameters like RBC count, Hb & HCT in Hypertensive patients of B G Nagara. **Aim:** This study was conducted to determine Hematological parameters like RBC count, Hb & HCT in Hypertensive patients of B G Nagara. **Settings and Design:** The present study was a cross sectional study consisting of 50 Hypertensive patients of B G Nagara. **Materials and Methods:** This study was conducted in the Hypertensive patients of B G Nagara, Nagamangala taluk, Mandya district, after the institutional ethical clearance and written consent from each participant. RBC count, Hb & HCT was determined. **Results:** The parameters thus recorded were analyzed for statistical significance using Students 't' test and $p < 0.05$ was considered the level of significance. RBC count, Hb & HCT were significantly decreased at ($p < 0.001^{**}$) in the Hypertensive patients of B G Nagara. **Conclusions:** The results of this study indicate that Hematological parameters like RBC count, Hb & HCT are decreased in Hypertensive patients of B G Nagara.

Keywords: RBC – Red blood cells, Hb- Hemoglobin & HCT- Hematocrit.

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INTRODUCTION

Hypertension is a major health problem worldwide. It can lead to cardiovascular disease [1]. The prevalence of hypertension in India is 23.10 % among men and 26.60% among women [2]. Prevalence of hypertension in South India was found to be 20% according to the CURES 2007 study [3]. Cardiovascular disease has become an important cause of premature death and disability in Sub-Saharan Africa [4 5]. HTN itself a consequence of increasing urbanization and an increasingly western lifestyle, exemplified by increasing obesity, higher salt intake, and a sedentary lifestyle. Another contributory factor to hypertension may be blood viscosity. Plasma and whole blood viscosity have been suggested as important determinants of arterial blood pressure [6] in those with hypertension. Nonetheless, it is possible that whole blood viscosity plays a part in the genesis of stroke and coronary artery disease and cardiac hypertrophy [7]. Of the factors contributing to whole blood viscosity, haematocrit, red cell aggregability, red cell rigidity, and plasma viscosity, haematocrit is thought to be the most important, being responsible for at least 70% of the contribution [8]. Thus, the hematological parameters

will give an insight to prognosis of the disease as well. There is very little data on the relationship between blood pressure and blood viscosity from Sub-Saharan Africa [9]. In addition, there are number of disputes in various studies with respect to variability of hematological parameters in patients with hypertension. The pathophysiology of hypertension is multifactorial which is affected by parameters such as hematocrit, viscosity, and hypercoagulability of blood. These factors vary the kinetics of blood flow acting as contributory risk factor for coronary artery diseases, stroke, and thromboembolism [10]. Although studies have been done on hematological parameters in hypertensive patients in different parts of the world there are only few studies in Indian population in particular. Hence the present study was planned to assess the Hematological parameters like RBC count, Hb & HCT in Hypertensive patients of B G Nagara

METHODOLOGY

The study was prior reviewed and approved by the Institutional ethical committee. Subjects were hypertensive patients attending medicine OPD in Adichunchanagiri Hospital & Research Center.

Hypertensive subjects having blood pressure >140/90 mmHg were included in the study [11]. Patients with any systemic illness like diabetes & on any medications were excluded from the study. Each patient gave a written consent before participating in the study. A sample size of 50 was calculated based on the results of a similar pilot study done.

1) Height – The standing height was measured in centimeters nearest to 1 cm with a measuring tape attached over a wall. While measuring the height, the subject removed their shoes and stand with their heels together.

2) Weight – Weight was measured in kilograms in empty bladder and empty stomach on a standardized digital weighing machine nearest to 0.1 Kg.

From each patient 2 ml of blood was withdrawn to which anticoagulant solution was added and fed into the ABX Pentra DF120 Hematology

Table-1: Hematological Parameters in the Hypertensive patients

Parameters	Hypertensive patients	P value
RBC count	3.79±0.59	<0.001
Hb	11.61± 0.32	<0.001
HCT	37.61± 0.78	<0.001

DISCUSSION

The present study showed that RBC count, Hb & HCT was significantly decreased at ($p < 0.001^{**}$) in the hypertensive patients. Sympathetic activity in hypertensive patients is responsible for an increase in renal afferent arteriolar constriction which in turn causes an increase in renin secretion. Increased renin circulation leads to sodium and water retention in the body, via the effect of angiotensin on aldosterone, which leads to hemodilution and may be the cause for low hematological Parameters in hypertensives [12-14]. The other probable mechanism responsible for decrease in hematological Parameters in hypertension may be reduced production of erythropoietin and resistance of the bone marrow to erythropoietin stimulation [15]. Hypertension if not treated promptly leads to cardiac failure [16]. Congestive cardiac failure may also cause a low hematological Parameters level due to hemodilution in later stages.

CONCLUSION

The findings of our study suggests that hematological parameters are decreased in Hypertensive patients

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analyser from Horiba Medicals Pvt Ltd. The RBC count, Hb & HCT is measured by an electronic impedance variation principle.

Blood pressure was measured by a mercury sphygmomanometer in supine position. Blood pressure was measured two times. The average of two readings was taken as correct systolic and diastolic blood pressure. Statistical analysis of the data obtained was done using Student-‘t’ test, and other relevant statistical tools.

RESULTS

The parameters thus recorded were analyzed for statistical significance using Students’ ‘t’ test and $p < 0.05$ was considered the level of significance. RBC, Hb & HCT was significantly decreased at ($p < 0.001^{**}$) in the subjects

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