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Relationship of waist hip ratio with selected Hematological parameters of middle aged males of Punjab

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Abstract
The objective of the study was to find out the Relationship of waist hip ratio with selected hematological parameters of middle aged males of Punjab. The study was conducted on middle aged males (aged 40 to 45 years) of Punjab. A total fifty (N=60) middle aged males of Punjab was selected as subject. All the subjects were selected from different region of Punjab having no medical history. These Subjects were selected in terms of cluster sample from the all the region of Punjab. The necessary data on selected hematological parameters (Hemoglobin, Red Blood Cell Count (RBC) and Hematocrit) were collected by administration of laboratory tests for selected hematological parameters. The tests were administered after giving them instruction and taking consent from the subjects. Hematological parameter test Were taken place after 8 to 10 hours of fasting. The data pertaining to each of the selected hematological parameters (Hemoglobin, Red Blood Cell Count (RBC) and Hematocrit) were examined by Person's Product Moment Correlation in order to observe the significant relationship, if any. The level of significance to test the hypothesis was 0.05. $P<0.05$. The analysis of the data revealed that there was insignificant negative relationship existed between Hemoglobin and Waist Hip Ratio. As coefficient of correlation in case of waist hip ratio and Hemoglobin was -0.05 which was less than the required value (0.25). p value (0.70) was more than significant value (0.05). In case of Red Blood Cell Count (RBC), there was insignificant relationship existed between Red Blood Cell Count (RBC) and Waist Hip Ratio. As coefficient of correlation in case of waist hip ratio and Red Blood Cell Count (RBC) was 0.23 which was less than the required value (0.25). p value (0.07) was more than significant value (0.05). It is also evident that there was insignificant relationship existed between Hematocrit and Waist Hip Ratio. As coefficient of correlation in case of waist hip ratio and Hematocrit was 0.03 which was less than the required value (0.25). p value (0.0001) was less then significant value (0.05). In other case it is evident that there was significant Positive relationship existed between LDL and Waist Hip Ratio. As coefficient of correlation in case of waist hip ratio and LDL was 0.99* which was more than the required value (0.25). p value (0.82) was more than significant value (0.05). On the basis of finding of the study it was concluded that there was insignificant relationship of waist hip ratio with Hemoglobin, Red Blood Cell Count (RBC) and Hematocrit of middle aged males of Punjab. It shows low association between waist hip ratio and Hemoglobin, Red Blood Cell Count (RBC) and Hematocrit.

Keywords: Waist hip ratio, haemoglobin, red blood cell count (RBC) and Hematocrit

Introduction

Obesity is defined as an excess body fat resulting from a chronic imbalance between food intake and energy expenditure, (Hubert *et al*. 1983) [11]. It is a rapidly growing health problem in both developed and developing countries. From the clinical point of view, visceral adipose tissue is known to generate diabetogenic substances (DeFronzo, 2004) and may provide more information than total fat for diagnostic evaluation. Visceral obesity which is approximated by Waist Circumference (WC) or Waist-Hip Ratio (WHR) is typically seen in overweight and obese men. It is closely linked with insulin resistance, hypertension, and dyslipidemia, and causally related to increased risk of type 2 diabetes mellitus (DM) and cardiovascular disease, (Kahn and Flier, 2000). The various risk factors for the development of type 2 DM are obesity, ethnicity, sedentary lifestyle, sex, family history, hypertension, and smoking. However, there is now overwhelming evidence from experimental, epidemiological and intervention studies that obesity is a major risk factor for Type 2 DM among all risk factors.

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High Waist Circumference (WC), Waist-Hip Ratio (WHR), Body Mass Index (BMI) and age are risk factors as well as predictors of type 2 DM. The higher risk of type 2 DM in males with a high WHR and WC has been attributed to increased visceral fat accumulation. Among various anthropometric measurements used to measure the obesity, WC and WHR have been used as measures of visceral obesity whereas BMI as general obesity, (Molarius and Seidell, 1998) Hematology is a branch of medicine concerning the study of blood, the blood-forming organs, and blood diseases. The word "heme" comes from the Greek for blood. Hematology is the study of blood and blood disorders. Hematologists and hematopathologists are highly trained healthcare providers who specialize in diseases of the blood and blood components. These include blood and bone marrow cells. Hematological tests can help diagnose anemia, infection, hemophilia, blood-clotting disorders, and leukemia. Hematology is the science or study of blood, blood-forming organs and blood diseases. In the medical field, hematology includes the treatment of blood disorders and malignancies, including types of hemophilia, leukemia, lymphoma and sickle-cell anemia. Hematology is a branch of internal medicine that deals with the physiology, pathology, etiology, diagnosis, treatment, prognosis and prevention of blood-related disorders. Hematologists focus largely on lymphatic organs and bone marrow and may diagnose blood count irregularities or platelet irregularities. Hematologists treat organs that are fed by blood cells, including the lymph nodes, spleen, thymus and lymphoid tissue. Hematology tests include laboratory assessments of blood formation and blood disorders.

Full blood count: A count of the total number of red blood cells, white blood cells and platelets present in blood.

Blood film: Blood is smeared over a glass slide that is stained with specific dyes and viewed under a microscope. The number, shape and size of blood cells and the presence of any abnormal cells or immature cells are noted. The stain used for reticulocytes or immature red blood cells is Heilmeyer's reticulocyte stain. Staining may flag up abnormally shaped red blood cells such as sickle cells or spherocytes. Staining may also detect blood parasites such as malaria, toxoplasmosis, and microfiliariasis.

Anatomy of blood
Blood is made up of several parts, including red blood cells, white blood cells, platelets and plasma. Red blood cells, which make up about 45% of whole blood, carry oxygen from the lungs to the body's tissue. They also carry carbon dioxide back to the lungs to be exhaled. They are disc-shaped, and produced in the bone marrow. White blood cells, which are also made in the marrow, help fight infection. Together with platelets, they make up less than 1% of whole blood. Platelets are small, colorless fragments that stick together and interact with clotting proteins to stop or prevent bleeding. They are also produced in bone marrow. Plasma is the fluid part of the blood. Composed of 92% water, it also contains vital proteins, mineral salts, sugars, fats, hormones and vitamins. One of the most common hematology tests is the complete blood count, or CBC. This test is often conducted during a routine exam and can detect anemia, clotting problems, blood cancers, immune system disorders and infections. Divya R, Ashok (2016), said that hypertension is one of the components related with stroke, congestive heart disappointment, heart or

kidney disappointment. Overweight and heftiness are the two most key determinants of wellbeing that prompts antagonistic metabolic changes incorporating increment in circulatory strain. The cell segments of blood add to the consistency and volume of blood, in this manner assuming an essential job in managing circulatory strain. Targets: To look at the hematological parameters and anthropometric pointers in hypertensive and normotensive guys. Materials and Methods: This was a medical clinic based case control think about which included 60 ordinary sound male subjects and 60 hypertensive male subjects. Circulatory strain was estimated in recumbent position by mercury sphygmomanometer. Hematological records were evaluated utilizing an autoanalyzer. The information gathered were entered and dissected utilizing programming Statistical Package for the Social Science 16.0 (SPSS 16.0). Results and Discussion: The mean dimensions of hemoglobin and hematocrit were essentially lower in the hypertensive gathering contrasted with the normotensives in our investigation. The anthropometric estimation midsection hip proportion, demonstrated a measurably huge positive relationship with systolic pulse. Different relapse investigation demonstrated midsection hip proportion, hemoglobin and hematocrit were critical indicators of systolic circulatory strain. End: The present examination infers that Waist hip proportion; a straightforward and cheap anthropometric estimation can be utilized as a noteworthy indicator of systolic pulse. Likewise observing of hematological files like hemoglobin and hematocrit is basic in the aversion of improvement of cardiovascular entanglements in hypertension.

Methods
Subjects
The study was conducted on middle aged males (aged 40 to 45 year) of Punjab. A total fifty (N=60) middle aged males of Punjab was selected as subject. All the subjects were selected from different region of Punjab having no medical history. These subjects were selected in terms of cluster sample from the all the region of Punjab.

Hypothesis
On the basis of different research findings, expert's opinion and scholar's own understanding of the problem, it was hypothesized that-
1. There would be significant relationship of waist-hip ratio with hemoglobin level of middle aged males of Punjab.
2. There would be significant relationship of waist-hip ratio with Red Blood Cell Count (RBC) of middle aged males of Punjab.
3. There would be significant relationship of waist-hip ratio with hematocrit of middle aged males of Punjab.

Criterion measures
The following were the criterion measures for this study
1. **Hematological parameters**
    The red blood cells, hematocrit and hemoglobin were measured by the pathology expert of pathology lab by collection of the blood sample from the vein.
2. **Waist Hip ratio**
    This test was to determine the ratio of waist circumference to the hip circumference. A simple calculation of the measurements of the waist girth was divided by the hip girth. it was measured by the measuring tape.

Waist to Hip Ratio (WHR) = Gw / Gh,
Where Gw = waist girth, Gh = hip girth

Selection of variables

Table 1: Hematological parameters

Sr. No	Biochemical parameters	Tests	Unit of Measurement
1.	Red blood cell (RBC)	Laboratory test	million/µL
2.	Hematocrit	Laboratory test	Percent (%)
3.	Hemoglobin	Laboratory test	g/dl

Collection of data

Data was collected by administration of laboratory tests for selected Hematological parameters. The tests were administered after giving them instruction and taking consent from the subjects. The subjects were tested in the following way.

Hematological parameters: The administration of test was taken place after 8 to 10 hours of fasting.

Statistical analysis

The Person's Product Moment Correlation method was employed to test the significant Relationship of waist hip ratio with selected Hematological parameters of aged males of Punjab, The level of significance chosen to test the hypothesis will be 0.05, $P < 0.05$. Accordingly, a statistical software package (SPSS-17) will be used.

Analysis of data and result of the study

The statistical Analysis of data (Hemoglobin, Red Blood Cell Count (RBC) and Hematocrit) were collected from Sixty (N=60) middle aged male subjects of Punjab. The finding of the study and their discussions have presented below.

Level of Significance

The level of significance to check the R-value was set at 0.05 level which was considered appropriate for the purpose of the study.

Findings of the Study

The results pertaining to selected dependent variables have been presented in tables 2 to 4

Table 2: Relationship of waist hip ratio with hemoglobin of middle aged male peoples of Punjab

Variable	N	Mean	SD	Coefficient of correlation	P value
Waist hip ratio	60	1.1	0.029	-0.05	0.70
Hemoglobin	60	14.60	1.05		

Significant at.05 level N=60 df= 58, r_{tab}=0.25

Table 1 indicates that the mean and standerd deviation of the variable waist hip ratio and Hemoglobin were 1.10, 0.029 and 14.60, 1.05 respectively.

It is evident from table 3 that there is no significant relationship existed between Hemoglobin and Waist Hip Ratio. As coefficient of correlation in case of waist hip ratio and Hemoglobin was -0.05 which was less than the required value (0.25). p value (0.70) was greater than significant value (0.05).

Table 3: Relationship of waist hip ratio with red blood cells (RBC) of middle aged male peoples of Punjab

Variable	N	Mean	SD	Coefficient of correlation	P value
Waist hip ratio	60	1.1	0.029	0.23	**0.07**
RBC	60	5.28	0.47		

Significant at.05 level N=60, Df= 58, r_{tab}=0.25

Table 2 indicates that the mean and standerd deviation of the variable waist hip ratio and Red Blood Cells (RBC) were 1.10, 0.029 and 5.28, 0.47 respectively.

It is evident from table 4 that there is no significant relationship existed between Red Blood Cells (RBC) and Waist Hip Ratio. As coefficient of correlation in case of waist hip ratio and Hemoglobin was **0**.23 which was less than the required value (0.25). p value (0.07) was greater than significant value (0.05).

Table 4: Relationship of waist hip ratio with hematocrit of middle aged male peoples of Punjab

Variable	N	Mean	SD	Coefficient of correlation	P value
Waist hip ratio	60	1.1	0.029	0.03	0.82
Hematocrit	60	47.30	4.14		

Significant at.05 level N=60, Df= 58, r_{tab}=0.25

Table 4 indicates that the mean and standerd deviation of the variable waist hip ratio and Hematocrit were 1.10, 0.029 and 47.30, 4.14 respectively.

It is evident from table 4 that there is no significant relationship existed between Red Hematocrit and Waist Hip Ratio. As coefficient of correlation in case of waist hip ratio and Hemoglobin was 0.03 which was less than the required value (0.25). p value (0.82) was greater than significant value (0.05).

Discussion of Findings

Table 2 indicates that the mean and standerd deviation of the variable waist hip ratio and Hemoglobin were 1.10, 0.029 and 14.60, 1.05 respectively. It is evident from table 3 that there is no significant relationship existed between Hemoglobin and Waist Hip Ratio. As coefficient of correlation in case of waist hip ratio and Hemoglobin was -0.05 which was less than the required value (0.25). p value (0.70) was greater than significant value (0.05). Negative correlation did not show significant relationship but it indicates that high waist hip ratio will lead to decrease hemoglobin level in little extent.

Table 2 indicates that the mean and standerd deviation of the variable waist hip ratio and Red Blood Cells (RBC) were 1.10, 0.029 and 5.28, 0.47 respectively. It is evident from table 3 that there is no significant relationship existed between Red Blood Cells (RBC) and Waist Hip Ratio. As coefficient of correlation in case of waist hip ratio and Hemoglobin was 0.23 which was less than the required value (0.25). p value (0.07) was greater than significant value (0.05). Finding indicates insignificant relationship between waist hip ratio and Red Blood Cells (RBC). It may be due to that Red Blood Cells (RBC) production is based on the diet of the individual. Red Blood Cells (RBC) production occurs inside the bone marrow hence it is dependent on dietary factors of individual.

Table 4 indicates that the mean and standerd deviation of the variable waist hip ratio and Hematocrit were 1.10, 0.029 and

47.30, 4.14 respectively. It is evident from table 4 that there is no significant relationship existed between Hematocrit and Waist Hip Ratio. As coefficient of correlation in case of waist hip ratio and Hematocrit was 0.03 which was less than the required value (0.25). p value (0.82) was greater than significant value (0.05).

Discussion of Hypothesis
Based on the findings of the study, the hypothesis stated that-
1. There will be significant relationship of waist hip ratio with hemoglobin level of middle aged males of Punjab has been rejected.
2. There will be significant relationship of waist hip ratio with red blood cells count of middle aged males of Punjab has been rejected.
3. There will be significant relationship of waist hip ratio with hematocrit level of middle aged males of Punjab has been rejected.

Conclusions
On the basis of the findings and within the limitations of the study the following conclusions were drawn:
1. There was no significant relationship of waist hip ratio with hemoglobin level of middle aged males of Punjab. It shows very low positive association between waist hip ratio and hemoglobin level.
2. There was no significant relationship of waist hip ratio with red blood cells count of middle aged males of Punjab. It shows very low positive association between waist hip ratio and red blood cells count.
3. There was no significant relationship of waist hip ratio with hematocrit level of middle aged males of Punjab. It shows very low positive association between waist hip ratio and hematocrit.

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