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# EVALUATION OF HAEMATOLOGICAL PARAMETERS AMONG TRIBAL MENOPAUSAL WOMEN IN EASTERN INDIA

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**ABSTRACT** Studies reveal that haematological parameters vary with ageing process. Thus, the present study was carried out to examine the variation in white blood cell count, red blood cell count, haematocrit percentage, haemoglobin percentage in Tribal Menopausal women of Mayurbhanj, a tribal dominated district of Eastern India. A total of one hundred and eight tribal women participated in the study. They were divided into two groups. A test group of sixty-two post-Menopausal women (46 - 65 years) and a control group of women ageing between 20-35 years. Mean and standard errors along with T-test for comparison between control and test groups were carried out with Excel 2016. Results show that there is a significant difference in white blood cell count, haematocrit percentage, haemoglobin percentage at $p \leq 0.05$. There also exists a significant difference in the neutrophil and basophil count. The results suggest that anaemic condition is not prevalent in menopausal women. However, rise of neutrophil and basophil count is indicative of having underlying infections.

**KEYWORDS :** Haematological Parameters, Menopause, Haemoglobin, Haematocrit

## 1. Introduction

Menopause is an unavoidable phase in the life of a normal woman. This phase often fetch a lot of social, physiological, reproductive and psychological changes (Ali et al., 2014; Dosi et al., 2014; BO Eledo et al., 2017; Nansseu et al., 2016). During and after menopause, hormonal changes occur in female body which gets manifested in the form of different physiological and psychological changes.

Haematological parameters often indicate the health status of an individual as it often gets disturbed when an individual moves from one physiological stage to another (Obeagu & Obeagu, 2016). The blood parameters are also indicative of the prevalence of an infection, disease or other abnormalities in a living system. Hence, effects of habits like smoking, drinking, diseases like cancer, malaria, diabetes etc., can be well assessed by testing blood samples. Similarly, the physiological change like pregnancy, peri-menopausal changes and even menopausal changes can be well assessed from change in different blood parameters (Achie et al., 2011). Thus, the present investigation has been taken up to study the change in white blood cell count, red blood cell count, haematocrit percentage, haemoglobin percentage in women belonging to menopause group and compare with women in their reproductive age. The study was taken up among tribal women of Odisha, Since the data regarding the change in health status of tribal women are still lacking. Data is required to make appropriate policies and health care facilities for the elderly women which is very much required in these days, as their life expectancy is getting mounted. Now a days elderly women are spending almost one third of their lives in their menopause stage; hence we need to enhance their quality of life (Yanikkerem et al., 2012).

The current study was conducted on the tribal women of Mayurbhanj district of Odisha, India. The state of Odisha is having 62 tribal communities. Majority of the tribal people live in forest and hilly areas of the state. These people have suffered from educational and socio-economic backwardness due to geo-historical reasons from pre-independence time. However, after independence, tribes are given the scope of their socioeconomic and educational development. Emphasis has also been given to upgrade their health status (https://www.scstrti.in/index.php/communities/tribes). Hence, this piece of work has been taken up to study the health status of menopausal women belonging to tribal communities. Haematological parameters have been chosen for the evaluation process.

## 2. Materials and Methods

A cross-sectional study was conducted from the month of October 2018 to December 2019. The study was conducted after getting the approval of the Ethical Committee of Maharaja Sriram Chandra Bhanja Deo University, Odisha, India (Erstwhile North Orissa University), Odisha, India (IEC No.: NOU/IEC/017). Door to door visit in rural and urban areas were done. Women were told about the purpose of the study. After getting the written content the investigators carried out face to face interview on sociodemographic parameters. Authorized health personnel were requested to draw the blood by vein puncture from women under study.

### 2.1. Inclusion Criteria:

Women who confirmed that their menstrual cycle has stopped at least a year before the day of interview were grouped under test group and the women in the age group of 20 -35 years having regular menstrual cycle were kept under control group.

### 2.2. Exclusion Criteria:

Pregnant, lactating females, females with known cases of cancer, anaemia, tuberculosis, AIDS/HIV, cerebrovascular disease, coagulopathies, thyroid dysfunction, and medications known to affect the haematological values were excluded from the study.

### 2.3. Study of Haematological Parameters:

Women under study were made understood about the experiment and after getting their consent (both verbally and in written) blood samples (5 mL) were drawn by vein-puncture. Blood samples were then transferred into vials containing anticoagulants. These samples were analysed by using an Automated 5 Part Haematology Analyzer (HD Consortium India, MS4S2) for getting the values for Red Blood Cell Count (RBC Count), White Blood Cell Count (WBC Count), Differential White Blood Cell Count, Platelets Count, Packed Cell Volume, and haemoglobin percentage.

### 2.4. Statistics

All the statistics were carried out with Microsoft Excel -2016. Descriptive analysis was done for finding out the mean and standard deviation. Student's T – test was carried out for group comparison of the parameters.

## 3. Results

Table 1 shows the mean and standard error in different blood parameters between the Non – Menopausal (Control Group) and Post – Menopausal (Test Group) of tribal women. There is a significant difference in white blood cell count, haematocrit percentage, haemoglobin percentage at $p \leq 0.05$. There also exists a significant difference in the neutrophil and basophil count.

**Table1: Shows the variation in Blood Parameters Among Control (Non – Menopausal) and Test (Post-menopausal) Tribal Women of Eastern India**

| Blood Parameters | Control Group (n=46) Mean ± SE | Test Group (n=62) Mean ± SE | t-Value | P-Value |
|---|---|---|---|---|
| WBC Count ($m/mm^3$) | 7.09 ± 0.25 | 7.87 ± 0.19 | -2.45 | 0.015 |

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|---|---|---|---|---|
| RBC Count ($m/mm^3$) | 4.13 ± 0.22 | 4.45 ± 0.18 | -3.10 | 0.002 |
| Hct % | 37.88±0.47 | 41.16±0.59 | -4.05 | 0.000 |
| Hb gm% | 11.11 ± 0.17 | 12.13 ± 0.10 | -5.17 | 0.000 |
| Lymphocyte % | 19.45 ± 0.80 | 21.60 ± 0.73 | -1.98 | 0.054 |
| Monocyte % | 4.07 ± 0.23 | 3.99 ± 0.17 | 0.27 | 0.78 |
| Neutrophils % | 67.24 ± 0.88 | 64.28 ± 0.98 | 2.18 | 0.035 |
| Eosinophil % | 1.86 ± 0.25 | 2.06 ± 0.22 | -0.16 | 0.54 |
| Basophil % | 0.45 ± 0.03 | 0.36± 0.03 | 1.95 | 0.05 |

## 4. Discussion

Menopause is one of the inevitable physiological processes that every normal female undergoes. However, the beginning of this phase in women's life accompanies many physiological and psychological changes that affect the quality of life (Koert & Daniluk, 2010). Due to decline in estrogen level, bone density of women gets affected and many of them encounter osteoporosis, cardiovascular problems, urinogenital and sex-related difficulties (Kumar & Kumar, 2002). Likewise, anxiety, depression, irritation, forgetfulness, mental and physical exhaustion are some of the common psychological problems associated with menopause. A lot of research has been carried out in many countries to do early diagnosis of the physiological and psychological problems that acompanies with menopause (Khatoon et al., 2018; Rahman et al., 2010).

Haematological investigations are some of the basic investigations which were done to assess the state of anaemia, infection, immune system in females undergoing menopause. In the present study, we have compared white blood cell count, red blood cell count, haematocrit percentage, haemoglobin percentage along with differential white blood cell count of women belonging to non – menopausal stage (still in their reproductive stage) with the women of menopausal stage. It has been found that there exists a significant difference in white blood cell count, red blood cell count, haematocrit percentage, haemoglobin percentage between the control and test groups (Table 1).

It has been reported that lymphocytes and neutrophils mediate numerous inflammatory pathways. This inflammation led to several kinds of chronic low-grade infection that gradually move towards the peak with an increase of age. In the present study we have also found the existence of a significant difference in neutrophil and basophil count. It may be associated with the fact that women in their menopause stage usually get frequent urinary tract and lungs infections (Reid et al., 2014).

Experimental reports reveal that Estrogen inhibit red blood cell formation and hence influence the amount of red blood cell in a woman. During reproductive period the amount of estrogen generally remain high and so the red blood cells tend to remains low. However, after attaining menopause, estrogen level drops and so the number of red blood cells increases (Aneke et al., 2016; Bódis et al., 2003; Mirand & Gordon, 1966). This phenomenon thus helps in the maintenance of both red blood cell count and retention of higher percentage of haemoglobin even in women having the risk of nutritional anaemias (Aneke et al., 2016).

In our study also we found the amount of red blood cell count, haematocrit percentage, haemoglobin percentage to be higher in menopausal women than their corresponding test group. Further, higher red blood cell counts along with higher haematocrit percentage and haemoglobin percentage point towards the fact that control group women are in their reproductive stage and hence undergoes regular menstrual cycle which leads to a substantial blood loss which does not happen in the women of menopausal group. Thus, women belonging to menopausal group show lesser incidence of anaemia and nutritional deficits (Aneke et al., 2016). Nevertheless, some women of menopausal group do undergo the problems of iron deficiency and anaemia which might be due to some pathological changes. Post – menopausal women are mostly vulnerable pernicious anaemia, ulcers, haemorrhoids etc. which involves internal bleeding and blood loss (Ridhi et al., 2018). Studies done by Eledo et al., 2017, on Nigerian women also showed similar findings as we found from our present study. The findings of this work is also close to earlier work done on neutrophil, lymphocytes, monocytes and eosinophils where a value of 66%, 31%, 2% and 1% were got for neutrophil, lymphocytes, monocytes and eosinophils respectively (Eledo et al., 2015). Similar percentage of neutrophil, lymphocytes, monocytes and eosinophils were also shown to be present in the Nigerian menopausal women (BO Eledo et al., 2017).

## Conclusion

Tribal communities of India have been considered to be one of the socioeconomically and educationally backward classes. They still reside in the rural areas and are unaware of the problems and facilities provided by the Government and Non – Government Organizations for health-related problems. Hence, the study aimed at assessing the status of blood parameters of tribal menopausal women against pre-menopausal women. The findings of the study reveal that all the blood parameters of menopausal women are significantly higher than the non – menopausal women which suggests that during menopause due to decline in estrogen and cessation of menstrual cycle, the red blood cell formation and loss of blood due to menstrual cycle is low. This results in maintenance of preferred amount of RBC, haemoglobin percentage in menopausal women. However, further studies are required.

Further in our studies we found a difference in lymphocytes, neutrophils and basophils among the menopausal and non-menopausal women which indicates the presence of certain infection. Thus, these problems must also be taken care of otherwise there might arise certain chronic illness.

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