Introduction

Though pregnancy is a very physiological condition, it is capable of causing remarkable and dramatic changes in the hematological variables of the women. The hematological indices of an individual to a large extent reflect their general health. A pregnancy is influenced by many factors, some of which include culture, environment, socioeconomic status, and access to medical care. The hematological indices also have an impact on pregnancy and its outcome. The most common hematological indices are the indicators of hemoglobin concentration. Low hemoglobin in the blood is widely identified as a hematological abnormality and it associated with adverse pregnancy outcome. Physiologic anaemia is the term often used to describe the fall in hemoglobin concentration that occurs during normal pregnancy results from increasing plasma volume above normal by the end of gestation although the red cell masses itself increase by some and still leads to a fall in hemoglobin concentration with a feature of normocytic and normochromic type of anaemia. Anaemia in pregnant women is variously defined with two common parameters either as hemoglobin concentration less than 11.0 gm/dl or 5th percentile of the distributions of hemoglobin concentration or haemotocrit in a healthy reference population in nonpregnant women and lower in the pregnant group. The mean total leucocytes was higher in pregnant group and lower in control group.

Conclusion

Normocytic normochromic type of anaemia is observed among the pregnant women along with leucocytosis and thrombocytopenia.

Material and methods

This cross sectional study was undertaken in Fakhruddin Ali Ahmed Medical College, Barpeta, Assam. 60 otherwise healthy pregnant women in third trimester were taken as cases and another 60 non pregnant healthy women of 18 to 32 years were taken as control group after taking proper consent. All the study subjects included in the study were not suffering from any infectious disease at the time of examination. The first group which served as the test group presented themselves at the obstetrics and gynecology OPD of the institute for antenatal care. The second group which served as control comprised 60 nonpregnant women randomly selected from the student population in Fakhruddin Ali Ahmed Medical College, Barpeta. The study proposal was approved by the institutional ethics committee.

Results and observations

Results for the hematological indices were recorded. Results obtained from the haematological screening and questionnaire for the study was designed to suit the study. It comprised two sections of demographic/personal variables and information relating to their pregnancy/medical history which helped the researchers to exclude the subjects who are having any medical problems that may deviate the findings towards abnormal side. With the help of the nurses on duty 150, (75 from each group subject and control) blood samples were collected intravenously using standard procedures. Following the analysis of the questionnaire presented by the research participants in the test group, 60 persons met the minimum requirement in the test group which disqualified smokers and participants who had had a series of pregnancy complication and heavy alcohol consumption. From the control group samples 60 samples were accepted for further analysis. At the end of the sorting, blood samples was immediately taken to the automated haematological analyzer and the various results for the haematological indices were recorded. Results obtained from the haematological screening and questionnaire were analyzed using the data tool pack of Microsoft Excel 2007 and student’s T test was done to compare the findings between the two groups.

Results and observation

We observed that all the participants of both the groups were between the age of 19 to 24 years. Among the participants 26% were educated up to tertiary level and 38% up to secondary level and remaining 36% up to primary level. All the participants were belonging to rural area.

Tab 1- Comparison of Mean and standard deviation of different haematological parameters between both groups of participants.
Discussion

It was observed in the current study that mean hemoglobin level in the pregnant women is 9.20±1.55gm/dl, which is significantly lesser than the mean hemoglobin level of non pregnant group(10.95±1.55gm/dl), indicating prevalence of anaemia amongst the pregnant women. RBC count was certainly below the normal range in the pregnant group, which contributes to the lower values of the haemotocrit level and other absolute blood indices. From the result presented in Table 1, it was observed that there was a significant difference in the PCV of the test group when compared to the control. The decrease in PCV may be due to increase in plasma volume during pregnancy which causes haemodilution, and increased rate of infection especially malaria, hormonal changes, and conditions that promote fluid retention and iron deficiency. This decrease PCV is consisting with findings of some other previous studies [3,6,9]. MCV is within normal range amongst the pregnant women. The observation of significant variations in platelets count has also been observed in previous studies by Wahed et al[12].

Table-1 shows the comparison of the haematological parameters of the two groups in terms of mean and standard deviation. It was observed that haematological parameters in terms of hemoglobin level, RBC count, PCV, MCV, MCH and MCHC showed a significant decrease amongst the women with advanced pregnancy, in comparison to nonpregnant control group. This correlates with findings of other studies [3,4,5]. In the current study it was observed that the total leucocytes count was significantly higher in pregnant group as compared to that of control group, which is in consistent with the findings of Pitkin RM7 and Witte DL. Regarding platelet count there was no statistically significant difference observed between the two groups though there appeared a decrease level of platelet count amongst the pregnant women. The observation of significant variations in platelets count has also been observed in previous studies by Wahed et al[12].

Conclusion

Anaemia during pregnancy is common and has both maternal and foetal consequences. The most common cause is iron deficiency anaemia, other causes include infection, folate, and vitamin B12 deficiency [11]. About 95% of anaemia cases during pregnancy are due to iron deficiency. Typically, PCV is 30%, and MCV is <79fl. Decreased serum iron and ferritin and increased serum transferrin levels confirm the diagnosis [12]. It can be concluded that pregnancy in women alters haematological indices such as PCV, hemoglobin, leucocytes, and platelet counts along with other physical and chemical changes. Though this is said to be physiological, it is very much important to monitor these parameters during antenatal care to ensure healthy outcome and to rule out associated pathological condition and ensure early management if any.

References

[7]. Pitkin RM, Witte DL. Platelet and leucocyte count in pregnancy. JAMA 1979; 242(24): 2696-2699
[12]. By Lara A. Friel, MD, PhD, Anemia in Pregnancy. University of Texas Health-Southwestern Medical School at Houston