

**HAEMATOLOGICAL PROFILE AND ANEMIA ON WOMEN ATTENDING MASAM  
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**ABSTRACT**

**Introduction:** Anemia considered as a common problem and is one of the major nutritional deficiency disorders affecting a large part of population of both developing and developed countries. As a result of the lack of previous studies in the study area showing a haematological profile and the prevalence of anemia among women, this studies was performed in order to study the haematological profile and prevalence of anemia on women attending MASAM medical serves at Samno area. **Materials and methods:** Total 205 women were enrolled for this study. Blood samples were collected and by automated Mythic analyser were analysed for Complete Blood Count (CBC). Pretested questionnaire was used to collect general information. **Results:** the HB concentration on total women was  $(11.2 \pm 1.7 \text{ g/dl})$ . 82 (40.0%) were normal HB concentration  $(12.8 \pm 0.8 \text{ g/dl})$  and 123 (60.0%) were anaemic  $(10.1 \pm 1.3 \text{ g/dl})$ . RBCs, HCT, MCV, MHC and MCHC where statistically significant and the amount of WBC and platelets were not on anaemic group comparing to normal group. Out of total 205 women, 30% was fund to be mild anaemic, 63.4% moderate anaemic and 6.6% was sever anaemic. 121(59%) women weren't pregnant, and there HB was  $(11.6 \pm 1.8 \text{ g/dl})$  and 84 (41%) women were pregnant with HB concentration  $(10.7 \pm 1.5 \text{ g/dl})$ . HB, RBC,s and platelets count were significant decrease and WBCs count significant increased on pregnant compared to non pregnant women. However, there were no statistically differences for HCT, MCV and MCH between two groups. **Conclusion:** It can be concluded that pregnancy in women alters haematological indices such as hemoglobin, red blood cells, mean cell hemoglobin concentration, white blood cell and platelet counts and that during normal pregnancy.

**KEYWORDS:** Hematological indices, Pregnancy, Anemia, Hematology.**INTRODUCTION**

Anemia is defined as a decrease in the circulating red blood cell mass to below age and gender specific limits. Anemia is a common problem that is often discovered on routine laboratory tests. Its prevalence increases with age, reaching 44 percent in men older than 85 years. Normocytic anemia is the most frequently encountered type of anemia.<sup>[1]</sup> The anemia of chronic disease, is the most common normocytic anemia, found in 6 percent of adult patients hospitalized by family physicians.<sup>[2]</sup> In normocytic anemias, the mean corpuscular volume (MCV) is within defined normal limits, but the hemoglobin and hematocrit are decreased. The MCV is also age-specific.<sup>[3]</sup> With normal values ranging from 70 femtoliter (fL) at one year of age to 80 fL at seven years and older.<sup>[4]</sup> In normal pregnancy the haematological indices of an individual to a large degree reflect their general health.<sup>[5]</sup> and many studies such as,<sup>[6-7]</sup> have identified the haematological indices of the pregnant woman as one of the factors affecting pregnancy. Anemia is a widely identified haematological abnormality.<sup>[8]</sup>

**MATERIALS AND METHODS**

This study was carried out at MASAM medical serves from 2<sup>ed</sup> of March 2017 to 30th of July 2017. The blood samples were collected randomly from 205 women who were in a visit for routine laboratory investigation. All volunteers agreed to participate in the research, signed consent form and filled a short questioner. By the automated Mythik analyser, the collected specimen were analysed for Complete Blood Count (CBC) parameters, such as Haemoglobin (Hb), Red blood cells (RBCs), White blood cells (WBCs), Platelets count (PLT), Hematocrit (HCT), Mean corpuscular volume (MCV), Mean cell haemoglobin (MCH) and Mean corpuscular haemoglobin concentration (MCHC).

All the analysis was done using Microsoft Office excel 2013 and Windows based Minitab 16 statistical Package the generated data analysed into percentage, variant increase and decrease, mean and standard deviation were calculated. Paired t test were used to compare between two groups. P- Values <0.05 were taken as the level of significance.

**RESULTS**

The Complete Blood Count parameters were studied on 205 women volunteers. Their main age was  $32.4 \pm 9.1$

years and the haemoglobin concentration was  $11.2 \pm 1.7$  g/dl which was lower than WHO level 12 g/dl.

**Table 1: Haematological profile of 205 volunteers female.**

Parameter	Result	Parameter	Result
Haemoglobin (g/dl)	11.2±1.7	Hematocrit (%)	35.9±5.0
Red blood cells ( $10^6$ cells/mm <sup>3</sup> )	4.4±2.7	MCV (fl)	84.0±10.2
White blood cells ( $10^3$ cells/mm <sup>3</sup> )	7.7±4.3	MCH (pg/cell)	26.3±3.6
Platelets count ( $10^3$ cells/mm <sup>3</sup> )	288.8±83.6	MCHC (%)	31.1±2.6

In order to study the prevalence of anemia in Samon area, the women were divided in to two groups (According to WHO haemoglobin level), normal Hb concentration (Hb  $\geq 12$  g/dl) and abnormal Hb concentration (anaemic) (Hb  $< 12$  g/dl). 82 (40.0%) women were found to have a normal haemoglobin concentration ( $12.8 \pm 0.8$  g/dl) and 123 (60.0%) were

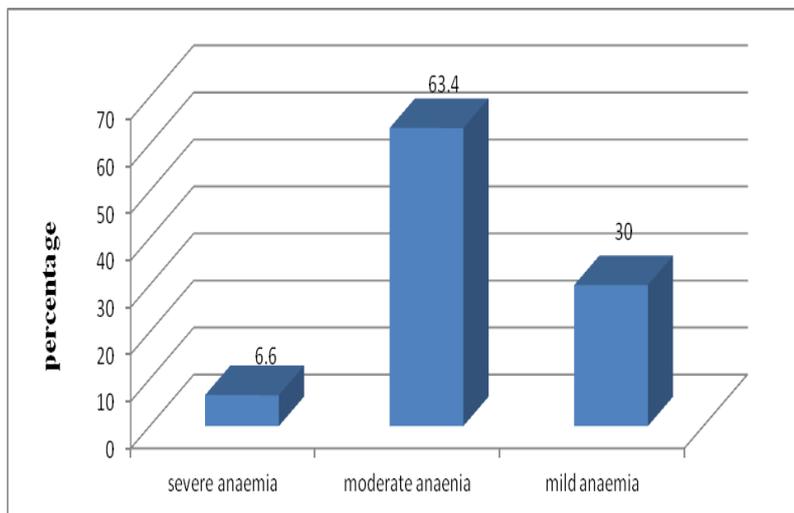
found to have a low haemoglobin concentration ( $10.1 \pm 1.3$  g/dl). The Hb concentration, RBCs, HCT, MCV, MHC and MCHC on anaemic group where statistically significant when were compared to normal group. However, there were no statistically differences in the WBC and platelets count on anaemic group comparing to normal group. These results are shown in Table (2).

**Table 2: Haematological profile of Normal and Abnormal (Anaemic) groups.**

Parameter	Normal group(82)	anaemic group(123)	P.V
Haemoglobin (g/dl)	12.9±0.68	10.1±1.3	0.001
Red blood cells ( $10^6$ cells/mm <sup>3</sup> )	4.5±0.4	4.0±0.5	0.001
White blood cells ( $10^3$ cells/mm <sup>3</sup> )	7.6±2.7	7.4±2.2	0.247
Platelets count ( $10^3$ cells/mm <sup>3</sup> )	288.9±77.3	292.3±93.9	0.778
Hematocrit (%)	40.4±3.01	32.83±3.57	0.001
MCV (fl)	89.02±7.31	80.6±10.5	0.001
MCH (pg/cell)	28.8±2.3	24.67±3.06	0.001
MCHC (%)	32.05±2.2	30.4±2.61	0.001

World health origination classified the degree of anemia in to: mild, moderate and sever anaemic. The result in

figure (1) shown that 30% was fund to be mild, 63.4% moderate and 6.6% was sever anaemic.



According to the date was collected from the questioner, the women were divided in to two groups, Non pregnant group (121- 59%) and pregnancy group (84- 41%).

Statistical analysis of results showed a significant decrease ( $P < 0.05$ ) in the Hb, RBCs, Platelet, MCHC ( $10.7 \pm 1.5$ ), ( $4.1 \pm 0.5$ ), ( $272.3 \pm 68.2$ ), ( $34.37 \pm 4.45$ ) respectively in the pregnant woman when compared to the non pregnant women ( $11.6 \pm 1.8$ ), ( $4.4 \pm 0.5$ ),

( $300.2 \pm 91.3$ ), ( $26.32 \pm 4.07$ ) respectively. The HCT ( $31.08 \pm 2.8$ ,  $31.07 \pm 2.2$ ), MCV ( $83.5 \pm 10.9$ ,  $84.77 \pm 9.27$ ), MCH ( $26.38 \pm 3.76$ ,  $26.32 \pm 4.07$ ) respectively, showed no significant difference between the pregnant and non pregnant women, while the total white blood cell count (WBC) showed significant increase ( $P < 0.05$ ) between pregnant women ( $8.7 \pm 6.1$ ) when compared to the non-pregnant women ( $7.0 \pm 2.3$ ). These results are shown in Table (3).

**Table 3: Haematological profile of pregnant and non pregnant women.**

Parameter	Non pregnant (121)	pregnant (84)	P.V
Haemoglobin (g/dl)	11.6±1.8	10.7±1.5	0.001
Red blood cells (10 <sup>6</sup> cells/mm <sup>3</sup> )	4.4±0.5	4.1±0.5	0.001
White blood cells (10 <sup>3</sup> cells/mm <sup>3</sup> )	7.0±2.3	8.7±6.1	0.015
Platelets count (10 <sup>3</sup> cells/mm <sup>3</sup> )	300.2±91.3	272.3±68.2	0.013
Hematocrit (%)	31.08±2.8	31.07±2.2	0.982
MCV (fl)	83.5±10.9	84.77±9.27	0.359
MCH (pg/cell)	26.32±4.07	26.38±3.76	0.924
MCHC (%)	36.98±3.07	34.37±4.45	0.001

## DISCUSSION

Anemia considered as a common problem and is one of the major nutritional deficiency disorders affecting a large part of population of both developing and developed countries.<sup>[5]</sup> Also, WHO reported that, about one-quarter of the world's population was affected by anemia,<sup>[9]</sup> Many factors such as gender bias, Poverty, and lack of education on the importance of intake of balanced play an important role in type and severity of anemia.<sup>[8]</sup>

The haematological indices also have an impact on pregnancy and its outcome individual to a large extent reflect their general health.<sup>[5-10]</sup> During pregnancy, the total blood volume increases by about 1.5 liters, mainly to supply the demands of the new vascular bed and to compensate for blood loss occurring at delivery.<sup>[11]</sup> Around one liter of blood is contained within the uterus and maternal blood spaces of the placenta. Increase in blood volume is, therefore, more marked in multiple pregnancies and in iron deficient states. Increase of plasma volume occurs by 10–15 % at 6–12 weeks of gestation.<sup>[12-13]</sup> The outcome of this study observed that, the Hb concentration of 205 women which were participate in this study was 11.2 ± 1.7 g/dl and 60% of them were anaemic. In the other study done by,<sup>[14]</sup> who founds that about 25% of black women between 20 and 49 y of age are anaemic. In our study, the prevalence of anemia and its association with pregnant women was evaluated among women attending the MASAM medical serves at Samno area were pregnancy group (84- 41%), anaemic. One of the latest studies that is most similar to our study is the one conducted in Ethiopia, which defined anemia according to the WHO criteria as (< 13 g/dl for men and < 12 g/dl for women), and found that the prevalence of anemia was 19%,<sup>[15]</sup> Our result showed a significant decrease ( $P < 0.05$ ) in the blood Hb, RBC, PLT, MCHC of pregnant women compared to the non pregnant woman.<sup>[16]</sup> While HCT, MCV and MCH showed no significant change between pregnant and non pregnant woman. Increased production of RBCs to meet the demands of pregnancy, reasonably explains why there is an increased MCV (due to a higher proportion of young RBCs which are larger in size). However, MCV does not change significantly during pregnancy.<sup>[16- 17]</sup> This observation is in line with our study. In the other hand total white blood cell count showed significant increase ( $P < 0.05$ ) in pregnant women compared to the non pregnant woman thus the observation of a significant increase in the total WBC count was disagreement with

the studies of,<sup>[6]</sup> who showed no significant difference. WBC is responsible for body defense during pregnancy. WBC was reported to be elevated in this study,<sup>[18]</sup> WBC increase occurring during pregnancy is due to the physiologic stress induced by the pregnant state.<sup>[17-19]</sup>

## CONCLUSION

In conclusion, our study showed that pregnancy has effects on haematological parameters (e.g., hemoglobin, platelet count, mean corpuscular hemoglobin concentration, red blood cells count, white blood cells count) and these alterations might be associated with a hemodilution, increased oxidative metabolism in neutrophils during pregnancy and physiologic stress induced by the pregnant state.

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