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HEMOGLOBIN LEVEL IN PREGNANT WOMEN: PREVALENCE, RISK FACTORS, AND IMPLICATIONS

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Abstract

Objective: *This study aimed to evaluate the level of haemoglobin among pregnant women in the Ittefaq Trust Hospital Lahore. There were two groups. One group included 20 women in the 2nd trimester, and the other group included 20 women in the 3rd trimester. In the 2nd trimester, 65% of women had low blood pressure, 20% had normal blood pressure, and 15% had high blood pressure. In the 3rd trimester, 70% of women had high blood pressure, 15% of women had normal blood pressure, and 15% of women had low blood pressure. The other parameter was the nutritional status of the pregnant women. Seventy-five percent of the women in the 2nd trimester had a low nutritional status, whereas 60% of the women in the 3rd trimester had a low nutritional status. The emotional status of pregnant women was the third parameter. Eighty-five percent of women in the 2nd trimester were stressed, whereas 75% of women in the 3rd trimester were stressed.*

Method: *The purpose of our study was to assess the level of haemoglobin among pregnant women during different trimesters. We visited the Ittefaq Trust Hospital Lahore and collected blood samples from pregnant women who were in different trimesters. Our questionnaire included questions related to blood pressure, nutritional status, hemoglobin level, emotional status and weight gain. Anaemia is a relatively normal finding in pregnancy.*

Conclusion: *Hemoglobin levels vary during pregnancy. Different parameters, such as nutrition, education and emotion, affect haemoglobin level, so we concluded from our research that haemoglobin levels were low in the second trimester and high in the 3rd trimester. Anaemia is very prevalent worldwide and occurs mainly during pregnancy.*

Results: *A haemoglobin level during pregnancy can be naturally lower than 10.5 g/dl, indicating normal anaemia during pregnancy.*

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INTRODUCTION

The hemoglobin of many species contains the same ratio of iron to protein and was discovered by Engelhard (1825). Four oxygen molecules are attached to the hemoglobin molecule of mammals. (Castanzoand, 2007). In different species, the order of amino acids in the globin protein in Hb is different. For example, in humans and chimpanzees, the sequences of hemoglobin are similar, but in the alpha and beta chains, only one amino acid is different (Hardison and Ross, 2012). According to the World Health Organization, anaemia is a situation in which the haemoglobin level in the blood is reduced (Jaleel et al., 2008). Pregnancy is initiated with a low iron rate in 40% of women. In pregnant women, the cause of anaemia is iron deficiency. A total of 1200 g of iron is needed per day for 55 kg of pregnant woman. Iron increases the mass of red blood cells and increases the growth of the foetus (Breymann, 2015). The nonprotein prosthetic hem group is attached to the protein chain. The protein chains are connected with each other in globin form, and each protein is present in an alpha helix structure. Iron is required for many processes in the body during pregnancy, and abnormalities in the fetus are due to iron deficiency (Steinberg, 2001).

Iron is required for many processes in the body during pregnancy, and abnormalities occur in fetuses due to iron deficiency (Geng et al., 2015). There are more chances of low birth weight, untimely birth of a child and, in some cases, death in utero in anaemic women (Roy and Pavord, 2018). During pregnancy, the haemoglobin level decreases because of an increase in plasma content. This situation results in placental perfusion with a decrease in blood viscosity (Mani et al., 1995). During pregnancy, variations in blood volume occur. The total blood volume ranges from 600-7000 mL because the volume increases to 100 ml/kg. The magnitude of plasma increases by 40%, and the number of red blood cells increases by 15-20% (Jansen et al., 2005). Hemoglobin consists of many subunits of globular proteins, and its structure is quaternary (Van Kessel et al., 2003).

Every woman is born at a specific time during gestation. She has to adapt to countless physical and structural changes in much less time. The fluid that surrounds the foetus in the amnion results from the enlargement of red blood cells and plasmatic bulk on the mother's side. This phenomenon is the reason that the ability of the junction between oxygen and blood is enhanced, facilitating the division of oxygen in tissue (Lee and Okam, 2011) Women have enough iron, but when the first trimester is near the end of pregnancy, a reduction in the level of haemoglobin begins. At the end of the second trimester, the haemoglobin level is the lowest. In the third trimester of pregnancy, there is a distinct increase in the Hb/lt ratio (11 g/dL). The red cell mass and plasmatic bulk vary, which reflects all these changes. (Milman et al., 2006).

Owing to maternal anaemia, newborn babies undergo premature birth. In addition, the chance of a low newborn weight increases (Abo-Saad and Fraser, 2012). During this stage, the number of red blood cells decreases, and the level of haemoglobin decreases (Candio and Hof meyr, 2007). Anemia is based on three different trimesters with different values of hemoglobin. The value of hemoglobin or rate of Hb changes during these trimesters. The rate of hemoglobin in the first trimester is 11 g/dL, that in the second trimester is 10.5 g/dL, and the Hb value in the 3rd trimester is the same, with 11 g/dL in the first trimester (MMWR et al., 1998).

Anemic disease is common in 41.8% of pregnant women and 30.2% of nonpregnant women worldwide. According to calculations of the World Health Organization (WHO), 56% of pregnant women in developing countries are anaemic. In particular, this percentage varies from 35% to 75%, and in developed countries, this percentage is 18%. Most pregnant women suffer from anaemia (Allen et al., 2000). In pregnant women, anaemia is present in approximately 41.8% of pregnant women, and its prevalence ranges from 5.7% in the USA to 75% in Gambia (Chat Thrunga et al., 2014). In some cases, females that are not pregnant also become anaemic (Goonewardene et al., 2012).

These ingredients, such as vitamin B2, iron, and folic acid, which are important for the production of hemoglobin and are responsible for anemia, are lacking (Sifakis and Pharmakids, 2000). In pregnant women, anaemia is associated with HIV/AIDS (Berer et al., 2002). The Hb concentration can be

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increased by regular iron supplementation. (Lee RL, 2005). Anaemia is a very serious health issue that affects 50% of pregnant women and 25% to 50% of the total population of the world. The nutrients, food, age, and status of pregnant women can affect haemoglobin levels (Ahankari et al., 2015; Johnson et al.,1994).

Worldwide, two billion people are affected by anaemia, which has become a health problem (World Health Organization, 2018). There is another role of pregnancy, which demonstrates that iron uptake is a challenge. A pregnant woman starts mineral drug intake at the 5th month of pregnancy. A total of 30% to 40% of pregnant women are anaemic. This shows that anaemia is very widespread. It causes considerable variations in pregnant women (Cortes et al., 2009). In pregnant women, if the amount of haemoglobin is 7 g/dl, anaemia is intense, but if the amount of haemoglobin is between 7 and 9.9 g/dl, anaemia becomes less common, and this disease is not severe when the amount of haemoglobin is 10–11 g/dL (Salhan et al., 2012).

Worldwide, people of all ages suffer from anaemia, but anaemia is widespread among pregnant women and among children aged 5 years, which is why anaemia is a serious societal issue (Balarajan et al., 2011). Overall, 11500 mothers die every year due to anaemia. Anaemia is also a cause of 591000 parinatal deaths in one year. (Salhan et al., 2012).

In pregnant women, if the magnitude of plasma and the number of red blood cells increase, then the hemoglobin concentration becomes diluted (Penelope, 2002). Iron deficiency anaemia is a type of anaemia. Numerous women suffer from this disease, but their condition is uniform. This disease causes a decrease in iron concentration, but over time, it converts into a disease called iron deficiency anaemia, which is very harmful and causes many disorders, such as malfunctions of many organs and physiologicals, and it also has a negative effect on metabolism (WHO/UNICEF/UNU, 2001). In Pakistan, 130 out of 250 women suffer from anaemia. Among these 138 women, 55 are lightly anaemic, and 83 suffer from a less severe type of anaemia. When the amount of haemoglobin in pregnant women increases, there is a greater chance of low-birth-weight newborns (Ijaz-ul-HT-Sohail et al., 2011; Garn and Steer, 2000).

Iron deficiency anaemia (IDA) is caused mainly by a lack of iron. This type of anaemia influences newborns, pregnant women and children (WHO, 2011). The reasons for anaemia are decreased production of RBCs, loss of blood and excess lysis of red blood cells. The decreased production of red blood cells is due to a lack of iron and a deficiency in vitamin B12. Injury and intestinal damage cause the loss of blood. Excess lysis of red blood cells is associated with many genetic diseases, including sickle cell anaemia and diseases caused by antibodies or lymphocytes naturally present in the body (Janz et al., 2013).

An investigation revealed that the important causes of anaemia in pregnant women are lack of guidance, social status, age and excess child birth. During pregnancy, dilution occurs in the blood of women, which causes a reduction in the level of hemoglobin. These variations occur in the blood circulatory system of pregnant women and involve considerable amounts of iron and folic acid; however, when these compounds are delivered to the fetus, they cause iron deficiency anemia and folic acid deficiency anemia in the mother. Anemia occurs in 20% of pregnant women and may include both type iron deficiency and folic acid deficiency anemia. (Shiro, 2009). During 20-24 weeks of pregnancy, the concentration of hemoglobin in the blood decreases due to the gain of fluid, and as the trimester changes, the level of hemoglobin also changes. (Malik et al., 2012).

Sixty-six percent of pregnant women are aware of anaemia, and 21% of their contributors are food with insufficient iron, the main reason for anaemia (Muhammad et al., 2012). Pregnant women need 4.4 mg of iron in one day, which shows that the iron requirement is very high, but in pregnant women, a lack of iron is very common (Milman, 2012). According to the National Health Survey of Pakistan, a disease called iron deficiency anaemia is present in 43-47% of people in the countryside and in 35-45% of people in cities (Mohydidin Maz, 1995). Maternal anaemia influences not only mothers but also unwanted results during pregnancy World Health Organization (WHO, 2015). During gestation, many problems occur if a

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lack of those chemical elements, which are required for normal growth and development, occurs, and this condition is also not good for the health of the mother (Christian, 2005).

During pregnancy, women can have better health if they use large amounts of those chemicals, which are required in trace amounts for growth and development of the body (Brough et al., 2010). Typically, in pregnant women, the amount of Hb decreases from 12.5-13.0 g/dL to 11.0-11.5 g/dL in the absence of iron intake (Rasmussen et al., 2005). Owing to anaemia, many diseases or deaths can occur in unborn babies and mothers during pregnancy (Fraser et al., 2009). In regions where thalassemia is widespread, a disease called sickle cell anaemia occurs, which causes a reduction in the level of haemoglobin. Hepcidin suppression is used for individuals who are carriers of thalassemia because they contain sufficient amounts of iron due to the production of red blood cells. Many problems occur if the amount of iron is very high (Jones et al., 2015). The concentration of hemoglobin decreases during the second trimester. The placental unit of the foetus needs a large amount of iron. Therefore, the requirement for iron is high (Alwan and Hamamy, 2015).

In progressing countries, anaemia is caused not only by a lack of iron. Other disorders, such as diabetes mellitus, tuberculosis and helminths, also cause this disease (McClure et al., 2014). Younger children are easy to produce; however, iron deficiency anaemia reduces this quality and reduces children's cognitive progress. In this way, this disease has a great influence on the progress of the country (Vivek et al., 2012).

Owing to a lack of iron and lack of folic acid, 20% of women are anaemic during pregnancy (Shiro, 2009). The state in which the number of red blood cells and their ability to transfer oxygen decreases, which is inadequate to fulfil the requirements of the body, is called pregnancy. These changes occur during pregnancy or with age, sex, etc. (Getachew et al., 2012). In pregnant women, if the amount of haemoglobin is high (14.5 g/dL), high blood pressure and psychological stress can occur (Jansen and More, 1997).

Aims and objective

The aim of our study was to investigate the effect of Hb among pregnant women. The biomarker on which we are more focused is hemoglobin. The purpose of our research is to assess different factors that cause anaemia, and the main asset is haemoglobin deficiency.

Materials and methods

We designed a questionnaire and conducted individual interviews. The purpose of our study was to assess the level of haemoglobin among pregnant women during different trimesters. We visited the Ittefaq Trust Hospital Lahore and collected blood samples from pregnant women who were in different trimesters. Our questionnaire included questions related to blood pressure, nutritional status, hemoglobin level, emotional status, weight gain, etc.

Method and procedure

We hired an experienced person who took the blood samples in the following steps. He cleaned the skin of the patient. The elastic band (tourniquet) was placed above the area to allow the veins to swell with blood. He inserted a needle into a vein (usually in the arm inside the elbow, called the brachial vein, or on the back of the hand). Three milliliters of blood was collected from each patient. The elastic band was removed, and the needle was removed from the vein. Then, the blood sample was placed into a vial or syringe. This method was repeated in 40 women, and 40 blood samples were collected for our research. We subsequently analysed these blood samples.

Procedure

We transferred 200 ml N/10 HCl into a microcentrifuge tube. A volume of 200 ml was equal to 2 ml in the hemometer tube. We collected 20 µl of blood via a micropipette. Then, we transferred the samples into N/10HCl-containing microcentrifuge tubes. We mixed blood and HCl. We waited for 5 minutes. Hb in the blood is converted into acid hematin, which is grown color. We transferred the solutions to a hemometer tube. Filled mark up to 2. We added distilled water dropwise and mixed it with a rod until the tube

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matched a brown color on the hemometer. We noted the result when the tube color matched the brown color of the tube. After the color matched, we read the lower meniscus. The reading that was observed was the concentration of hemoglobin in the given sample.

Results and findings

A total of 25% of women give birth to children with less weight, and 57% of these 25% of women aresfer from anaemia, as shown by recent research. In addition, 16.0% of women give birth to children with less weight in marahatta, whereas 63% of women in Bangalore do (Marahatta and Sangeatha, 2014). Uneducated women mostly suffer from anaemia during pregnancy in Ethiopia (Melku et al., 2014). Pregnant women who suffer from malaria or any other disease caused by parasites are likely to become anaemic (Mehanote et al., 2016). Anaemia is also caused by malariabecause of the increase in the breakdown of red blood cells (Naria et al., 2012).

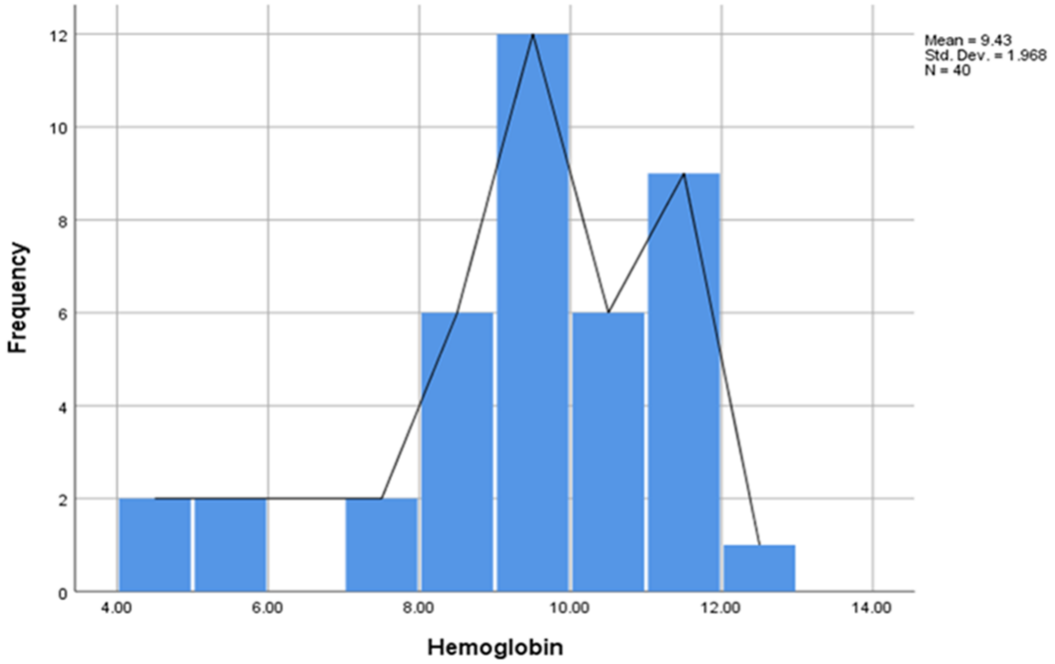

Figure 1: The graph shows the level of hemoglobin in 2nd trimester and third trimester of pregnancy. The level of hemoglobin is low in 2nd trimester and high in 3rd trimester.

Anemia causes disease and death of pregnant women .In progressing countries it is prevalent. Thewidespread presence of anemia and its related aspects are studied recently at ambiya health center. The mother and child both are affected by this. In republic of Korea the widespread presence of anemia is 30.2%but the widespread presence of anemia as a result of whole research at ambiya is 25.2% (van Bogart, 2006). It is investigated that in 2010 (50.9%) People were suffered from very intense anemia and 30.17%people had anemia which is not severe (Vijaynath et al., 2012). A pregnant women requires 4.4 mg of iron inone day. This shows that the requirement of iron is enhanced .But lack of iron usually occurs. It causes iron deficiency anemia more prevalent .In the beginning pregnant women take less amount of iron through food which is inadequate to fulfill the requirements of mother (Milman, 2012).

In progressing countries anemia is a serious issue and causes harmful effects during pregnancy. The aim of WHO is to protect and cure pregnant women from anemia. According to WHO, the anemia is not severe, when the level of hemoglobin is 10-10.9gm/dl. When the amount of hemoglobin is from 7-7.9gm/dl anemia is average but anemia is more intense when the concentration of hemoglobin is below 7mg/dl (Idow et al., 2005).

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Anemia during pregnancy has adverse effect on development of fetus. It also causes premature delivery and weight of baby is also reduced (Xiong et al., 2000).

During pregnancy if the he first suffered from anemia then in the first trimester there are greater chances of premature birth of baby. But in the third trimester these chances are further increased as compared to first trimester (Karasahin et al., 2007). Most of the women are suffered from anemia during pregnancy because they are not aware of the significance of food which is necessary for them (Agarawal and Meleant, 2009). In pregnant women with the passage of time the level of hepcidin is reduced. In the third trimester the hepcidin is reduced to minimum level (Van et al., 2013).

The transportation of iron from mother (Which she takes into the body by swelling) to baby is high when the concentration of hepcidin is low as compare to high hepcidin level. So, hepcidin is used as ameasureable substance whose presence is indicative of the level of iron transportation (Koenig et al., 2014). In Thialand it is investigated that anemia during pregnancy occurs due to thalassemia and IDA (Sukarat and Sirichotiykuls, 2006). The study from world health organization shows that when the concentration of hemoglobin during pregnancy is below 110g/l then it indicates anemia and causes premature delivery and escape of blood from ruptured blood vessel. It also causes other deleterious result. Many researches show that problem also occur in the pregnant women if the concentration of hemoglobin is greater (Tarim et al., 2004). The life time or the breaking of red blood cells and the low level production of red blood cells cause the disease known as anemia .The major component hemoglobin and the manufacturing of red blood cells is a complex process that can be influenced by many inherited and acquired conditions (Beutler, 2005).

Iron deficiency is the major cause of anemia during the conditions of pregnancy in the developed countries. The infections like malaria and other nutritional factors also occur at the same time with iron deficiency and women suffered from severe anemia. This type of severe anemia occur indifferent countries, where the maternal anemia is the most common disease (Yip and Eurr, 1997). The contraction of the plasma volume and the reduction in the mass of red blood cells produce the high concentration of the hemoglobin (Erslev et al., 2003). The hemoglobin level is increased by 10-15% in the most re-occuring or common disease that is acute dehydration .The blood volume enlarges by an average of the 50% in the normal pregnancy conditions as compared to the non-pregnant condition (Prichard et al., 2000).

In the first half of pregnancy, reduction in hemoglobin concentration occurs as a result of increase of plasma volume then red blood cell mass. This type of condition of is known as physiologic anemia of pregnancy. Smoking also causes decrease in weight of new born and promote maternal hemoglobin (Figure 1). In the first trimester quick enlargement of blood volume starts (Viteria and Garcia-Ibanez et al., 2000). New born babies whose mother inhale tobacco also has decrease in weight. No proof is found which describes that if the level of hemoglobin is high then it causes decreases in weight of baby (Krishnamurthys et al., 2000). The white women have high risk of adverse anemia with low concentration hemoglobin as compared to the black women with the less Hb concentration .But according to past research both the women have same concentration of hemoglobin (Perry and Johns et al., 1994). Maternal morbidity rate in anemic women is large which is proved by the recent study in India. The poor consequences of pregnancy and the bad effects on embryo are caused by the maternal anemia (Kalaviani et al., 2013).

Hemoglobin concentration and increase in weight of mother during pregnancy are improved through the better food, iron containing diet and awareness about the pregnancy, which is shown by recent study (Otoo, 2016). In pregnant women, iron containing food, better dietry plan, awareness of thepregnant women are the some successful plans to minimize the disease occurrence (Otoo, 2016). Consequences or issue in pregnancy and poor health problems of mother are caused by the deficiency of the elements that are required in trace amount (Christria, 2015).

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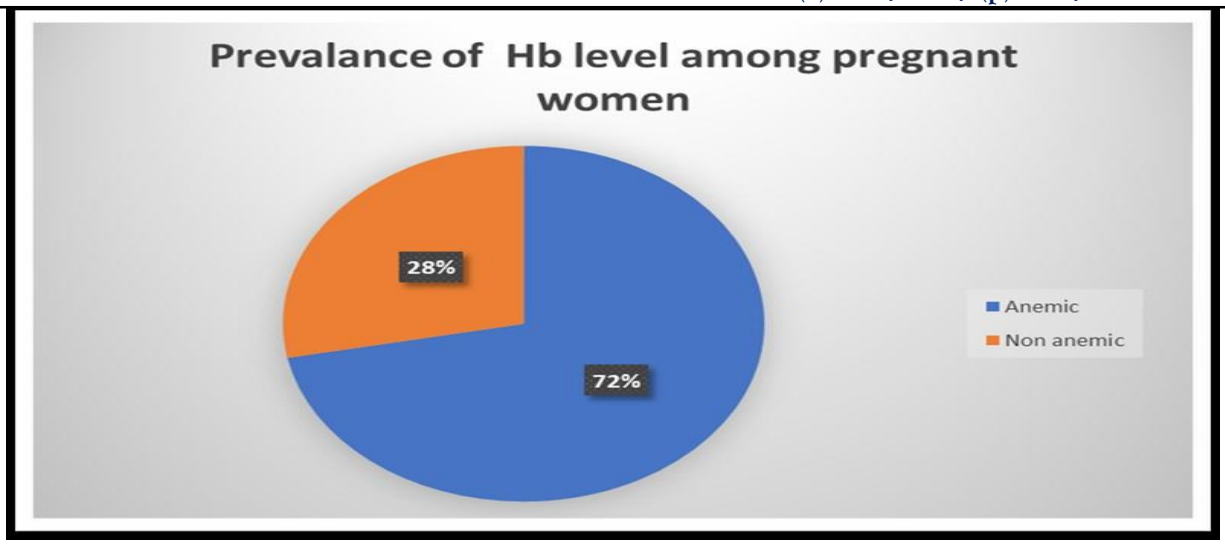

Figure 2: The graph shows the percentage of anemic and non-anemic pregnant women. The percentage of anaemic pregnant women is 72% while percentage of non-anemic is 28%.

During pregnancy blood volumes increase by 30% which mean women need more iron to make more hemoglobin. This is especially true during second and third trimester .When iron levels are low the red blood cells are enable to carry oxygen to the body tissue although it is normal to experience mild anemia during pregnancy due to increased blood volume. Severe anemia may put you and your baby at risk of premature delivery and low birth weight. Women who are pregnant are at higher risk for developing anemia due to excess amount of blood the body produces to help provide nutrients for the baby.

Iron deficiency may cause anemia by decreasing the capacity to carry oxygen by hemoglobin resulting in lack of oxygen in the mother and fetus. There is a lack of studies determining the potential contribution of iron deficiency to miscarriage. Nutritional iron deficiency is the commonest 90% cause of anemia in pregnancy. IDA is associated with increase maternal and perinatal morbidity and mortality, and long term adverse effect in new born. Pregnant women need iron to cover their basic losses, increased RBC mass and demand iron fetoplacental unit. The vitamin B12 and folate deficiencies in pregnancy are rare and may be a result of inadequate dietary intake with the latter being more common. These vitamins play important role in embryogenesis and hence any relative deficiencies may result in congenital abnormalities (Figure 2). The doze of iron could be reduced to 30mg for women who have no IDA. The aim is achieved of hemoglobin of at least 10gm/dl (Kalaviani et al., 2013).

Table 1: Independent T-test analysis for haemoglobin

		F	Sig.	T	df	Sig(2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
Hemoglobin	Equal variances assumed	7.102	.011	-7.129	38	.000	-2.94000	.41242	-3.7749	-2.1050
	Equal variances not assumed			-7.129	26.97	.000	-2.94000	.41242	-3.7862	-2.0937

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Independent sample test

This table indicates the comparison of variance between two groups. One group includes level of hemoglobin in 2nd trimester and other group includes level of hemoglobin in 3rd trimester of pregnancy. This shows significant difference between two groups and their equal of variance has not been accepted. So I assumed the value of variance is not equal. Independent sample test indicates significant value of hemoglobin in pregnancy. There are two hypothesis one is Ho and the other is Hu. In Ho the variation in hemoglobin level among two groups is same while in other hypothesis the variation in hemoglobin among two groups is not same. Since the calculated F value of hemoglobin is greater than table value 7.102>3.676. So, Ho is rejected. It means the variation in two groups is not same. The concentration of hemoglobin is high in 3rd trimester of pregnant women. The t value is -7.129. This shows significant difference among two groups. The t value is accepted because it lies in the start of curve before 3.076.So the level of hemoglobin is high in 3rd trimester of pregnancy (Table 1).

Discussion

We found that the level of hemoglobin in second trimester of pregnant women is low but it increases in the third trimester. The diet had great effect on the mother and baby. If the diet lacks iron and folic acid then it causes anemia in mother. If the mother is anemic then the baby is greatly affected. Anemia causes premature birth of baby and the infant has low weight. The parameters such as standard of living, nutritional status and socioeconomic factors have large impact on both mother and baby .If the pregnant women are educated they less likely to become anemic.

In the researches, the amount of iron uptake and the amount of iron released cannot be measured properly. But less knowledge is gained about iron concentration that the newborn releases or intakes after the delivery. In pregnant women, during second trimester the amount of HbA1C becomes less but during third trimester its amount becomes high like amount of Hb. Hb level becomes less and high during the second and third trimester respectively. In this way the pregnant women is suffered from anemia because expansion occurs in plasma and it becomes large then blood cells (Phelps et al., 2000).

Proper awareness is needed if a pregnant women is suffered from the disease in which amount of protein in urine becomes high .In this way GA becomes less (Okada et al., 2011). If the pregnant women has concentration of hemoglobin greater than 125g/L in the start than they have larger chances of GDM and PE as compared to those women who have concentration of hemoglobin less than 125g/L. It is studied by Mehrabian and Hosseini (2012). They studied about 973 pregnant women (Mehrabian et al., 2013).

Age of mother is a cause of maternal anemia. Anemia in mother also occurs if she does not go for check up on time. These factors also cause premature delivery and baby has less weight. It is shown by our study which is same as found in previous research. (Agarwal et al., 2006).

In India a research suggests that 17.9% out of 4450 pregnant women are suffered from anemia. Intense anemia occurs in 96 women and six are passed away (Mah-e-Munir 2011). A research on pregnant women shows that the chances of anemia increase if the women have low weight. This study has same results as found in early research (Bondevik, 2000). In progressed countries the presence of anemia is less because people are educated. They have advancement in the social and economic factors.

They use all the resources for the maintenance of health. The presence of anemia in the pregnant women increases if they do not have advancement in social and economic factors. In New Delhi a research shows that if increase occurs in earnings it decreases intense anemia (Gautam, 2002). During pregnancy, after the earlier stages if the pregnant women are suffered from iron deficiency anemia then it effects on the weight of new born and mother may also died (Pasricha et al., 2013). Pregnant women require good iron intakes. WHO provides guidance about the iron intakes during pregnancy and for the people where the abnormality in structure of hemoglobin is large (WHO, 2001). A research has occurred in Thialand and the sources of blood sample are pregnant women and the people who have good health. This

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research suggests that anemia during pregnancy occurs due to carriers of thalassemia (Sukrat, 2006).

A research by WHO shows that during pregnancy, women who suffered from less severe type of anemia are 59.7%. 33.3% women are suffered from average anemia and the remaining 7% women have intense anemia. But a research in India shows that the pregnant women who are suffered from less severe type of anemia are 27%, from intense anemia are 3% and those from average anemia are 33%. So these findings are less than the findings obtain from WHO (Sharma, 2013). If the miscarriages in a women increase then widespread presence of anemia becomes high. When miscarriages 0r abortion occurs then blood loss increases and blood also escapes from ruptured blood vessels. This condition reduces the amount of iron in the body. So the women need large amount of iron (Tadesse et al., 2017). A research by Rajamouli shows that 96.8% housewives and formers are suffered from anemia while the %age of anemia in jobholders' is 3.2% (Rajamouli et al., 2016). Premature birth among the black women is different from the white women both have same Hb level.

The black women having the Hb level lower than the average of 6.9g/l. During pregnancy the white women have high risk of adverse anemia as compared to the black women. Both women have low hemoglobin level according to the previous research (Perry et al., 2000). In Haryana a research in countryside has made that involves the women having pregnancy and their ages are 20-29 years. Out of them 70% above women are educated this is same to our research. According to our research, the percentage of women in the age of 19-24 year when she first time become pregnant is 80% but in the research of Mangla et al. (2016).

The percentage of women in the age 19-24 years when she first time became pregnant is 45% (Mangla et al., 2006). Our research suggests that in first trimester if the women become anemic it has great impact then when she becomes anemic in the second trimester of pregnancy. There is need to further study this because very little researches are made about this. When the women are in the first trimester of pregnancy she requires large amount of iron because in first trimester placenta is formed so iron is needed (Hamalainen et al., 2003).

Earlier study suggests that if the pregnant women are suffered from anemia than placenta is not formed in proper way and development is also decreased (Strowop and Rasmus, 2001).

Anemia has widespread presence in china due to presence of infection caused by hook worm .But for cities of shanghai this information is false (Qix et al., 2000). According to study anemia has widespread presence because of lack of iron in food. In British, if pregnant women have increased in level of hemoglobin in 10th week then they have decrease in the level of hormone that stimuli the activity of gonads and also lactogen of placenta (Wheeler et al., 2001).

In china a research has showed that if the women has better health during pregnancy then it decreases the chances of less weight of new born (Wen et al., 2000). In china those women who take food containing less concentration of vitamin c and iron are suffered from anemia (Xi-Hez, 1999).

The level of hemoglobin varied during pregnancy. The different parameters like nutrition, education and emotion etc. effected on its level so, concluded from research work that hemoglobin level was low in second trimester and high in 3rd trimester. The prevention of anemia, early detection and management strategies should be adopted. For assessment of needs of pregnant women, research study should be conducted Health can be improved by improving diet pattern of pregnant women.

Anemia is very much prevalent world-wide and it happens mainly during pregnancy. Hemoglobin concentration is significantly correlated with altitude, increasing with elevated altitude. BMI (underweight) and smoking are also significantly related to altitude with high anemic incidence rates at LA maternal age is directly related to anemia is common in illiterate females of poor population. Balanced diet with adequate meat products may reduce the risk of anemia among pregnant women.

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