FREQUENCY OF ANEMIA IN THE FIRST TRIMESTER OF PREGNANCY AND COMPARISON OF PHYSIOLOGICAL SYMPTOMS OF PREGNANCY AMONG ANEMIC AND NON-ANEMIC PATIENTS IN A PRIMARY HEALTH CARE CENTER: A COMPARATIVE CROSS-SECTIONAL STUDY.

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Abstract

Background & Objective: Anemia in pregnancy accounts for one-fifth of maternal deaths worldwide and is associated with high maternal morbidity, mortality, and adverse pregnancy outcomes. Pregnancy is associated with a variety of physiological symptoms, which can be distressing and need to be managed. Hence in this study, we aim to determine the frequency of anemia and compare the physiological symptoms in the first trimester of pregnancy among anemic and non-anemic patients.

Methods: A cross-sectional comparative study was conducted on women attending a rural health center in Pakistan for their first antenatal visit from January to November 2021. A formal interview of 801 eligible participants was conducted by the investigator to determine pregnancy-related symptoms and demographic data. Hemoglobin, and urine analysis reports were obtained from the hospital's laboratory. Data were analyzed using SPSS.

Results: The mean age of participants was 27.2 ± 4.6 years and mean Hb levels were 9.82 ±0.66 g/dl. The overall frequency of anemia was 96.5%. Majority were mildly anemic (71.5%), 5.9% were moderately anemic, and 0.3% were severely anemic. It was seen that anemic females experienced more symptoms in the first trimester compared to non-anemic females i.e. 492 (63.6%) vs 12(42.8%) respectively. Nausea and vomiting were the most common symptoms reported in 190 (23.7%) females. Heartburn was reported in 117 (14.6%), urinary tract infection (UTI) in 97 (12.1%), constipation in 39 (4.9%), backache in 33 (4.1%) and 28 (3.5%) women reported pelvic pain in the first trimester.

Conclusion: There was a high prevalence of anemia among pregnant women along with higher frequency of symptoms in the first trimester which calls for awareness and education in the community. The most common symptoms found in our population were nausea and vomiting, followed by heartburn and urinary tract infection.

Keywords: Anemia of Pregnancy; Vomiting in pregnancy; First trimester; Antenatal visit

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Anemia is a serious global public health issue faced by the healthcare system worldwide. It is defined as Hemoglobin (Hb) levels less than 11g/dl. It is established that almost 1.62 billion people are blighted by anemia, which amounts to 24.8 % estimated global anemia prevalence, out of which the pregnant women have an estimated anemia prevalence of 41.8 %. In Southeast Asia, the prevalence of anemia in pregnant women is 48.2%, which is the second highest prevalence in the world. In Pakistan, anemia is a moderate public health problem with a prevalence of 39.1%.[1] Anemia has direct correlation with the increased risk of maternal morbidity and mortality as well as low birth

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weight of the infants.[2] Women having moderate to severe anemia during pregnancy have a high infant mortality rate.[3] Severe anemia is associated with preterm births, resulting from both preterm labor, intra uterine growth restriction and spontaneous abortions.[4] Anemia has been found explicitly prevalent among pregnant women because of the needs of growing fetus. More than 80% of anemias diagnosed during pregnancy are iron deficiency anemias.[5] Majority of the pregnant women presenting to a healthcare facility for routine antenatal checkups report that they experience common symptoms of pregnancy which include nausea and vomiting, heartburn, leg cramps, low back/pelvic pain, constipation, varicose veins, edema and urinary tract infections. These symptoms are due to hormonal and physiological changes during pregnancy and often are troublesome for the expecting mothers, who frequently visit the healthcare facilities in search for interventions.[6]

Of all the aforementioned symptoms, mild nausea and vomiting, usually referred to as "morning sickness" is found to occur in more than 70% of pregnant women, typically during first trimester. Nausea and vomiting have a substantial effect on the lifestyle of pregnant women, often interrupting their daily activities.[7] Heartburn affects roughly about 30-50% of pregnant women. It manifests in the first trimester of gestation and subsides soon after delivery.[8] Urinary tract infections afflict many pregnant women, causing significant morbidity and adverse outcomes, such as preterm delivery, low birth weight and anemia.[9]

The objective of this research is to determine the frequency of anemia in pregnancy during first trimester and frequency of physiological symptoms which were reported in these mothers.

METHODS

A comparative cross-sectional study was conducted at a Rural Health Center in Pakistan from January to November 2021 (11 months). Formal permission to conduct the study was obtained from the hospital's ethical review committee. Informed consent was taken and an explanation of the purpose of the study was offered to the participants. All the pregnant women in the first trimester of pregnancy, willing to participate during the study period were included. Women unwilling to participate or with some chronic disease or anemia were excluded. Data were collected using a structured questionnaire based on all study variables and females were interviewed to fill the questionnaire. A 5ml of blood sample was taken. Sahli's method was used to determine hemoglobin levels in pregnant females. These Hb levels were taken after the confirmation of pregnancy by urine preg-nancy test in the center. Laboratory reports of urinalysis were used to make a diagnosis of UTI among these pregnant women in the health care facility. Pregnant women were classified into 4 categories based on severities of anemia, i.e., non-anemic, mildly anemic, moderately anemic, and severely anemic. A total of 801 first-trimester pregnant women were recruited for the study.

Non-anemic was defined as Hb levels ≥ 11g/dl or higher. Mild anemia was defined as Hb levels of 10 – 10.9 g/dl. Moderate anemia was defined as Hb levels ranging from 7.0- 9.9 g/dl and severe anemia was defined as Hb levels less than 7.0 g/dl. Data were analyzed using SPSS software.

Results

About 801 women attending the antenatal clinic (ANC) during the study period were included in the study. The minimum age was 15 years and the maximum age was 40 years. The mean age was 27.2 ± 4.6 SD years. Average hemoglobin levels were 9.82 ±0.66 g/dl (Table 1). Among 801 females, only 28 (3.5%) were found to be non-anemic during the first trimester. About 711 (88.7%) pregnant women were mildly anemic, 59(7.4%) were moderately anemic and 03 (0.4%) were severely anemic (Table 2)

Frequency distribution showing symptoms experienced by anemic and non-anemic pregnant women

Table 1: *Demographic data and hemoglobin levels of pregnant females (n=801)*

	n	Min.	Max.	Mean	Standard Deviation(±)
Age (years)	801	15.00	40.00	27.1407	4.55928
Hemoglobin (g/dl)	801	6.00	13.60	9.8296	0.66503

Table 2: Age-wise stratification of severity of anemia among women in their first trimester

Age in Years	Non-anemic *f* (%)	Mild anemia *f* (%)	Moderate anemia *f* (%)	Severe anemia *f* (%)
15-25	16 (2.0)	116 (14.5)	7 (0.9)	1 (0.125)
26-35	12 (1.5)	300 (37.4)	35 (4.4)	1(0.125)
36-40	0 (0)	295 (36.8)	17 (2.1)	1(0.125)
Total	28 (3.5)	711 (88.7)	59 (7.4)	3(0.375)

are shown in Table 3. Among anemic pregnant women, Nausea and vomiting were reported in 186 women (24.1%), heartburn in 114 (14.7%), UTI was reported in 96 (12.4%), 38 women complained of constipation (4.9%), 31(4.0%) reported backache, 27(3.5%) reported pelvic pain thus making a total of 492 (63.6%) anemic women who experienced pregnancy symptoms. 281 women (36.4%) reported no symptoms during the first trimester (Table 3).

Non-anemic women (2.8%) in the first trimester faced the same common physiological symptoms of pregnancy as anemic women. Nearly 4(14.3%) reported nausea and vomiting, 3(10.7%) reported heartburn, 1(3.6%) reported UTI, 1 reported constipation (3.6%), 2 reported backaches (7.1%) and1 reported pelvic pain (3.6%), making a total 12 (42.8%) women who experienced symptoms while 16(57.2%) non-anemic women reported no symptoms during the first trimester (Table-03).

Table 3: Comparison of symptoms among anemic and non-anemic pregnant women.

Symptoms	Anemic women (n=773) *f* (%)	Non-anemic women (n=28) *f* (%)
Nausea and vomiting	186 (24.1%)	4 (14.3%)
Heart Burn	114 (14.7%)	3 (10.7%)
UTI	96 (12.4%)	1 (3.6%)
Constipation	38 (4.9%)	1 (3.6%)
Backache	31 (4.0%)	2 (7.1%)
Pelvic pain	27(3.5)	1 (3.6%)
Total	492 (63.6%)	12(42.8%)
No symptoms	281 (36.4%)	16 (57.2%)

DISCUSSION

Our study showed that anemia is highly prevalent among pregnant women who came for their first ANC visit in their first trimester. Out of 801 women, 773 had anemia of pregnancy in varying severities. The prevalence of anemia among pregnant women was found to be 96.5%. Hameed et al (2018) found the prevalence to be 65.4%.[11] Shams et al conducted a study in Mardan and found the prevalence of anemia to be 76.7%.[12] Most of the women in our study were mildly anemic (88.7%) in their first trimester and belonged to the age group of 26 to 40 years i.e., 595 out of 711 making up 83.7% (Table 02). This prevalence of mild anemia in the first trimester of pregnancy was found to be in sharp contrast with the study conducted in Turkey by Ozturk et al (2017) who found it to be 16.64%. The same study showed the anemia prevalence close to 20% in the age group of 25 to 34 years while our study showed it to be 83.7% in the same age group.[13] The WHO recommendations on ANC for a positive pregnancy experience in 2016 state that pregnant women should take 30-60mg of elemental Iron and 0.4mg of Folic Acid once a day to prevent maternal anemia, puerperal sepsis, low birth weight, and preterm birth. In our study, anemia in the majority of these pregnant women was managed by the supplementation of iron and folic acid tablets along with dietary counseling. Some women were given intravenous iron and severely anemic women were referred to tertiary care hospitals for further management.

Noronha et al (2012) found anemia is the most frequent complication in South Asian pregnant women. The common factors that increase the risk of anemia were found to be non-compliance to iron supplements, low socioeconomic status, multiparity, extremes of age, dietary deficiency, and worm infestation.[2] Although our study population is similar and it can be safely assumed that similar factors are associated with a high prevalence of anemia, the relevant data is deficient and need to be further assessed.

Many symptoms in pregnancy are related to hormonal and physiological changes during pregnancy, and it poses a challenge to identify these from pathological causes and determine when these need to be referred to specialist care for management. Antenatal visits are an important part of primary assessment for the same reason and provide a chance for early identification and appropriate management.[6]

Nausea and vomiting are found to be the commonest symptoms in early pregnancy in various studies[6,14,15] Our study showed nausea and vomiting were present in 24.1% of the females in their first trimester (Table 3). Our data is deficient in the impact of these symptoms on patients' lifestyles, therefore further management options were not evaluated in the study results. A study conducted by Nawaz et al (2015) at LRH Peshawar and DHQ Mardan found it to be 14.5% and 8.4% respectively.[14]

Heartburn was the second most common prevalent finding among pregnant females i.e. nearly 14.6% of the women had heartburn while a study conducted by Lee et al (2021) showed the prevalence of heartburn as 30% in pregnancy.[15] A study conducted by Ather et al;[16] found that 22% of the women experience backpain during their pregnancy while our study showed it to be much less i.e., 4.0% of the females reported backache. Only 4.9% of the women reported constipation. These women did not have any prior history of constipation and were reported for the first time in pregnancy. A study conducted by Khalil et al, in 2019 reported it to be present among 18% of the pregnant females.[17] In our study, the prevalence of pelvic pain in the first trimester was 3.5%. Shahzad et al; in 2020 conducted a study and found it to be nearly 5.6% in the first trimester of pregnancy.[18] Nearly 12.1% of the women had confirmed UTI on basis of urinalysis test. This prevalence was found to be less than in a study conducted by Getaneh in 2021 who found it to be 15.37% among pregnant women of Ethiopia.[19] This is an observational study that identifies the prevalence of anemia and common pregnancy-asso-ciated symptoms. Our data do not identify the risk factors associated with these. There is limited data available to ascertain the severity of the symptoms, therefore the subsequent management options cannot be explored. The researchers believe that repeating this study with a longitudinal study design, and gathering further data on risk factors will improve the results.

CONCLUSIONS

Anemia in the first trimester of pregnancy is a common finding and anemic patients have more risk of having pregnancy-associated symptoms. The findings endorse the importance of early antenatal visits, as early detection of anemia can help with appropriate referral and management of the same. The anemia may contribute in increased incidence of pregnancy associated physiological symptoms. Thus an early intervention in this regard can improve the outcomes in these patients. Females should be encouraged for regular follow-up at health care facility. This aids in the identification of not only anemia but also other common problems and their management, helping to achieve positive health in these patients for better and healthy society.

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