Prevalence of Anaemia among pregnant women visiting Dagapela Dzongkhag Hospital from January 1 till June 30, 2021- A Technical report.

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Introduction

Anaemia is a "condition in which the number of red blood cells or their oxygen carrying capacity is insufficient to meet the physiological needs"; common symptoms include fatigue, weakness and dizziness (1). Anaemia is the most common micronutrient deficiency and has been proven to have major consequences on human health resulting in reduced social and economic development. Iron deficiency anaemia can occur at any stage of life in all genders, but is usually more prevalent in women owing to their higher iron needs during menstruation and pregnancy and among young children due to higher iron needs for their growth and often associated with limited dietary intakes at younger ages. Anaemia is a condition in which you lack enough healthy red blood cells to carry adequate oxygen to your body's tissues. Having anaemia also referred to as low haemoglobin, can make you feel tired and weak (2).

Etiology:

1. Dietary iron deficiency (attributed jointly by poor dietary diversification and poor food combinations)
2. Infectious diseases like malaria or hookworm infestation
3. Inherited disorders of haemoglobin structures like sickle celled anaemia
4. Other inherited disorders like thalassemia, haemophilia,
5. Blood loss or bleeding disorders
6. Medical conditions like chronic kidney disease (CKD), Carcinomas of blood and bone marrow, Crohn's disease, coeliac disease and Behcet's disease etc.
7. Other nutritional deficiencies like vitamin B12, folate, vitamin C and copper in regular diet

Anaemia is measured by assessing the amount of haemoglobin, a protein in red blood cells that carries oxygen throughout the body in the blood. Rates of haemoglobin are expressed in grams per decilitre (g/dL).
According to Mayo Clinic, in order to diagnose anaemia, your doctor is likely to ask you about your medical and family history, perform a physical exam, and run the following tests: A complete blood count (CBC) is used to count the number of blood cells in a sample of your blood. For anaemia, your doctor will likely be interested in the levels of the red blood cells contained in your blood (hematocrit) and the haemoglobin in your blood. Healthy adult hematocrit values are generally between 38.3% and 48.6% for men and 35.5% and 44.9% for

women. Healthy adult haemoglobin values are generally 13.2 to 16.6 grams per decilitre for men and 11.6 to 15 grams per decilitre for women. These values may differ slightly from one medical practice to another. Numbers might be lower for people who engage in intense physical activity, are pregnant or of older age. Smoking and being at high altitude might increase numbers. (2)

Types of Anaemia:

1. Aplastic anaemia
2. Iron deficiency anaemia
3. Pernicious anaemia
4. Sickle cell anaemia
5. Haemolytic anaemia
6. Thalassemia
7. Vitamin deficiency anaemia (2)

Check if you have iron deficiency anaemia, Symptoms can include:

- Tiredness and lack of energy
- Shortness of breath
- Noticeable heartbeats (heart palpitations)
- Pale skin

Less common symptoms of iron deficiency anaemia (that are not usually connected to pregnancy) include:

- Headaches
- Hearing ringing, buzzing or hissing noises inside your head (tinnitus)
- Food tasting strange
- Feeling itchy
- A sore tongue/ glossitis
- Hair loss – you notice more hair coming out when brushing or washing it
- Wanting to eat non-food items, such as paper or ice (pica)
- Finding it hard to swallow (dysphagia)
- Painful open sores (ulcers) in the corners of your mouth (angular cheilitis)
- Spoon-shaped nails/ Clubbing
- Restless legs syndrome (3)

Anaemia in pregnant women

Women are at higher risk of anaemia due higher iron needs during menstruation and pregnancy. In pregnant women, anaemia results in increased risk of maternal mortality and increases risk to the child including higher perinatal mortality, low birth weight, impaired cognitive and physical development and reduced productivity throughout adult life.

According to the National Nutrition Survey (NNS 2015), over one fourth (27.3%) of pregnant women were anaemic nationally in 2015, of which 23% were mildly anaemic and 5% were moderately anaemic. The survey did not record any severe anaemia. Regionally, eastern region had the highest percentage of anaemic women and anaemia prevalence was slightly greater in urban areas compared to rural.

Anaemia is a global public health problem affecting both developing and developed countries at all ages. According to World Health Organization (WHO), anaemia is defined as haemoglobin (Hb) levels less than 12.0 g/dl in women and less than 13.0 g/dl in men (4). According to WHO, during pregnancy, anaemia is identified by haemoglobin levels less than 11.0g/dL and may be divided into three levels of severity: mild anaemia (Hb levels 9 to 10.9g/dL), moderate anaemia (Hb levels 7 to 8.9g/dL), and severe anaemia (Hb levels less than 7g/dL) (4).

Anaemia Prevalence among pregnant women (15-49 years) in % of SEARO countries for the last five years

Country	Year 2015	Year 2016	Year 2017	Year 2018	Year 2019
Bangladesh	43.3	43.1	42.8	42.5	42.2
Bhutan	39.9	39.4	39.0	38.6	38.2
Democratic People's republic of Korea	38.0	38.3	38.5	38.6	38.8
India	50.6	50.4	50.4	50.2	50.1
Indonesia	42.1	42.7	43.2	43.7	44.2
Maldives	48.2	48.5	48.8	49.1	49.3
Myanmar	47.5	47.6	47.7	47.8	47.8
Nepal	43.5	43.2	43.0	42.7	42.5
Sri Lanka	33.8	34.1	34.3	34.5	34.6
Thailand	31.7	31.9	32.0	32.1	32.2
Timor Leste	35.1	35.8	36.6	37.3	38.0

Source: ***Global Health Observatory Data Repository (South-East Asia Region, last update 19.04.2021*** **(5).**

Discussion

Table No 1: Anaemia classification table of Women visiting Dagapela hospital between January through June, 2021.

Sl. No	Total number of women with Normal Haemoglobin level (>11g/dL)	Total number of women with Mild Anaemia (Hb 9-10.9 g/dL)	Total number of Women with Moderate Anaemia (Hb 7-8.9g/dL)	Total number of Women with Severe Anaemia (Hb less than 7g/dL)
1	96 (78%)	25 (20.3%)	02 (1.6%)	0

Table No 2: Parity and anaemia prevalence

Total Anaemia Percentage	Primi Gravida with Anaemia	Multi Gravida with Anaemia
26.9% (n=27) **27/123X 100** including both mild and moderate anaemia out of 123 pregnant women	**25.9% (n=7)**	**74.07 % (n=20)**

Table No 3: Education level and anaemia prevalence

Total women in ANC with anaemia out of 123	Total number of ANC women having qualification ranging from NFE till graduation and identified as anaemic **(n= 27)**	Total anaemic ANC women without any formal qualification out of **(n=27)**
27/123X 100= 27 (26.9%)	**18/27 X 100 = 18 (66.7%)**	**9/27 X 100 = 9 (33.3%)**

From the above data, it can be inferred that only one fourth (n=27 corresponding to 26.9%) of the total pregnant women registered at Dagapela hospital between January to June 2021 were found to be anaemic, of which **20.3% (n=25)** were mildly anaemic and **1.6% (n=2)** were moderately anaemic. The best part of the survey was it did not identify even a single one with severe anaemia and the majority **78% (n=96)** of the ante natal women were found to be non anaemic.

However, the interesting finding noted from the study was that three fourth **74.07% (n=20)** of the total anaemic women were found to be multiparas and only about one fourth **25.9% (n=7)** of the 27 anaemic women were nulliparous, indicating higher anaemia association with the increasing parity. According to a study conducted in Taiwan, titled ***Parity-based assessment of anaemia and iron deficiency in pregnant women*** published in 2020

concluded that anaemia and low serum ferritin levels occurred more commonly in multiparous than in nulliparous(6).

From the survey it was also learned that, there is no actual positive association between the education levels of the anaemic women and the anaemia prevalence as the majority **(66.7%)** of them were found to be either literate or educated with their qualifications ranging from non- formal education to university graduates. On the other hand, only a one third **(33.3%)** of the women with anaemia were not having any formal education.

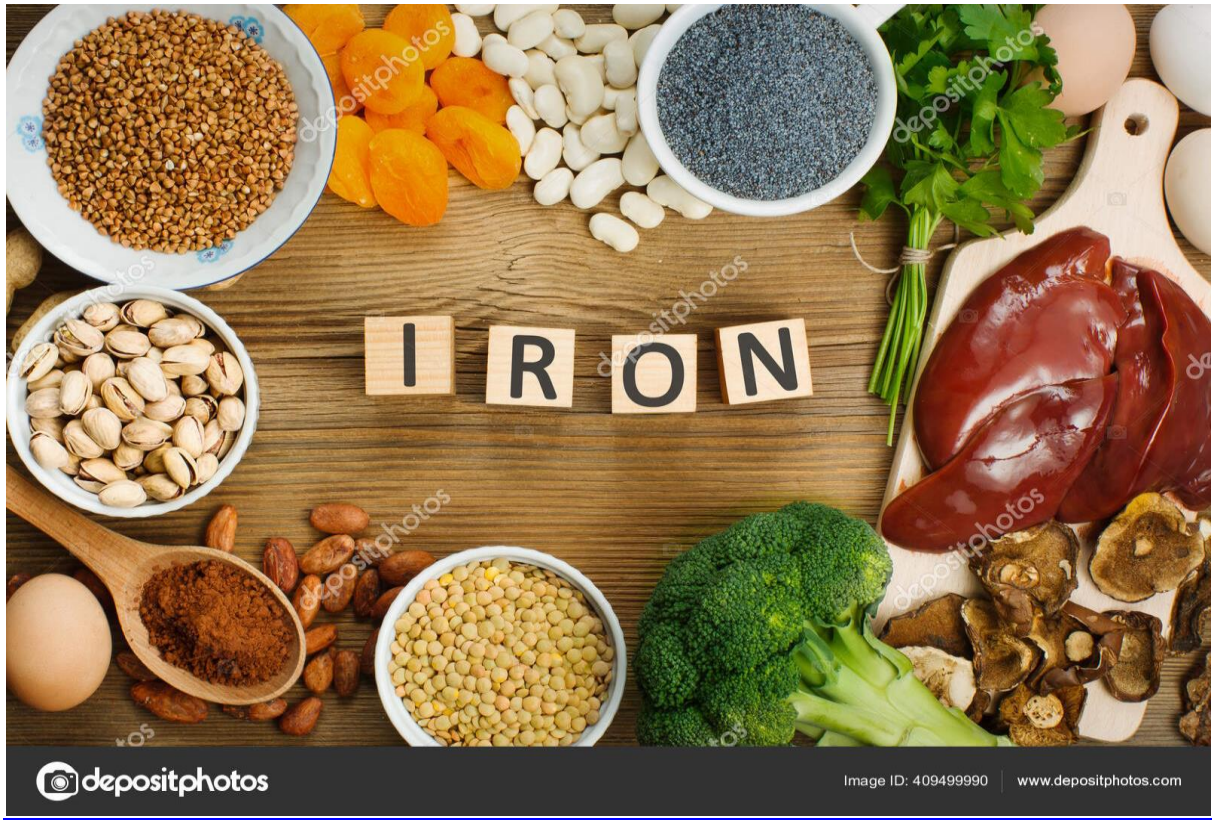
This very finding proves wrong/ reciprocates to our age old belief that educated people must be at better position in attaining optimal health and hygiene compared to their uneducated counterparts. The survey however, did not study or compare the association of anaemia between urban and rural women as the information was not collected on this during data collection. The results from a study titled ***"factors associated with anaemia among pregnant women in Dhaka city"*** by Hasina *et al*. showed that level of education of mothers had a significant association with maternal anaemia. This finding is supported by findings of Erlindawati *et al.* in which literacy of women had a significant association with the use of antenatal care services as education has an impact on awareness of use of health services among the population(7).

Recommendation:

Numerous studies in the developing countries have shown that anaemia, especially iron-deficiency anaemia (IDA), is highly prevalent among pregnant women (7). Anaemia during pregnancy, particularly iron-deficiency anaemia, continues to be a world- wide concern. It is recognized as the world's most prevalent nutritional disorder, affecting more than two billion people in both developed and developing countries. Pregnant women are particularly at risk of developing IDA with a highest prevalence in South- East Asia (8).

Interventions to prevent and correct iron deficiency anaemia include measures to increase iron intake through food based approaches, namely dietary diversification and food fortification with iron, iron supplementation and by improved sanitation and health services. For pregnant women, neonates and children, anaemia can cause a range of problems varying from increased risk of mortality to cognitive and physical development issues throughout life. Some of the foods rich in iron include dark green leafy vegetables like (spinach broccoli, red meats), organ meats like (liver, kidney, lungs), sea foods like (shell fish, sea weeds), poultry (chicken, turkey), pulses/peas and beans, nuts, beet root, egg yolks, honey, jaggery, pomegranates, dates, raisins, prunes and cereals like millets, quinoa and buckwheat. Other iron rich food sources include iron enriched cereal flours and dark chocolates.

IRON RICH FOODS (***Source:*** ***https://depositphotos.com/stock-photos/iron-rich-foods.html)***



Other ways of improving iron status among women of childbearing age and thus preventing anaemia would be by supplementing iron folic acid (IFA) tablets for 6 months to one year prior to planning their conception.

Some of the faulty dietary habits that would reduce or decrease the iron availability of foods in diet are:

1. Mixing greens and taking any other iron rich foods together with calcium rich diet especially dairy products. Calcium in the dairy will bind with iron and thus make it unavailable for absorption.
2. Taking antacids either in tablet or syrup forms too affects iron absorption, as it reduces the acidity , which is required for the best iron absorption.
3. Taking iron supplements along with tea or coffee which contains polyphenols/caffeine can as well interfere in the uptake of iron by intestinal cells, thus it is always good to take iron supplements with fruit juice or plain water.
4. Consuming iron rich foods with high fibre and high phytate foods too to some extent affect iron absorption.
5. Consuming tea along with meals, which is a customary practice in western Bhutan too can interfere in iron absorption and thus can cause iron deficiency anaemia. According to the findings of National Nutrition Survey, 2015 it was found that anaemia prevalence in the western region was found to be the highest amongst the children and women at 49.6% and 39.8% respectively.

However, in pregnant women it was found to be 25.6% for the western region against the national rate of 27.3%.

Some of the best practices towards taking iron rich foods and iron supplements are:

1. Always make sure it is taken with either ascorbic acid or some other citrus fruits, because acid in the food enables favourable acidic environment needed for iron absorption.
2. Make sure animal source foods are consumed daily or if not at least two to three times a week if you are non- vegetarian as they are rich in heme-iron and thus gets easily absorbed by the human intestinal system compared not vegetarian sources.
3. Consuming sufficient amount of high biological value protein is equally for the formation of haemoglobin, as the globulin part of blood is purely derived from protein.

Conclusion:

Survey on prevalence of anaemia among 123 pregnant women who have visited Dagapela hospital for ante-natal services between January through June, 2021 concluded that 26.9% a little over one fourth of them were found to be anaemic and mostly they were found to be iron deficient anaemia, as their haemoglobin status improved significantly during subsequent visits with IFA supplementation and in depth diet counselling on importance of consuming iron rich diets.

It was also inferred that the dietary interventions provided to the participants prior to and during the antenatal period had greatly proven to be helpful in improving the haemoglobin levels amongst the anaemic and in preventing anaemia for others.

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