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Anaemia 'a silent killer' among women in India: Present scenario

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ABSTRACT

Anaemia is the most prevalent nutritional deficiency disorder in the world. It affects all age groups but the most vulnerable are preschool-age children, pregnant women, and non-pregnant women of childbearing age. Globally, anaemia affects 1.62 billion people, which corresponds to 24.8% of the population. The highest prevalence of anemia exists in the developing world where its causes are multi-factorial. National Family Health Survey statistics reveal that every second Indian woman is anaemic and one in every five maternal deaths is directly due to anaemia. This review will focus on recent advances in our understanding of the burden of anemia in specific sub-groups, the causes and consequences of anemia among women.

Key words: Anaemia, Nutritional deficiency, Lactating mothers, Haemoglobin content, Infections

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INTRODUCTION

Global burden of Anaemia

Anaemia is the most common nutritional deficiency disorder in the world. It is a condition that occurs when the red blood cells do not carry enough oxygen to the tissues of the body. WHO defines anaemia as a condition in which the Haemoglobin (Hb) content of blood is lower than normal as a result of deficiency of one or more essential nutrients, regardless of the cause of such deficiencies [1]. Most of the anaemias are due to inadequate supply of nutrients like iron, folic acid and vitamin B12, proteins, amino acids, vitamins A, C, and other vitamins of B-complex group i.e., niacin and pantothenic acid are also involved in the maintenance of haemoglobin level [2].

Globally, anaemia affects 1.62 billion people, which corresponds to 24.8% of the population. The highest prevalence is in preschool-age children (47.4%), and the lowest prevalence is in men (12.7%). However, the population group with the greatest number of individuals affected is pregnant women (41.8%) [3]. In women, anaemia may become the underlying cause of maternal mortality and perinatal mortality [4]. Nearly 50 per cent of women of reproductive age and 26 per cent of men in the age group of 15-59 years are anaemic[5].

Nine out of ten anaemia sufferers live in developing countries, about 2 billion people suffer from anaemia and an even larger number of people present iron deficiency. An alarming 600 million people in South-East Asia are suffering from iron deficiency anaemia, predominantly affecting adolescent girls, women of reproductive age and young children. The condition has a prevalence rate of 74 percent among pregnant women in the region ranging from 13.4 percent in Thailand to 87 percent in India. About 74 percent of pregnant women in Bangladesh, 63 percent in Nepal, 58 percent in Sri Lanka and Myanmar, and 51 percent in Indonesia suffer from anaemia [6]. According to the National Family Health Survey (NFHS)-(III) [7], more than half of women in India (55%) have anaemia, including 39 % with mild anemia, 15 % with moderate anemia and 2 percent with severe anaemia. In

studies conducted in developing countries, adolescent anemia as the greatest nutritional problem. In India, 55 % adolescent girls are anaemic [6, 8].

WHO has estimated that prevalence of anaemia in developed and developing countries in pregnant women is 14 per cent in developed and 51 per cent in developing countries and 65-75 percent in India alone [9]. Prevalence of anaemia in South Asian countries is among the highest in the world. It is estimated that about half of the global maternal deaths due to anaemia occur in South Asian countries and India alone contributes to 50% of global maternal deaths and about 80 per cent of the maternal deaths due to anaemia in South Asia [4].

Indian Scenario

Prevalence of anaemia in all the groups is higher in India as compared to other developing countries [9, 10]. In India, anaemia affects an estimated 50% of the population. The problem becomes more severe as more women are affected with it as compared to men [11]. It is estimated that about 20%-40% of maternal deaths in India are due to anaemia and One in every two Indian women (56%) suffers from some form of anaemia [7]. According to National consultation on control of nutritional anemia in India [12] and [13], anemia is defined as the hemoglobin of less than 12 g/dl in females. Mild anemia is defined as hemoglobin level of 10-11.9 g/dl, moderate anemia as hemoglobin level of 7-9.9 g/dl and severe anemia was defined as hemoglobin level of less than 7g/dl among females. Data from National Nutrition Monitoring Bureau (NNMB)[14], Indian Council of Medical Research (ICMR) [15]and District Level Household Survey (DLHS) [16]surveys have shown that prevalence of anaemia is very high (ranging between 80->90%) in preschool children, pregnant and lactating women and adolescent girls. Low birth weight infants, young children and women of childbearing age are particularly at risk of anaemia. That way Anaemia begins in childhood, worsens during adolescence in girls and gets aggravated during pregnancy.

In India, adolescent girls, who constitute a sizable segment of its population form a vulnerable group and are at a greater risk of morbidity and mortality. It is the shaping period of life when maximum amount of physical, psychological and behavioral changes take place. This is a vulnerable period in the human life cycle for the development of nutritional anaemia [17]. Adolescent girls are particularly prone to iron deficiency anemia because of increased demand of iron for hemoglobin, myoglobin and to make up the loss of iron due to menstruation and poor dietary habits [18].

India has among the highest number of cases of anaemia in the world, according to the NFHS-III undertaken in 2005-2006. The reasons range from high cost of healthcare facilities, poor food quality and the low status of women. The survey further revealed that among the states, Assam is the worst affected with 72% of married women being anaemic, followed by Haryana (69.7%) and Jharkhand (68.4%). The prevalence of malaria in states like Assam was cited as one of the chief reasons for this sorry state of affairs [7]. Anaemia remains to be major cause of maternal mortality and low birth weight in India [8]. Moderate and severe anaemia is seen even among educated families and the higher income group [19]. Pregnant women with Hb less than 8 g/dl constitute a high risk group [16]. Seven states, Himachal Pradesh and Haryana in the North; Tamil Nadu and Kerala in the South; Assam and Orissa in the East and Madhya Pradesh in Central India were investigated. A total of 84 per cent pregnant and 92.2 per cent lactating women were anaemic with severe anaemia in 9.2 and 7.3 per cent respectively; 39.2 and 27.3 per cent in Madhya Pradesh, 14.4 and 8.6 per cent in Assam and 8.5 and 13.4 per cent in Haryana had severe anaemia in pregnancy and lactation, respectively [20]. ICMR data in the same districts also reported 90.1 per cent adolescent girls with anaemia (7.3% having severe anaemia). ICMR district nutrition survey (1999-2000) reported prevalence of anaemia as 84.2 per cent with 13.1 per cent with severe anaemia in pregnancy [21]. So, these findings suggest continuation of anaemia throughout life in women.

Other than pregnant women and lactating mothers, scenario is not good in the normal population. Punjab is known as a prosperous state of India but the status of anaemia among young girls and women is alarming. 70.57% young girls of Amritsar, known as a heritage and religious city of Punjab, were observed as anaemic [22]. May be that they were belonging to scheduled class which is considered as an under privileged class of the society. So, they might be living in sub standard conditions and deprived of proper diet. In a recent study conducted in rural population of Patiala, one of the major city of Punjab, Kaur and Kaur [23] observed that 98% of female and 56% of male subjects were anaemic. It was further suggested that poor nutrition profile of the women is positively correlated with haemoglobin level among them. This figure not only projects the highest prevalence of anemia among rural girls of Patiala but also suggests that women are more prone to become anaemic than men. Similarly, Kaur and Kochar [24] reported 91.3% of rural and 86% of urban women of Haryana Jat community as anaemic showing not only high

prevalence among rural population but also reported higher prevalence of anaemia among older women (97% rural, 90% urban) compared to middle-aged women (88.5% rural, 84% urban). It may be that the dietary intake of most of the middle aged women (40-59 years) is less than the recommended value. It further projects that rural women are more prone to become anaemic than urban subjects. It may be that they are less educated and are deprived of proper diet due to male biased societies in rural areas. They do more physical work and need a well balanced diet. Individuals who take nutritionally deficient diet and are more susceptible to parasitic infestations and other chronic infections become more anaemic [11]. Other than Punjab and Haryana, the status of anemia in many other states of India is worrisome. Studying the data of NFHS-(III), 65.6 % women of Kolkata were observed as suffering from anaemia [25], whereas, 45.2% young girls of Karnataka and 34.82% young girls and women of Kannada were reported as anaemic in two recent studies [26, 27].

Consequences

In the milder form, anaemia is "silent", without symptoms. In its severe form, anaemia is associated with symptoms like fatigue, weakness, dizziness and drowsiness. It may further include loss of normal colour in the skin (in fair skinned people) and also in the lips, tongue nail

Table 1. Anaemia among Young girls and Women in different populations of India

Place	Total No	Age Group	Normal	Anaemic	Mild	Moderate	Severe	Investigator
Rural women of North India	136	16-70		50(88)	30.1(41)	19.1(26)	0.7(1)	Mahajan et al., 2004
SC Girls (Amritsar)	265	11-15	78	70.57(187)	30.57(81)	27.17(72)	12.83(34)	Sidhu et al., 2005
Urban area, Nagpur	296	10-19	192	35.1(104)	69.2 (72)	30.8 (32)	-	Chaudhary and Dhage, 2008
Jat Haryana	R=300 U=300	40-70	R=26 U=42	88.7 [R=91.3(274) U=86(258)]	-	-	-	Kaur and Kochar, 2009
Kolkata	19,695 NFHS-3			65.6	47.9	16.1	1.6	Ghosh, 2009
Rural Girls, Patiala	50	16-18	1	98	18 (9)	56 (28)	14 (7)	Kaur and Kaur, 2011
Anganwari centre, rural Karnataka	314	10-19	172	45.2(142)	40.1(126)	54.92(172)	4.92(16)	Siddharam et al., 2011
Rural area in Dakshina, Kannada Dist. of Karnataka	155	15-45		34.82(54)	-	-	-	Raghuram et al., 2012

The figures given in parenthesis are the number of subjects.

beds and the blood vessels in the white of the eye. If not treated, anaemia can worsen and becomes an underlying cause of chronic ill health, such as impaired fetal development during pregnancy, delayed cognitive development and increased risk of infection in young children, and reduced physical capacity in all people [28, 29, 30]. So, the results of anemia are tragic. These include increased maternal and newborn mortality, impaired health and development of infants and children, limited learning capability, impaired immune functions and reduced working and productive capacity of those affected. Iron deficiency and anaemia are thus, impediments to individual growth and national development (http://www.who.int/water_sanitation_health/diseases/anemia/en/. Retrieved on July 17th, 2012).

Factors

The main causes of anaemia are nutritional and infectious. Among the nutrition factors contributing to anaemia, the most common one is iron deficiency. It is due to a diet that is monotonous, but rich in substances (phytates) inhibiting iron absorption so that dietary iron cannot be utilised by the body [31]. Iron deficiency may also be aggravated by poor nutritional status, especially when it is associated with deficiencies in folic acid, vitamin A or B12, as is often the case in populations living in developing countries. With regard to infections, malaria is another major cause of anaemia: it affects 300-500 million people, and in endemic areas it may be the primary cause of half of all severe anaemia cases [8]. Hookworm infection and in some places schistosomiasis also contribute to anaemia. Approximately 44 million pregnant women have hookworm infections and 20 million people are severely infected with schistosomiasis (http://www.who.int/vaccine_research/diseases/soa_parasite/en/index2.html, retrieved on July 13, 2012. Anaemia can also be due to excessive blood loss, such as gastrointestinal infections associated with diarrhoea. The most important water-related causes of anaemia are malnutrition and water-borne or water-related infections. In India, the prevalence of anaemia is high because of low dietary intake, poor iron (less than 20 mg /day) and folic acid intake (less than 70 micrograms/day); poor bio-availability of iron (3-4 percent only) in phytate fibre-

rich Indian diet; and chronic blood loss due to infection such as malaria and hookworm infestations. The low dietary intake of iron and folic acid coupled with poor bioavailability of iron is the major factor responsible for very high prevalence of anaemia in the country [14, 15].

But the major factor in our society is socio-cultural. Due to the patriarchal nature of our society, women are discriminated from birth. The discrimination against girls results in an attitude of neglect towards them and they receive inadequate nutrition right from childhood. Nutrition deficiency such as protein, vitamin C and iron leads to anaemia among most girls and women. After marriage, a woman' status in the family and society is determined by her reproductive functions and that too on the number of male children she bears. In the adolescent phase due to menstruation, the requirement of iron increases. Every month about 40 ml. blood is lost with approximately 0.6 mg of iron. This increased requirement for iron is not met due to discriminatory social beliefs and food restrictions. According to WHO, women of childbearing age need to absorb 2-3 times the amount of iron required by men or older women [8].

Many a time, the girl child is not only breastfed for a less duration but food supplementation to her is also delayed. Most girls are not groomed to make decisions regarding their life, health, education or marriage. This holds true even in case of food allocation and consumption. The lack of self esteem makes women offer their husbands the best of everything available in the household including food. It is believed that if a woman, who cooks food, eats first, does not have a prosperous household. She is supposed to eat last, never grumble about getting less or not eating rich diet [32].

DISCUSSION

According to WHO if the prevalence of anemia at community levels is more than 40%, it is considered as problem of high magnitude [13]. The problem of anemia is related to wider population than the traditionally considered groups of the pregnant and lactating females and children. With the onset of menstruation and associated blood loss, there is a further rise in prevalence and severity of anaemia in adolescent girls [18]. There is an urgent need for improving overall nutritional status of adolescents through nutrition education, community awareness and supplementation programmes. The need for regular blood tests to check hemoglobin levels is emphasized. Nutrition component needs to be included in the school curriculum. Emphasis is needed for corrective measures of anemia and iron deficiency in girls before they enter into adolescent age group.

Screening for anaemia, treatment of anaemic women, and availability of food fortification (wheat flour with iron and folic acid), milk sugar and salt with iron to build long term iron stores remains the key to reduce anaemia. Even cooking in cast iron utensils improves iron content in diet [33]. The anaemia control programme needs to be implemented more efficiently in these States. The interstate differences observed may guide the health planner to alter the strategies for control of anaemia as per requirement of the state. In many states like Punjab where male female ratio is still alarming, the issue becomes more serious as females are deprived of almost everything from their birth and being affected at the nutritional front is not uncommon. Need is to change the view point and bring women's health at priority not at family level but at state level as maternal iron deficiency and anaemia render the offspring vulnerable for developing iron deficiency and anaemia right from infancy.

According to Capoor, Gade and CHETNA* Team (2000), the Government of India has initiated several supplementary nutrition programmes at the central and state level, to improve the nutritional status of the people and eradicate anaemia. But these programmes made very little impact because of they did not take into account the socio-economic and political reasons of anemia among women. For example, most of the programmes address nutrition during the first six years of life, and then skip directly to pregnancy and lactation. Adolescence, which is the period of additional nutritional requirement, is not addressed through these programmes. Very little space is available to create awareness on the importance of understanding women's nutritional needs throughout various stages of her life, and to ensure that women eat the food that reaches the household.

On the surface, anaemia seems to be simply a physical ailment, the result of low iron and protein intake, perhaps aggravated by hookworm, malaria, or hemorrhage. But anaemia is much more complex. It is a symptom of serious socio-economic and political illness.

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* Centre for Health Education, Training and Nutrition Awareness (CHETNA) is a non-government support organisation based in Ahmedabad in Gujarat State, India, with a regional unit in Jaipur, Rajasthan State. CHETNA's mission is to assist in the empowerment of disadvantaged women, adolescents and children to gain control over their own, their families' and communities' health.