ORIGINAL ARTICLE

STUDY OF ANAEMIA IN SURAT, WESTERN INDIA

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ABSTRACT

Background: The distribution of social and biological risk factors makes the epidemiology of anaemia a real challenge. A cross-sectional study was conducted at Surat, Western India during 2009 to investigate the prevalence and predictors of anaemia among adults (> 18 years old).

Results: Out of 129, 47(36.4%) adults had anaemia; 13 (10.1%); 27 (20.9%) and 7(5.4%) had mild, moderate and severe anaemia, respectively. In analyses, male vs. female gender (P = 0.2), age (< 50 yrs Vs ≥ 50 years) (P = 0.6), rural vs. urban residency (P = 0.8), educational level < secondary level vs. ≥ secondary level (P = 0.7) were not associated with anemia.

Conclusion: There was a high prevalence of anaemia in this setting, anaemia affected adults regardless to their age, sex and educational level. Therefore, anaemia is needed to be screened for routinely and supplements have to be employed in this setting.

Keywords: Anemia, Adults, Prevalance, Screening.

INTRODUCTION

According to the National Family Health Survey (NFHS-II, 1998-99) 52% of Indian women are anemic. In major states like Bihar, Orissa, West Bengal more than 60% of the women suffer from anemia, whereas in Kerala anemia level is the lowest in the country – 22.7%. Data from the National Nutrition Monitoring Bureau (NNMB-2003) indicate that in India nearly 75% of the pregnant mothers are anemic. For the eight states for which data is available, anemia among pregnant mothers ranges from a low of about 50% in Kerala, to a high of about 84% in Madhya Pradesh.

Anaemia is a major public health problem, especially in developing countries [1]. It is common in adult and the prevalence of anaemia is increasing with advancing age [2]. There is however, a significant variation in prevalence of anaemia, both within and between countries, necessitating a need for local data for preventive measures. Anaemia is associated with adverse outcomes among adult such as reduced quality of life, depression, increased disability, higher risk of Alzheimer disease and increased risk of mortality [3,4]. Anaemia is a multifactorial condition

and the increased heterogeneity in the distribution of social and biological factors with advancing age makes the epidemiology of anaemia a real challenge [5]. Epidemiology of anaemia is important for deciding the control strategies. Thus, studies investigating these parameters are vital and of great interest, so as to provide health planners and caregivers with fundamental guidelines for the implementation of preventive measures. Therefore, the aim of this work was to investigate the prevalence and predictors of anaemia among adults.

MATERIAL AND METHODS

This was a cross sectional community- based survey of adults (>18 year old) residents in Surat, Western India in 2009. One hundred- twenty nine adults were enrolled in the study and there was no exclusion criterion other than age and pregnancy. Participants selection was random and non consecutive. An observational study was carried out at Urban Health Center, Surat City. After informed consent a pre-tested questionnaire was used to gather socio-demographic data (age, sex, educational level, residence, ethnicity and occupation), medical history of chronic illness such as hepatic disorders, renal disease, thyroid disease, arthritis, blood disorders or diabetes mellitus and awareness of their hemoglobin level. Blood films for malaria, Urine & stool examination conventionally performed [6]. Anaemia was defined according to the WHO criteria as a hemoglobin concentration lower than 12 gm/dl in women and 13gm/dl in men. Anaemia was defined as mild, moderate and severe when hemoglobin concentration was 9.5.–13 g/dl, 8—9.4 g/dl and <8 g/dl, respectively [7].

Statistic analyses

Means and proportions for the socio-demographic characteristics were compared between the anemic and non-anemic groups using student t-test and x2 test,

respectively. Anaemia was the dependent variable and socio-demographic characteristics with their referral groups were independent variables. Confidence intervals of 95% were calculated and P<0.05 was considered significant.

RESULT

Blood test results of 129 adult persons were included in the study. Out of these 129 subjected, 64(49.6%) were females. The entire prevalence of anaemia among the surveyed subjects was 36.4% (47/129) and it was 35.4% and 37.5% among male and female, respectively (P=0.2>0.05)

Table 01: Marital Status of Study participants

Marital Status	Anemic	Non-Anemic	Total (%)
Married	45	81	126 (97.7)
Unmarried	00	01	01 (0.8)
Widow	02	00	02 (1.6)
Total	47(36.4%)	82(63.6%)	129 (100)

Table 02: Age Distribution of Study participants

Age Group	Anemic		Non-Anemic		Total (%)
	Male	Female	Male	Female	
21-30	01	02	02	03	08 (6.2)
31-40	04	02	03	02	11 (8.5)
41-50	10	11	22	20	63 (48.8)
51-60	07	08	13	14	42 (32.6)
61-70	01	01	02	01	05 (3.9)
Total	23 (17.8%)	24 (18.6%)	42 (32.6%)	40 (31.0%)	129 (100)

Majority of patients-126(97.7%) were Married. The mean age of 129 participants was 49.2 ± 3.2 (mean ± SD) years. Age (< 50 yrs Vs ≥ 50 years) is non-significantly associated with anemic status. (P = 0.6>0.05)

Table 03: Residency Status of Study participants

Residency	Anemic (%)	Non-Anemic (%)	Total (%)
Rural	26(47.3)	29(57.7)	55(42.6)
Urban	21(28.4)	53(71.6)	74(57.3)
Total	47(36.4)	82(63.6)	129(100)

Table 04: Educational Status of Study participants

Educational	Anemic (%)	Non-Anemic (%)	Total (%)
Uneducated	11 (42.3)	15 (57.7)	26 (20.2)
Primary Level	29 (34.9)	54 (65.1)	83 (64.3)
Secondary Level	03 (33.3)	06 (66.7)	09 (06.9)
Graduate	04 (36.3)	07 (63.7)	11 (08.6)
Total	47 (36.4)	82 (63.6)	129 (100)

55(42.6%) had rural residency. Non-significant difference is seen between Anemic Group & Residency Status (rural vs. urban residency) (P=0.8>0.05). 109 (84.5%) had less than secondary educational level. Non-significant difference is seen between Anemic Group & Educational Status (< secondary level vs. ≥ secondary level) (P=0.7>0.05).

Table 5: Anemia Status of Study participants

Severity of Anemia	Frequency (%)
Mild (Hb = 9.5.–13 g/dl)	13(10.1)
Moderate (Hb = 8-9.4 g/dl)	27(20.9)
Severe (Hb<8 g/dl)	07(5.4)
Total Anemic	47(36.4)
Non-Anemic	82(63.6)
Total	129(100)

Out of 129, Anaemia was mild, moderate and severe in 13 (10.1%); 26 (20.0%) and 7 (5.7%) patients, respectively. The mean hemoglobin level was 11.6 ± 2.2 gm/dl of Total 129 Participants. Almost all (96.3%) of the anaemic subjects perceived themselves as non-anaemic ones. History of tuberculosis and renal insufficiency were reported in 1 and 4 anaemic persons, respectively. While none of the patients had hook worms, two of them had urinary tract infections and one of them had P. falciparum malaria.

In analyses, male vs. female gender (P = 0.2), age (< 50 yrs Vs ≥ 50 years) (P = 0.6), rural vs. urban residency (P = 0.8), educational level (< secondary level vs. ≥ secondary level) (P = 0.7) were not associated with anemia.

DISCUSSION

This study revealed that, anaemia is a major health problem in Surat, Wesrtern India. According to the WHO, a severe public health problem exists if the prevalence of anaemia is ≥40% in any group[1]. Therefore, there is a need to re-evaluate or strengthen the current strategies to control anaemia among adults in this setting. In this study anaemia affects adults regardless to their age, sex, educational level and residence. The prevalence of anaemia usually increases with age particularly after 60 year and this was explained by increase incidence of chronic illness and poor nutritional status in old people [8,9]. Anaemia was reported in 16%–94% of patients with tuberculosis[10,11]. Like the tuberculosis itself, other infections might lead to anaemia by suppressing erythropoiesis by inflammatory mediators[12]. However, other chronic inflammatory disease such as sexually transmitted diseases, HIV, tuberculosis and inflammatory bowl diseases were not investigated in this study. HIV infection has to be considered as a possible etiologic factor for anaemia. In the current study, only one patient had P. falciparum malaria. The area is characterized by unstable malaria transmission.

The major limitation of our study is that the dynamic of the onset and recovery of anaemia is not yet characterized by using short time (< 1 year) serial blood collection. Ferrucci et al., found that 8% of the older adults with normal hemoglobin level subsequently developed anaemia at 3-year follow up[13]. Also this study didn't investigate the possible causes of anaemia to facilitate the strategies for the preventive programmes. Recently high level (38.0%) of zinc deficiency was observed among pregnant women[14]. The most common cause of anemia worldwide in elderly is anemia of chronic disease [15]. Iron deficiency is frequently

seen in elderly, typically as a result of chronic blood loss through GIT[16]. Vitamin B12 deficiency, folate deficiency, MDS are among other causes of anemia in elderly[17].

CONCLUSION

There was a high prevalence of anaemia in this setting, anaemia affected adults regardless their age, sex and educational level. Therefore, anaemia is needed to be screened for routinely and supplements have to be employed in this setting.

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