

## Prevalence of anaemia in elderly rural population of block Lakhanmajra, District Rohtak, Haryana, India

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### Abstract

**Background:** Anaemia is universal in the elderly and its prevalence increases with age. In our country an old person, in addition to the effects of aging, is often subjected to the problems of dependency, deprivation, disability, poverty, ignorance, loneliness and rejection of the family members etc. under such circumstances, it is likely that anaemia, which is quite prevalent even in adulthood may further worsen in old age. Hence the study was conducted to find out the prevalence, types of anaemia and association of various factors with anaemia in elderly rural population.

**Methods:** The present study was conducted in Rural Community Development block Lakhan Majra having a population of approximately 98000, as sample study population. A house to house visit of the whole sample population (497 males and 503) was done to gather information on relevant factors on pretested semi-structured questionnaire and blood samples were taken for haemoglobin estimation by Sahli technique and the blood slides were prepared to find out the type of anaemia.

**Results:** The prevalence of anemia was 90.4% (84.15 in males and 96.6% in females). Microscopic examination revealed that about 50 % of elderly showed the features of iron deficiency anemia. The most common type of anaemia was normochromic normocytic (41.3%) followed by microcytic hypochromic (19.8%), normocytic hypochromic (13.5%), dimorphic (7.1%). There was significant association of age, sex, living spouse, physical activity, consumption of curd/Lassi with level of haemoglobin. The relationship of caste distribution, literacy, family income, occupation, type of family, behavior, smoking, alcoholism, drug intake, tea intake, chronic diarrhea, history of bleeding were studied and the observed difference amongst all were found to be insignificant.

**Conclusions:** Elderly population constitutes 7.2% of the total population and mostly (90.4%) were anaemic and the prevalence of severe anaemia was 4.8%. The microscopy examination revealed that about half of the elderly, iron deficiency was the main cause of anaemia. The study made a strong case of implementation of iron supplementation and dietary intervention for elderly.

**Keywords:** Elderly Population, Anaemia in Elderly, Nutritional Status in Elderly.

### Introduction

The ageing process is biological reality that begins at conception and continues throughout the life cycle. The manner in which someone ages depends on heredity, physical health, nutritional, mental, and other unknown factors. Broadly speaking, ageing of a population has been defined as increase in the proportion of the aged vis-à-vis a decrease in proportion of the young.

During the past few decades, discoveries in the medical sciences and improved social conditions have increased the life span of man and therefore, the age structure of population is changing as the share of the elderly is increasing. In India, the population of the elderly is growing rapidly and is emerging as a serious area of concern for the government and the policy planners for better living conditions and services. As a result of declining mortality and relatively lower and more stable fertility rates, the proportion of people over 60 in the developing countries is expected to increase.

According to data from World Population Prospects: the 2015 Revision (United Nations, 2015), the number of older persons—those aged 60 years or over—has increased substantially in recent years in most countries and regions, and that growth is projected to accelerate in the coming decades. Between 2015 and 2030, the number of people in the world aged 60 years

or over is projected to grow by 56 per cent, from 901 million to 1.4 billion, and by 2050, the global population of older persons is projected to more than double its size in 2015, reaching nearly 2.1 billion. Between 2015 and 2030, the number of people in the world aged 60 years or over is projected to grow by 56 per cent, from 901 million to 1.4 billion, and by 2050, the global population of older persons is projected to more than double its size in 2015, reaching nearly 2.1 billion. Over the next 15 years, the number of older persons is expected to grow fastest in Latin America and the Caribbean with a projected 71 per cent increase in the population aged 60 years or over, followed by Asia (66%), Africa (64%), Oceania (47%), Northern America (41 per cent) and Europe (23%).<sup>(1)</sup>

Elderly people have special health and socio-economic problems different from those of general population.<sup>(2,3)</sup> Multiple pathology is hallmark of elderly subjects. Ageing process is responsible for the functional decline of multiple organs; a similarly decline occurs in marrow functions in humans. Anaemia is a public health problem that affects populations in both rich and poor countries. Although the primary cause is iron deficiency, it is seldom present in isolation.<sup>(4)</sup> More frequently it coexists with a number of other causes, such as malaria, parasitic infection, nutritional deficiencies,

and haemoglobinopathies).<sup>(5)</sup> Anaemia is universal in the elderly and its prevalence increases with age. In our country an old person, in addition to the effects of aging, is often subjected to the problems of dependency, deprivation, disability, poverty, ignorance, loneliness and rejection of the family members etc. under such circumstances, it is likely that anaemia, which is quite prevalent even in adulthood may further worsen in old age and it may prove as a major obstacle in our aim of having active aging. Anaemia has several deleterious effects on the body, the impaired work capacity being the commonest. The present study was conducted to know the magnitude of the problem and the associated social and other factors so as to offer sound recommendations for an effective intervention for the prevention and control of anaemia in the elderly.

Globally, anaemia affects 1.62 billion people (95% CI: 1.50–1.74 billion), which corresponds to 24.8% of the population (95% CI: 22.9–26.7%). The highest prevalence is in preschool-age children (47.4%, 95% CI: 45.7–49.1), and the lowest prevalence is in men (12.7%, 95% CI: 8.6–16.9%). However, the population group with the greatest number of individuals affected is non-pregnant women (468.4 million, 95% CI: 446.2–490.6).<sup>(6)</sup>

### Materials and Methods

The present study was conducted in Rural Community Development block Lakhna Majra having a population of approximately 98000. The block level Primary health centre (PHC) is situated at Village Chiri. There are 24 Villages in the block served by three PHC, 20 Subcentres (S/C) and 91 Anganwadi (A/W) Centres. Elderly persons aged 60 years and above were study subjects Study Population. 15 A/W centres were selected randomly out of total 91 A/W centres of the block, as sample study population. These 15 A/W centres covered 15760 populations. There were total 1123 elderly persons (558 males & 565 females) in the sample study population. Out of these 499 males and 505 females were contacted and blood samples were taken for haemoglobin estimation. Out of these 497 males and 503 females were included in the study. Two males and three females were not included due to their non cooperation in filling up the required schedule. The study was a community based cross sectional study. A house to house visit of the whole sample population was conducted to enlist all the elderly persons with the help of A/W workers and health workers. The blood samples were collected in screw capped tubes having 5 ml Drabkins reagent. The estimation of haemoglobin within 24 hrs by Cyanmet-haemoglobin method and microscopic examination of slides for typing of anaemia were done in Department of Pathology, Pt B D Sharma

### Results

PGIMS, Rohtak, Haryana. At the time of sample collection, the information required regarding various relevant factors were collected on a pretested semi-structured schedule by the investigator. As the study included all elderly in the sample population, therefore, by way of analyzing haemoglobin levels and type of anaemia, the proportion of different relevant factors (preventable & non preventable) associated with anaemia were not found.

A subsample of 60 elderly persons (30 males and 30 females) who were apparently healthy was selected randomly from the enlisted elderly population for studying association of diet with anaemia in detail. All the elderly persons having history suggestive of bleeding from any site, melena, malignancy, chronic respiratory insufficiency diseases, history of worms, any debilitating disease or bed ridden were not included in the sub sample of dietary survey. The dietary in-take survey was done by "Recall Method". The Laboratory examination reports and the data collected on a semi structured pretested schedule which was suitably modified after pre-testing, was compiled, analyzed and subjected to appropriate statistical tests.

### Study Definitions

#### Anaemia in Elderly

As per World Health Organization (WHO) criteria anaemia is defined a haemoglobin level below 13 gm% in male and below 12 gm% in females. All males and females of 60 years and above were taken as elderly.

#### Classification of Anaemia: (as per WHO criteria)<sup>(7)</sup>

Below 7gm%	Severe
Between 7 to 10 gm%	Moderate
Between 10 to 13 gm% for male	Mild
Between 10 to 13 gm% for female	Mild

For the sake of convenience, the cut off level of haemoglobin in male and female elderly was taken as 12 gm% for both sexes in the study instead of 13 gm% in males and 12 gm% in females.

#### Parameters for defining the magnitude of the problem are given in tabular form below

	Magnitude		
	High	Mode-rate	Low
% of Population with less than defined cut off	> 40	10 to 39	1 to 9
% of Population with haemoglobin less than 7 gm%	> 10	1 to 9	< 1

In our study, 90.4% of elderly were anaemic (<12 gm %), out of which 4.8% were with severe anaemia (<7

gm%). Out of 497 males, 416(84.1%) and out of 53 females, 486 (96.6%) were found to be anaemic (Hb <12 gm% in both sexes), 3.6% of males and 6.0% of females were having severe anaemia. About one third of males

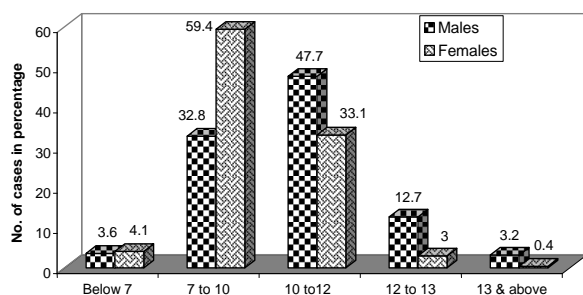
and two fifth of the females were having moderate anaemia. The sex wise observed difference in anaemia in elderly was significant.

**Table 1: Distribution of Haemoglobin level with age**

Age (years)	Haemoglobin level in (gm%)								Total	
	< 7		7 to 10		10 to 12		>12		No.	%
	No.	%	No.	%	No.	%	No.	%		
60 to 69	24	3.5	309	45.1	284	41.5	67	9.9	684	68.4
70 to 79	11	4.8	102	44.1	93	40.3	25	10.8	231	23.1
80 & above	13	15.3	45	52.9	23	27.1	04	4.7	85	8.5
Total	48	4.8	456	45.6	400	40.0	96	9.6	1000	100.0

The most common type of anaemia observed was normochromic normocytic (41.3%) followed by microcytic hypochromic (19.8%), normocytic hypochromic (13.5%), dimorphic (7.1%). The observed age wise difference was significant in the age group of 80 yrs and above. It was good to note that about 2/3<sup>rd</sup> of the elderly having no occupation were involved in household work and 27.5% were doing routine activities, only 5% were bed ridden and the observed difference in the haemoglobin level with level of activity was found to be significant. 2/3<sup>rd</sup> of the elderly had their spouse alive and the haemoglobin level amongst them was higher as compared to the elderly without live spouse and the observed difference was significant.

It was good to note that more than half of the elderly were taking curd/lassi in routine and about 1/4<sup>th</sup> frequently. The proportion of elderly with severe to moderate anaemia was much low (40.3%) in those who were taking lassi/curd routinely as compared to others (64%) and the observed difference was found to be significant. About 1/3<sup>rd</sup> of the elderly were having one or the other chronic disease and mostly had arthritis and asthma. The percentage of severe anaemia in elderly with chronic disease was about double than others. The relationship of caste distribution, literacy, family income, occupation, type of family, behavior, smoking, alcoholism, drug intake, tea intake, chronic diarrhoea, history of bleeding were studied and the observed difference amongst all were found to be insignificant. Two third of the elderly were having spouse alive. The level of haemoglobin was low in elderly without spouse. The observed association was found to be significant (Table 2).



**Fig. 1: Sex wise distribution of different levels of haemoglobin in elderly**

**Table 2: Relationship of Haemoglobin level with survival of spouse**

Status of Spouse	Haemoglobin level in gm%								Total	
	< 7		7 to 10		10 to 12		12 & above		No.	%
	No	%	No	%	No	%	No	%		
Alive	27	4.0	278	41.7	286	42.8	76	11.5	667	66.7
Dead	21	6.3	178	53.4	114	6.1	20	6.1	333	33.3
Total	48		456		400		96		1000	

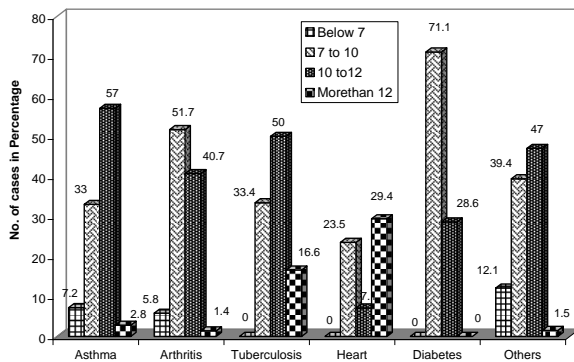
$\chi^2=19.8$  df=9 P<0.05.

It was good to note that more than half of the elderly were taking curd/ lassi as a routine. The observed difference was significant (Table 3). It was good to note that 2/3<sup>rd</sup> of the elderly having no occupation were involved in household work and 27.5% were doing routine activities, only about 5% were bed ridden. The observed difference in the haemoglobin level with level of activity was found to be significant.

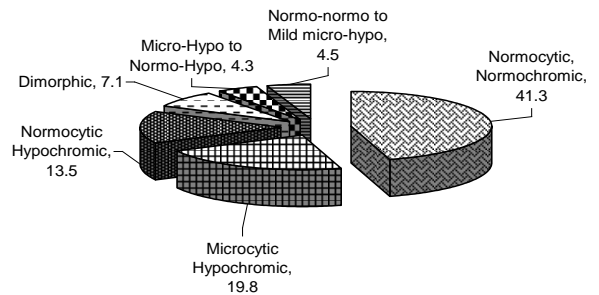
**Table 3: Relationship of Haemoglobin with intake of Lassi or Curd**

Intake of Lassi/Curd	Haemoglobin level in gm%								Total
	< 7		7 to 10		10 to 12		12 & above		
	No.	%	No.	%	No.	%	No.	%	
Routinely	29	3.7	322	41.3	347	44.6	80	10.2	778
Occasionally	13	10.4	78	62.4	25	20.0	9	7.2	125
Never	6	6.2	56	57.8	28	28.8	7	7.2	97
Total	48	4.8	456	45.6	400	40.0	96	9.6	1000

$\chi^2=88.48$  df=9 P<0.001



**Fig. 2: Relations of Haemoglobin with history of chronic disease**



**Fig. 3: Types of Anaemia (%)**

**Table 4: Haemoglobin level in relation to Level of Activity**

Level of activity	Haemoglobin level in gm%								Total
	< 7		7 to 10		10 to 12		12 & above		
	No.	%	No.	%	No.	%	No.	%	
Household Work	23	4.2	250	45.9	203	41.0	489	8.9	544
Routine Activity	14	6.7	105	46.7	86	38.2	19	8.5	224
Bed Ridden	04	8.4	25	53.4	11	23.3	07	14.7	47
Total	51		580		320		74		815

$\chi^2=50.7$  df=6 P<0.001

**Discussion**

The prevalence of anaemia was 90.4% (84.1% in males and 96.6% in females), haemoglobin level being 12gm% in both sexes. 4.8% were severely anaemic (below 7%). Thus, the magnitude of the problem was moderate as per severity and high as per prevalence. The present study was completely a rural based study, thus the rural/urban variation might have affected the outcome. Microscopic examination revealed that about 50% elderly showed the features of iron deficiency anaemia. Anaemia significantly increased with age especially above 80 yrs. Therefore the present study made a strong case for taking appropriate intervention at the earliest for controlling/preventing anaemia in elderly to ensure an active ageing which in turn will further help in improving haemoglobin level in the elderly.

**Conclusion**

Elderly population constitutes 7.2% of the total population and mostly (90.4%) were anaemic showing a high prevalence of the same. The inadequate intake of pulses, green leafy vegetables and total calories intake needs to be improved. So it is suggested for implementation of iron supplementation and dietary intervention for the elderly.

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