Prevalence of Anemia in Adult Rural Population of North India

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Abstract

Objectives : To find the prevalence of anemia in adult males and non-pregnant females of rural north Indian population.

Methods : During an epidemiological survey on hypertension in rural population of north India (n=2559), a random sample of 215 individuals underwent blood investigations including hemoglobin estimation.

Results : The overall prevalence of anemia in 16-70 years of age group was 47.9% (n=215), being 50% (n=136) among females and 44.3% (n=78) among males. Low socioeconomic status, illiteracy and lower body mass index, were associated with higher prevalence of anemia.

Conclusions : The finding of higher prevalence of anemia in adult males need further investigation and corroboration in other studies. The intervention for anemia should be directed on the community as a whole.

INTRODUCTION

Anemia is one of the most common health problems in India.1,2 The problem is much more in rural than the urban areas.2 The high-risk groups for anemia are pregnant and lactating females and children.1,2 Prevalence in this subgroup has been found to vary from 50-90% in different parts of India.2 Almost all interventions at national and local level have focussed predominantly on these groups. Reliable data on the prevalence of anemia in adult population (non-pregnant females and adult males) is not available.2,3 During an epidemiological study on prevalence of hypertension in rural population,4 we studied prevalence of anemia among adult individuals.

MATERIAL AND METHODS

A house to house survey was carried out in seven villages of Raipur-Rani block in the district of Panchkula, Haryana state (India) from April 1994 to December 1995. The details of study population and methodology have been described elsewhere.4,5 In brief, out of total eligible population (n=2964) in 16-70 years age group, 2559 individuals were interviewed using pretested structured interview schedule. One hundred and fourteen individuals were detected to be hypertensive and age and sex matched controls were selected from the community by random numbers for blood sampling. Hemoglobin estimation was available on 215 individuals. Hemoglobin estimation was done by direct cyanmethemoglobin method. Anemia was defined as the hemoglobin of less than 13 g/dl in males and less than 12 g/dl in females.1,2 Mild anemia was defined as hemoglobin level of 10-12.9 g/dL in males and 10-11.9 g/dL in females, moderate anemia was defined as hemoglobin level of 7-9.9 g/dL and severe anemia was defined as hemoglobin level of less than 7g/dL both among males and females respectively. All individuals had their height and weight measured as per standard protocol.4,5 Body mass index (BMI) was calculated as weight in kilograms divided by square of height in meters. BMI was further categorized into low (<18.5 kg/m²), normal (18.5-24.9 kg/m²) and high (≥ 25 kg/m²) according to WHO criteria.6 The population was graded into sedentary, moderate and heavy activity groups according to their occupation.5 The socioeconomic status was based on total family income per month.5 Current users of any form of tobacco together with former smokers were classified as smokers.5 Subjects who had not received any formal education were classified as illiterate.5 Age-adjusted prevalence of anemia was calculated by direct standardization method.

RESULTS

The prevalence of anemia in 16-70 years age group was
The age-adjusted prevalence of anemia was 46.1%. The prevalence of anemia was higher among females than males (50% vs 44.3%, p >0.05, Table 1). The prevalence of mild anemia was higher (males 29.3%; females 32%) than moderate and severe anemia in this population. Prevalence of anemia was maximum (52.8%) in the age group of more than 45 years among males whereas among female subgroup, younger females (<30 years) had higher prevalence of anemia (55%, p >0.05, Table 1).

Both males and females who were illiterate, smokers, belonging to low socioeconomic status and having low or normal body mass index had higher prevalence of anemia (Table 2). Males who were engaged in heavy occupational related work activity had lower prevalence of anemia than males engaged in sedentary or moderate occupation-related work activity. No female was found engaged in heavy occupation-related work activity.

**DISCUSSION**

The present study has found high prevalence of anemia in 16-70 years age group of rural population of north India. The prevalence of anemia among females was 50% while among males it was 44.3%. According to WHO if the prevalence of anemia at community levels is more than 40%, it is considered as problem of high magnitude. This study thus brings out the fact that the problem of anemia is related to wider population than the traditionally considered groups of the pregnant and lactating females and children. The adult male population is equally susceptible. The prevalence of various parasitic infestations and other chronic illnesses were not studied in this survey so it is difficult to comment upon the causes of high prevalence of anemia in males. A peripheral blood film was also not made, which could have given an indication of the type of anemia in this population.

This study also highlights the facts that the prevalence of anemia was more in individuals belonging to low socioeconomic status group and individuals who were illiterate and having low body mass index. Although dietary habits were not studied in detail but it is likely that individuals in these groups take nutritionally deficient diet and are more susceptible to parasitic infestations and other chronic infections. Males doing heavy occupation-related work activity had lower prevalence of anemia. This may be due to the fact that individuals may be taking nutritionally rich diet that helps them in carrying out their heavy work activity. However more studies are needed to support or disapprove this observation. Contrary to the existing data, the smokers in this study had higher prevalence of anemia. The prevalence of smoking was found to be higher among individuals belonging to low socioeconomic status group as well as individuals who were illiterate. It is possible that higher prevalence of anemia in our study is related to the socioeconomic status rather than to smoking.

Although the present study was not designed specifically to study all the risk factors for anemia in this population, the lack of data on adult population and high prevalence of anemia among adult male population prompted us to publish our findings. There is a need for a systematic study to find out the frequency as well as the causes of anemia at community level both among males and females. These findings also suggest that intervention for anemia should be directed at all members of the community.

**Acknowledgement**

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**Table 1:** Age-group and sex-wise prevalence of anemia in rural population of north India, 1994-95

<table>
<thead>
<tr>
<th>Age-group (years)</th>
<th>Males n(%)</th>
<th>Females n(%)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>≥ 13</td>
<td>10-12.9</td>
</tr>
<tr>
<td>N 16-30</td>
<td>29(55.2)</td>
<td>9(31)</td>
</tr>
<tr>
<td>N 31-45</td>
<td>14(78.6)</td>
<td>2(14.3)</td>
</tr>
<tr>
<td>N ≥ 45</td>
<td>36(47.2)</td>
<td>15(41.7)</td>
</tr>
<tr>
<td>Total</td>
<td>79(55.7)</td>
<td>26(32.9)</td>
</tr>
</tbody>
</table>

Prevalence of anemia = 35(44.3%) in males and 68(50%) in females
REFERENCES


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Announcement

APICON 2004

Workshop-2 Critical Care Medicine, 20 Jan 2004, Time : 09.30 - 12.300 hrs, Hall D, Convenor : JMK Murthy, Hyderabad

Diadetic Lecturers
Arterial Blood Gas-Critical appraisal : Ram Rajagopalan, Chennai
Fluid and electrolytes : N Ramakrishnan, Chennai
Ventilation : R Sarnaik, Nagpur
Interactive Case Discussion : JMK Murthy, Hyderabad

Discussion of interesting cases with critical issues by a panel of critical care specialists with interaction from the floor. Cases from the following specialties will be discussed- pulmonary, neurology, infectious diseases, gastroenterology. (Dr. MK Daga, New Delhi will be one of the panelists)

Delegates are requested to register for the workshop in advance before 10 Jan 2004 as accommodation in the Hall will be restricted to 250-300 members. There will be no registration fee. Interested members/delegates are requested to contact Dr. JMK Murthy.

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Announcement

Second Annual Conference of the Association of Physicians of India, Jharkhand Chapter, will be held on February 21-22, 2004, JAPICON 2004 at Ramgarh.

For further details please contact: Dr. BK Mishra, Organising Secretary, JAPICON 2004, Sri Nath Niketan, Matwari, Hazaribag 825 301. Phone No. : 06546222879, Mobile : 9431141879, Fax : 06546224951, Email : dbrkmishra@rediffmail.com

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