A STUDY ON THE IMPACT OF VARIOUS INTERVENTIONS ON THE PREVALENCE OF NUTRITIONAL ANEMIA AMONG MEDICOS OF G.S.V.M. MEDICAL COLLEGE, KANPUR

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Abstract :

Research Question :

What is the impact of varius interventions on the prevalence of nutritional anemia among medical students?

Objectives :

1. To study the prevalence of nutritional anemia among medical students.

2. To study the impact of interventions like deworming, iron and folic acid supplementation and nutrition and health education on the prevalence of nutritional anaemia among medicos.

Study Design : Prospective study

Study Setting : Department of Community Medicine, GSVM Medical College, Kanpur

Study Subject : Under-graduate MBBS students belonging to admission years of 2000, 2001, 2002.

Study Period : March 2002 to May 2003

Study Variables : Age, sex, dietary habits, Hb - concentration

Statistical Analysis : Percentage and chi-square test.

Results :

Out of 496 volunteered students, 335 (67.5%) were males & 161 (32.5%) were females. Overall prevalence of anemia was 23.9% Among total anemic cases, 89.0% had mild grade anemia. Out of total anemic cases, 89.9% (males 84.4% & females 93.2%) were having nutritional anemia while 10.1% had non-nutritional anemia. Prevalence of nutritional anemia was 21.5% (42.8% in females& 11.3% in males). Nutritional anemia was 45.1% in vegetarians & 8.41% in non-vegetarians. Among 5.6% students with history of passing worms in stools, 46.4% were nutritionally anemic. At end of 3 months of first phase of interventions (Deworming + health and nutrition education) only 7.5% nutritionally anemic cases had shown increase in Hb concentration while at end of 6 months of second phase of interventions (iron & folic acid tablets supplementation + health and nutrition education), 78.5% anemic cases had shown increase in Hb concentration and became non-anemic. 12.85% nutritionally anemic cases remained anemic even after 6 months of interventions.

Introduction :

Nutritional anaemia has been defined by WHO as "a condition in which hemoglobin concentration of blood is lower than normal as a result of deficiency of one or more essential nutrients, regardless of the cause of such deficiency." In this condition, the hemoglobin concentration can be raised by supplementing haematinics.

Nutritional anaemia is a world wide problem with the highest prevalence in developing countries. It is especially found amoung women of child bearing age, young children and during pregnancy & lactation. By far the most frequent cause of nutritional anaemia is iron deficiency, less frequently folate and vitamin B 12 deficiencies. Iron deficiency results from inadequate nutrient intake or excessive loss of iron from the body. Poor bio-availability of iron, blood loss during menstruation, parasitic infections and birth of children at close interval of time are common causes of anaemia.

Among medical students, varied socio-economic background and dietary pattern is likely to have an impact over the nutritional status particularly nutritional anaemia. Against this background, the present study was carried out among the students of GSVM Medical College, Kanpur to assess the magnitude of nutritional anaemia and the impact of various interventions on its prevalence.

Material and methods:

The present study was carried out among the undergraduate MBBS students belonging to entrance year 2000, 2001 and 2002 from march 2002 to may 2003. The students were contacted during their respective lecture classes and were explained in detail about the aims and objectives of the study. Pre-designed and pre-tested questionnaire was distributed to get filled by students themselves. All quarries raised regarding the topic were discussed and settled on the spot.

Hemoglobin estimation of all the study population was performed to assess the status of anaemia by Sahli's method. Grading of anaemia was done according to DeMayer's (1989) criteria---

Grades of Anemia	Hb Concentration (gm/dl)
Mild	10 - 12 (Females)
	10 - 13 (Males)
Moderate	7 - 10
Severe	<7

Nutrition & health education and administration of one dose of deworming drug (Albendazole 400 mg) to all the students constituted initial intervention. Repeat hemoglobin estimation was done 3 months later in students diagnosed initially as nutritionally anemic. The nutritionally anemic students were now given iron and folic acid tablets for 3 months and simultaneously health and nutrition education was continued as earlier. Again 3 months later (6 months from the baseline) repeat hemoglobin estimation was done.

Observation & Discussion :

Out of 496 volunteered students, 335 (67.5%) were males & 161 (32.5%) were females. Among them, 10.6% were in the age-group less than 20 years, 88.1% were in the age-group 20-25 years and 2.3% aged more than 25 years.

TABLE - 1

Sex wise prevalence of anemia in the study population

Sex	Anemia cases		Non-Anemia cases		Total	
	No.	%	No.	%	No.	%
Male	45	13.4	290	86.6	335	100.0
Female	74	45.9	87	54.1	161	100.0
Total	119	23.9	377	76.1	496	100.0

$\chi^2 = 63.1$ d.f.=1   p<0.05

Table-1 shows that anemia was highly prevalent in females (45.9%) as compared to males (13.4%). This difference in relation to sex was found to be statistically significant (p<0.05). Rawat et al (2000) has reported 34.5% prevalence of anaemia in adolescent girls.

The majority of the anemic students (89.0%) had mild grade anemia while 11.0% had moderate anemia. None of the anemic student was found to be severely anemic.

Higher proportion of females (14.9%) had moderate degree of anemia as compared to males (4.5%) The proportion of mild, moderate and severe anaemia as reported by rawat et al (2002) in adolescent girls was 55.2%, 40.8% and 4.0% respectively. The National Pilot programme on control of micronutrients (2000) reported prevalence of mild & moderate anemia taken together in 19-45 years females as 82.7% and severe anemia as 6.4%.

TABLE - 2

Distribution of anemia cases according to type of anemia

Type of Anemia	Males		Females		Total	
	No.	%	No.	%	No.	%
Nutritional	38	84.4	69	93.2	107	89.9
Non-nutritional	7	15.6	5	6.8	12	10.1
Total	45	100.0	74	100.0	119	100.00

$\chi^2 = 2.36$ d.f. =1   p>0.05

Table-2 shows that among total 119 cases of anemia, majority (89.9%) were suffering from nutrtional anemia and

remaining (10.1%) from non-nutritional. This difference in distribution of anemia cases in relation to sex was statistically insignificant (p>0.05).

TABLE - 3
Sex wise prevalence of nutritional anemia in students

Sex	Students with nutritional anemia		Students without nutritional anemia		Total	
	No.	%	No.	%	No.	%
Male	38	11.3	297	88.7	335	100.0
Female	69	42.8	92	57.2	161	100.0
Total	107	21.5	389	78.5	496	100.0

$\chi^2 = 85.9$ d.f. = 1 $p < 0.05$

Table-3 shows that prevalence of nutritional anemia was higher in females(42.8%) as compared to males (11.3%). The association between nutritional anemia and sex was found to be statistically significant ($p < 0.05$).

TABLE - 4
Prevalence of nutritional anemia in study population according to type of diet

Type of diet	Students with nutritional anemia		Students without nutritional anemia		Total	
	No.	%	No.	%	No.	%
Vegetarian	80	74.76	97	24.93	177	35.6
Non-vegetarian	27	25.23	292	75.06	319	64.4
Total	107	100	389	100	496	100.0

$\chi^2 = 90.7$ d.f.=1 $p < 0.05$

Table-4 shows that the prevalence of nutritional anemia was much higher (45.1%) in vegetarians as compared to (8.4%) in non-vegetarians. This difference in relation to the type of diet consumed was found to be statistically significant (p<o.o5). The higher prevalence of anemia in vegetarians could be due to poor bioavailability of non-heme iron and presence of inhibitors of iron absorption in vegetarian food and other unexplained factors.

TABLE - 5
Prevalence of nutritional anemia according to history of passing worms

History of passing worms	Students with nutritional anemia		Students without nutritional anemia		Total	
	No.	%	No.	%	No.	%
Present	13	46.4	15	53.6	28	100.0
Absent	94	20.0	374	80.0	468	100.0
Total	**107**	**21.5**	**389**	**78.5**	**496**	**100.0**

$x^2 = 10.8$ d.f.=1 $p<0.05$

In table-5, prevalence of nutritional anemia was higher (46.4%) in those with history of passing worms than those with no history (20.0%). This difference was found to be statistically significant (p<0.05). The parallel observation was found by Rawat et al (2000) who reported 53.6% of the prevalence of anemia in those adolescent girls who had history of worm infestation.

TABLE - 6
Distribution of nutritionally anemic students responding to various interventions during follow-up

Stages of follow up	Males (n=38)		Females (n=69)		Total (n=107)	
	No.	%	No.	%	No.	%
Increase in Hb at end of 3 months following first phase of interventions	9	23.7	14	16.8	23	21.5
Increase in Hb at end of 6 months following second phase of interventions	34	89.5	60	86.9	94	87.9

Table - 6 shows that at the end of three months, 23.6% the males and 16.8% of females showed and increase in Hb concentration following the first phase of interventions (deworming and nutritional & health education). Overall 21.5% showed an increase in Hb concentration at the end of 3 months. At the end of 6 months following second phase of interventions (iron & folic acid tablets supplementation and nutritional & health education), 87.9% of anemic students showed increase in Hb with males 89.4% & females 86.9% Rest of the 13 students (12.1%) showed no increase in Hb.

TABLE -7

Impact of various interventions on nutritional anemia in the study group

Sex	Nutritionally anemic students before the interventions		Nutritionally anemic students after the interventions	
	No.	%	No.	%
Males	38	35.5	4	10.53
Females	69	64.5	9	13.04
Total	107	100.0	13	12.15

Table - 7 shows that even after 6 months of interventions, 4 (10.5%) of nutritionally anemic males remained anemic as compaered to 9 (13.04%) of nutritionally anemic females. Overall 12.15% remained anemic even after interventions while other 87.85% attained normal hemoglobin level.

Recommendations :

In the light of the findings of the present study, following measures can be suggested for the prevention & control of nutritional anemia among the medical students.

1. Hemoglobin estimation of the medical students at the time of entrance to Medical College and later on at appropriate intervals.

2. Procurement and distribution of deworming drugs and iron and folic acid tablets in therapeutic doses to the cases suffering from the nutritional anemia.

3. Efforts to motivate medical students for the intake of balanced diet by making change in their dietary pattern.

4. Health & nutrition education to be imparted among the youngsters especially females regarding prevention of anemia

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