

Prevalence of anemia in Shkodra district

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Abstract

Aim: Anemia defined as a low blood haemoglobin concentration. This disease is more prevalent in developing countries and is considered of public health significance. While the etiology of anemia is multifactorial, iron deficiency is the most commonly recognized nutritional cause. The aim of this study was to estimate the prevalence, number of persons affected and factors associated with this disease in Shkodra district.

Methods: We analyzed data from the longitudinal medical record reviews of 180 persons who received medical care from January 2013 through April 2015 in clinics and hospitals in Shkodra district. We used a standardized questionnaire to collect the data. Each hemoglobin level of <10 g/dL was defined as an anemia case.

Results: The prevalence of anemia was 18.3% in all age groups. The minimum age was 1 year old and the maximum age was 88 years old. The prevalence resulted 5.5% in men and 12.8% in women, with no significant association between them. We found a significant association between demographic factors and other risk factors related to anemia such as age, unemployment, presence of parasites and hypertension.

Conclusion: The prevalence of anemia in our study resulted to be very high. This prevalence was concentrated more in preschool-aged children, pregnant women and elder persons. It is a major problem with impacts on social and economic development. Early detection and effective management of anemia during pregnancy can lead later to substantial reduction of under-nutrition in childhood, adolescence and improvement in adult height.

Keywords: anemia, prevalence, Shkodra.

Introduction

Anemia is a condition in which the number of red blood cells (and consequently their oxygen-carrying capacity) is insufficient to meet the body's physiologic needs. Specific physiologic needs vary with a person's age, gender, residence, smoking behavior, and different stages of pregnancy. Iron deficiency is thought to be the most common cause of anemia globally, but other nutritional deficiencies (including folate, vitamin B12 and/or combination of both), acute and chronic inflammation, parasitic infections, and inherited or acquired disorders that affect hemoglobin synthesis, red blood cell production or red blood cell survival, can all cause anemia (1,2). Iron deficiency is the most common and widespread nutritional disorder in the world, and is a public health problem in both industrialized and non-industrialized countries (3). Anemia prevalence is higher in pre-school children, pregnant women and also elders. While the etiology of anemia is multi-factorial, iron deficiency is the most commonly recognized nutritional cause. Iron deficiency is generally assumed to be the major cause of anemia globally (4,5). The detrimental public health effects of iron deficiency include anemia, decreased intellectual and work performance, as well as functional alterations of the small bowel (6).

Methods

We analyzed data from the longitudinal medical record reviews of 180 persons who received medical care for problems with anemia from January 2013 through April 2015 in clinics and hospitals in Shkodra district. Each hemoglobin level of <10 g/dL was evaluated as an anemia case. Data were collected after taking informed consent. Participants were interviewed using a standardized

questionnaire, which contains socio-demographic characteristics (age, education, occupation, marital status, monthly income, etc), and risk factors associated with anemia among population of Shkodra district. Data were analyzed using SPSS, version 19. The means, frequencies, and rates of the given data were calculated for each variable. Proportions and chi-square test were used too. A p-value of less than 0.05 was considered as statistically significant, and adjusted odds ratios with 95% CIs were calculated to determine the associations.

Results

The prevalence of anemia was 18.3% in all age groups. In Figure 1 we have presented the distribution of types of anemia in our study. Iron deficiency has a high prevalence among other types in 30.31% of all cases. Folate deficiency was in 21.21%, B12 deficiency in 12.12%, combination of folate and B12 deficiency in 6.06%, iron with folate or B12 or both in 15.15%. Unexplained anemia was seen in 15.15% of all cases.

The minimum age was 1 year old and the maximum was 88 years old with an average of 32.7 years. The prevalence in men resulted 10 (5.5%) persons and in women 23 (12.8%) persons with no significant difference between them. We have categorized our sample into 3 age groups. In the first, we have included children ≤ 15 years old, in the second group were included all persons from 16 until to 45 years old and in the third group there were included persons from 46 until to 88 years old. The prevalence was 40.6% in the category of children, 42.3% in the second category and 10.1% in the third category of age, with a significant association for third category ($P < 0.05$). In Table 1 we have presented the socio-demographic data of the study samples (sex, age, marital status, educational level, employment status and family income).

Figure 1. Distribution of types of anemia in the study population

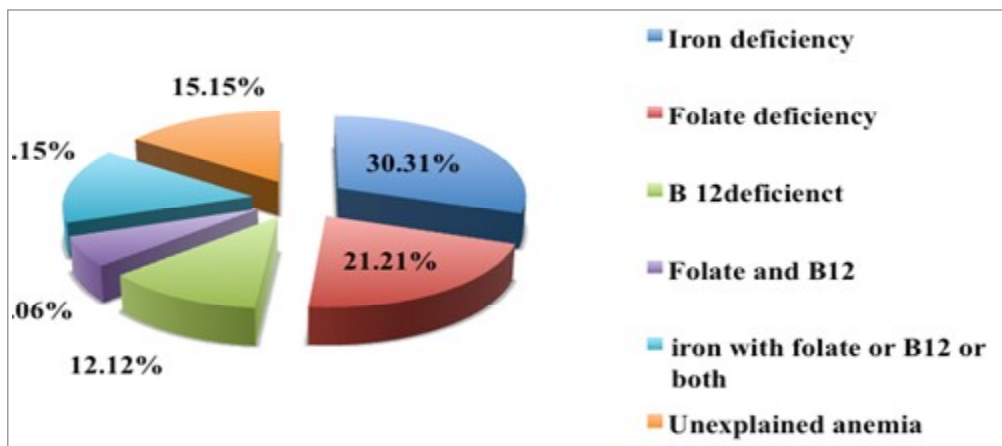


Table 1. Socio-demographic characteristics of the study population

Characteristics	Number of individuals	Persons with anemia	Odds ratio (95%CI)	P-value
Sex				
Men	57	10	1 (reference)	
Women	90	23	0.61 0.27 to 1.42	p=0.25
Age				
≤ 15 years old	45	13	1 (reference)	
16-45 years old	37	11	0.96 0.37 to 2.49	p=0.93
≥46 years old	98	9	4.01 1.56 to 10.29	p=0.0038
Residence				
Urban	79	13	1 (reference)	
Rural	101	20	0.76 0.35 to 1.64	p=0.49
Marital status				
Married	121	19	1 (reference)	
Unmarried	59	14	0.56 0.25 to 1.21	p=0.14
Education level				
University	31	4	1 (reference)	
High school	114	18	0.79 0.24 to 2.53	p=0.69
≤ 8 years	35	11	0.32 0.09 to 1.15	p=0.08
Employment				
Employed	49	3	1 (reference)	
Unemployed	70	24	0.12 0.0035 to 0.44	p=0.0013
Retired	61	6	0.60 0.14 to 2.56	p=0.49
Family monthly income				
High level	39	5	1 (reference)	
Middle level	52	10	0.61 0.19 to 1.97	p=0.41
Low level	89	18	0.58 0.0.19 to 1.69	p=0.31

In Table 2 we present the data in relation to factors associated with anemia. We found a significant association between some risk factors related to

anemia such as the presence of parasites and presence of hypertension.

Table 2. Logistic regression of risk factors associated with Anemia

Characteristics	Number of individuals	Persons with anemia	Odds ratio (95%CI)	P-value
<i>Eating animal products</i>				
No	69	16	1 (reference)	
Yes	111	17	0.578 0.28 to 1.20	p=0.14
<i>Eating green leafy vegetables</i>				
No	46	12	1 (reference)	
Yes	134	21	1.89 0.84 to 4.25	p=0.12
<i>Pregnancy</i>				
No	153	27	1 (reference)	
Yes	27	6	0.75 0.27 to 2.03	p=0.57
<i>Presence of parasites</i>				
No	146	22	1 (reference)	
Yes	34	11	0.37 0.158 to 0.86	p=0.022
<i>Presence of hypertension</i>				
No	91	8	1 (reference)	
Yes	89	25	0.246 0.104 to 0.583	P=0.0014
<i>Presence of cardiovascular diseases</i>				
No	126	24	1 (reference)	
Yes	54	9	0.85 0.36 to 1.97	p=0.70
<i>Presence of diabetes</i>				
No	113	20	1 (reference)	
Yes	67	13	0.89 0.41 to 1.93	p=0.79
<i>Presence of other diseases</i>				
Yes	143	26	1 (reference)	
No	37	7	0.95 0.37 to 2.40	p=0.91
<i>Presence of intervention during last years</i>				
No	148	25	1 (reference)	
Yes	32	8	0.60 0.24 to 1.51	p=0.28
<i>BMI/Kg cm²</i>				
<25	65	10	1 (reference)	
25-<30	76	14	0.80 0.33 to 1.95	p=0.63
>30	39	9	0.60 0.22 to 1.65	p=0.32
<i>Family history</i>				
No	82	11	1 (reference)	
Yes	98	22	0.53 0.24 to 1.18	p=0.12

Discussion

The prevalence of anemia in this study resulted 18.3% in all age groups. This prevalence was low compared to another study carried out in 2005. Prevalence of anemia in this study was 42.0% (7). In our study prevalence in women was higher compared to men, 12.8% and 5.5% respectively, with no significant association between them.

Iron deficiency is generally assumed to be the major cause of anemia globally (4,5) and affecting a large number 30-40% of children and women in industrialized countries (8,9). Other factors associated with anemia include nutritional deficiencies involving other micronutrients (folate, and vitamin B12), infectious and parasitic diseases (e.g., diarrhea, protozoa, geohelminthosis), glucose-6-phosphate dehydrogenase (G6PD) deficiency, and genetically derived hemoglobinopathies (10-12). In our study Iron deficiency was higher compared to other types of anemia in 30.1% of all cases. A high prevalence was seen also for folate and B12 deficiency in 21.21% and 12.12% respectively. Unexplained anemia was observed in 15.15% of all cases.

This study presents a large interval of age from 1 year old as a minimum age until the maximum age of 88 years old. In our study, the prevalence of anemia in children aged 1-15 years resulted 40.6%; in the second category of 16-45 years old, the prevalence was 42.3%; and in the third group of 46-88 years old, the prevalence resulted 10.1%. More studies worldwide have observed an association between anemia and child's age (11,14,15). This disease in children most often is being associated with parasitic diseases, malnutrition, living conditions, and sanitation. Fomon et al., in their study have reported that during infancy, early childhood and adolescence, there is a high risk for developing iron deficiency, due to a combination of menstrual iron losses in girls and a rapid

physical growth, especially in boys (16). In our study a significant association was seen in the third age category for $p=0.0038$ with odds ratio [1.56 to 10.29 for 95% CI].

With regard to socioeconomic characteristics, the results of our study indicate that education level and family monthly income were shown to be protective factors for the occurrence of anemia. Other studies have documented that those factors are intimately related to the care received, nourishment and access to health services (11,14,15,17). Also in our study, education level and high monthly income were shown to be protective for the occurrence of anemia. We have found a significant association only for persons that were unemployed with p value 0.0013 and odds ratio [0.0035 to 0.44 for 95% CI].

Regarding the risk factors for occurrence of anemia, we found a significant association between presence of parasites and hypertension, but we did not find any association for the other risk factors shown in Table 2.

Obesity has been reported to be associated with anemia in adults in some countries (18-24), which may be due to the up-regulated hepcidin expression thereby hampering iron absorption (25). In our study, we did not find any association between these anthropometric indices and anemia.

Conclusion

Prevalence of anemia in our study resulted to be very high. This prevalence is concentrated more in preschool-aged children, pregnant women and elder persons. It is a major problem with impacts on social and economic development. Early detection and effective management of anemia in pregnancy can lead later to substantial reduction in under-nutrition in childhood, adolescence and improvement in adult height.

Conflicts of interest: None declared.

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