FREQUENCY OF ANEMIA IN KING KHALID GENERAL HOSPITAL IN ALMAJMA'AH (INDOOR AND OUTDOOR PATIENTS)

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ABSTRACT

Background and purpose: Anaemia is a disease prevalent worldwide, effects all age groups, and almost all countries are affected heavily, according to WHO 24.8% (1.62 billion people) of the population is effected worldwide.[1] This study was taken with above background, to know the frequency of anaemia in patients visiting King Khalid General Hospital in Almajma'ah in Riyadh province. **Methods:** It was an observational cross – sectional Hospital based study. The data was collected from the patients who attended the outpatient and inpatient departments in king Khalid hospital of Majma'ah, the data of the samples was collected by using results of each patient from his laboratory investigations which include total red blood cells, MCV, MCH, MCHC, RWD, HCT, hemoglobin level, RBC morphology and related RBC indexes. **Result:** At the time of diagnosis out of 200 cases there are 81 cases of anemia (aged from 14 – 85 years old) present in KKGH in Majma'ah. And out of 81 anemic patients there are 57 female patients aged from 16 – 60 years old, and rest 24 anemic patients represent males patients aged from 14 - 85 years old. **Conclusion**: our study shows high incidence of anemia in patients visiting KKGH. And it needs a larger and broader study to have accurate prevalence of anemia and also to know its types so that preventive and curative measures can be adapted.

KEYWORDS: Anemia, Hematological Parameters, Majma'ah University.

BACKGROUND AND PURPOSE

Anemia is a common finding in the world population, affecting both developing countries and industrialized nations. It reaches high levels according to data from the World Health Organization-WHO. Because of such magnitude, it is considered a public health problem. It can greatly affect a person's life, especially in its more severe forms. Anemia causes tiredness, weakness, malaise, and making routine tasks more difficult and painful.[1] Among the numerous factors, both nutritional (such as vitamin and mineral deficiencies) and non-nutritional (such as infection and hemoglobinopathies), that contribute to the onset of anemia, iron deficiency and malaria play an important role. Given the role of iron in oxygen transport and the low levels of available iron in the diets of a large proportion of the global population, it is assumed that iron deficiency is one of the biggest contributing factors to the global burden of anemia. Iron deficiency is considered one of the ten leading global risk factors in terms of its attributable disease burden.[2] Among the other causes of anaemia, heavy blood loss as a result of menstruation, or parasite infections such as hookworms, ascaris and schistosomiasis can lower blood haemoglobin (Hb) concentrations. Acute and chronic infections, including malaria, cancer, tuberculosis, and HIV can also lower blood Hb concentrations.[3] Normal Hb distributions vary with age, sex, and physiological status, e.g., during pregnancy.[4] The affected person may be drowsy, with less resistance to physical activities and deterioration in cognitive function and immunity.[5] Globally, anaemia affects 1.62 billion, which corresponds to 24.8% of the population. The highest prevalence is in preschool-age children (47.4%), and the lowest prevalence is in men (12.7%). The highest proportion of individuals affected is in Africa (47.5–67.6%).[6] The prevalence of anemia in an elder population of both women and men of Saudi is 12.9%.[7] And the overall prevalence of anaemia in Saudi children was 24.8. A few isolated reports indicate that anaemia occurs at a high prevalence rate in Saudi Arabia though the actual prevalence in several regions is not known.[8] The present study was aimed to determine the frequency of anemia in patient visiting King Khalid General Hospital in Almajma'ah in Riyadh province.

MATERIAL AND METHODS

It was an observational cross – sectional Hospital based study. The study was conducted in King Khalid Hospital, Almajmaah, Kingdom of Saudi Arabia. The population of the Majmaah city is around 45,000. The inclusion criterion was patients of either sex on

outpatient and inpatient department between age group of 14 – 85 years. The data was collected randomly from 200 patients (of which 117 were females and 83 were males) who attended the hospital by using results of each patient from his laboratory investigations which include total red blood cells, MCV, MCH, MCHC, RWD, HCT, hemoglobin level, RBC morphology and related RBC indexes. And the WHO's Hemoglobin thresholds were used in this study to define and diagnose anemia.[9] Complete enumeration sampling method from 13 October 2012 – 17 October 2012 i.e. for a period of 1 week. The data was entered and analyzed using SPSS 20.0. Mean $\pm$ S.D was given for quantitative variables like age etc. Frequencies and percentages were given for qualitative variables. Pearson correlation was applied to observe correlations between quantitative variables. Two independent sample tests was also applied to compare the indices between males and females. A p-value of <0.05 will be considered as statistically significant.

RESULT

After collecting samples for one week the frequency of anemia was 40.5%, including all age groups. The average age of patients was 41.0 ± 23.52 years. Majority of the patients were females 57 (70.4%) as compared to males 24 (29.6%). Significant positive correlation was observed between age and MCV (r=30.7, p=0.005), MCH (r=31.3, p=0.003) and MCHC (r=25.1, p=0.024) showing that MCV, MCH and MCHC increases with increase in age. Significant positive correlation was observed between RBC and HGB (r=57.5, p=<0.001), HCT (r=77.7, p<0.001) showing that HGB and HCT increased with increase in RBC, however, significant inverse correlation was observed between RBC and MCV (r=-74.3, p<0.001), MCH (r=-71.6, p<0.001) and MCHC (r=-41.4, p<0.001) showing that MCV, MCH and MCHC decreased with increase in RBC or vice versa. HGB was significantly positively correlated with HCT (r=92.8, p<0.001) showing that HCT increased with increase in HGB. Significant inverse correlation was observed between HCT and MCV (r=22.4, p=0.04) showing that MCV decreases with increase in HCT or vice versa. Significant positive correlation was observed between MCV and MCH (r=96.4, p<0.001) and MCHC (r=49.9, p<0.001) showing that MCV increase with in MCH and MCHC. Similarly, significant positive correlation was also observed between MCH and MCHC (r=66.0, p<0.001) showing that MCHC increased with increase in MCH. RDW was not significantly correlated with age, RBC, HGB, HCT, MCV, MCH and MCHC (p>0.05) respectively.

Significant difference was observed between MCV and MCH of males and females, showing that MCV and MCH of males was higher than that of females p<0.05 respectively. However, no significant difference was observed between the RBC, HGB, HCT, MCHC and RDW of males and females (p>0.05) respectively.

MCV values show 34 (45.7%) patients had MCV levels <80 fL which represent microcytic anemia, and 44 (54.3%) patients had MCV levels >= 80 fL which represent normocytic anemia.

Table. 1: RBC Indices.

	Mean $\pm$ S.D n = 81
RBC	3.776 $\pm$ 0.86
HGB	8.911 $\pm$ 1.44
HCT	28.91 $\pm$ 4.55
MCV	79.11 $\pm$ 10.53
MCH	24.55 $\pm$ 4.29
MCHC	30.75 $\pm$ 2.23
RDW	15.38 $\pm$ 3.46

**Table. 2: Comparison of RBC indices between males and females.**

	Males Mean $\pm$ S.D n = 24	Females Mean $\pm$ S.D n = 57	p-value
RBC	3.50 $\pm$ 0.90	3.88 $\pm$ 0.83	0.072
HGB	8.70 $\pm$ 1.61	8.98 $\pm$ 1.36	0.615
HCT	28.08 $\pm$ 4.62	29.27 $\pm$ 4.63	0.270
MCV	83.3 $\pm$ 11.53	77.39 $\pm$ 9.51	**0.019***
MCH	26.28 $\pm$ 4.71	23.81 $\pm$ 3.53	**0.035***
MCHC	31.08 $\pm$ 2.95	30.41 $\pm$ 2.22	0.106
RDW	15.68 $\pm$ 4.61	15.26 $\pm$ 2.81	0.639

*shows statistically significant result

Table. 3: Reference values for erythrocytes, hemoglobin, hematocrit, MCV, MCH, and MCHC according to age.[10]

Age	Hemoglobin (g/dL)	Hematocrit (%)	MCV (u^3)	MCH (ng)	MCHC (%)	RDW (%)
14 years	13.5–14.5	40–50	82–92	28–30	32–36	11.5 – 14.0
Adult men	14–16	40–54	82–92	27–32	32–36	11.5 – 13.1
Adult women	11–14	37–47	82–92	27–32	32–36	11.5 – 13.1
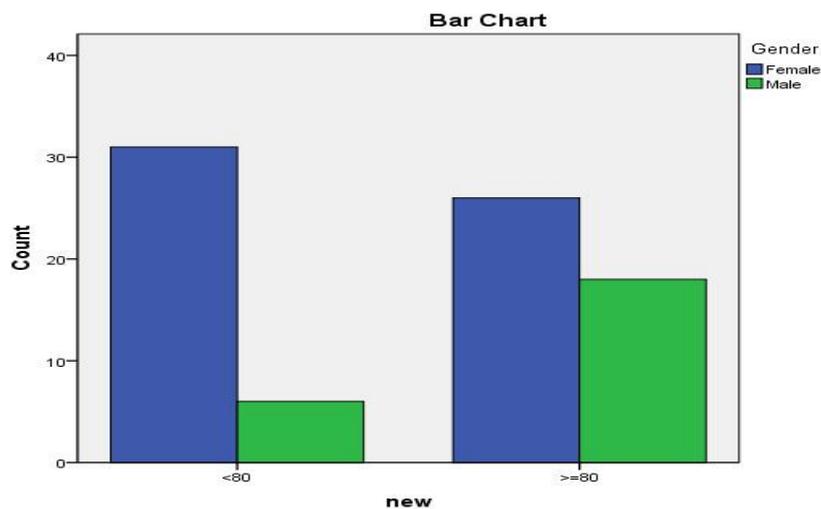
Chart. 1: shows MCV values <80 and >= 80, and comparison male and female.

DISCUSSION

The anemia incidence found in nearly in 40.5% of our study is high and it approaches those values found in the world: 24.8% of its population were affected by anemia.[6] Such clinical manifestation can affect quality of life by decreasing exercise tolerance, impairing learning ability, affecting libido, causing fatigue, discomfort, and reducing appetite among other changes. Anemias do not spare more affluent social classes. And the high number of anemia cases found in the study population proves that it is a public health problem: anemias are the most prominent endemic deficiency, overcoming the lack of iodine (which is currently under control), vitamin A, and even protein-calorie malnutrition.[11] The values of hemoglobin and hematocrit found in patients with anemia in the study population characterize that clinical manifestation as moderate in most cases and in all ages. There were few cases severe anemia, which responded promptly to therapy with oral or parenteral replacement of iron. The WHO defines mild, moderate, and severe anemia according to hemoglobin values. Mild anemia is characterized by hemoglobin values between 11.0 and 11.9 mg/dL in children and adult women and between 12 and 12.9 mg/dL in adult men. Moderate anemia occurs when hemoglobin values vary from 8.0 to 10.9 in children and adult women, and from 9.0 to 11.9 in adult men, and severe anemia has hemoglobin values from 5.0 to 7.9 in children and adult women and from 6.0 to 8.9 in adult men.

Lack of additional laboratory tests such as TIBC and ferritin make a barrier for us to determine which type of anemia is the predominant in the patients.

CONCLUSION

The high frequency of anemia in our study population follows what can be seen worldwide. This clinical manifestation does not discriminate between rich or poor countries and affects a great number of people in several nations. A person's life can be greatly disturbed by its symptoms, such as tiredness, lower immunity, impairment in the growth of children, and in cognitive functions. Broader studies must be done in this medical condition especially in KSA, because no validated study – up till now- had been conducted with accurate prevalence for this public health problem.

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