

A Comparative Study of Anemia in Adult Women of Telangana Population

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How to cite this article: Reyya Mohan Sundar, Makandar. U.K. A Comparative Study of Anemia in Adult Women of Telangana Population. Indian Journal of Public Health Research and Development 2023;14(2).

Abstract

Background: Anemia is still a major health problem in females of both rural and urban areas of the developing countries like India. The objective of the present study was to find out the hematological parameters and blood indices among adult females in rural and urban areas of Patancheru (Mandal), Telangana and correlate to type of anemia, degree of anemia, and percentage of anemia in both rural as well as urban areas in adult females.

Methods: A cross-sectional study was conducted among adult female subjects of age group 18-35 years comprised of n=100 subjects selected from rural area and n=100 subjects from urban areas of Patancheru (Mandal), Telangana. The hematological parameters, Hb gm%, MCV (fl), RBC count/mm³, MCH(pg), PCV(%), MCHC(gm/dl) were investigated by Hematology Analyzer-automated blood counter.

Results: among the total sample of n=200 adult female subjects of age group 18-45 years, the overall prevalence of anemia was observed 58%, recording 60% in rural area females and 56% in adult female subjects of urban area. The overall microcytic anemia was observed maximum (40%), recording 70% in rural area subjects and 67% in urban area subjects. The overall macrocytic and normocytic anemias were recorded 9% each. The macrocytic anemia was recorded 13.5% in rural area and 17.8% in urban area. The normocytic anemia's was recorded 16.6% in rural area and 14.2% in urban area adult females. Both parameters of urban and Rural females were compared and there was highly Significant P Value (P<0.001).

Conclusion: The present study indicated that prevalence of anaemia is slightly higher among rural adult female subjects of age group 18-35 years compared to urban area female subjects. The current study results suggests, need of due emphasis on iron and folic acid supplementation and education on consumption of iron rich foods, so as to bring down the prevalence of anemia among the adult females

Keywords: Anemia, Hematological parameters, Adult female, Telangana.

Introduction

Anemia appeared as a serious public health

problem throughout the world. Particularly in developing countries^{1,2}. WHO estimate the number

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of anemic people worldwide to be a staggering two billion i.e. 27% of the world's population had anemia in 2019³. It is also estimated that one third of all women of reproductive age are anemic⁴. The world health organization (WHO) reported that 58% of the pregnant women with anemia were also anemic before being pregnant⁵. Prevention of anemic in adult women could the health status of the pregnant women, eventually contributing to the reduction of both maternal and perinatal mortality.

Anemia's are major health problem in females of reproductive age women, in developing and developed countries of the world. In India, more than 50 % of all the females are suffering from anemia both in rural as well as urban areas. The most common type by which females of reproductive age women are suffering are "iron deficiency anemia vitamin B12 and folic acid deficiency anemia's, anemia's due to blood loss and hemolytic anemia's. These anemias are categorized as microcytic anemias, macrocytic anemia's, and normocytic anemia's. Microcytic anemias is iron deficiency anemia, commonly occurring in females of reproductive age women in India. Macrocytic anemia are vitamin b12 or folic acid deficiency anemia's, also occurring in females of reproductive age group map normocytic anemia's occurring in females of are due to blood loss of hemolytic anemias. In India more than 50% females are reproductive age women are suffering from iron deficiency which is a type of microcytic anemia. Iron deficiency anemia's are majorly due to dietary deficiency, hookworm infestations, nutrition, blood loss depletion of iron store due to increased physiological demands in reproductive age. ⁶

The type of anemia occurring in rural and urban females is categorized by these blood indices (MCV), (MCH), (MCHC). MCV measures the average volume of red blood cell and is the indicator of RBC size and discriminate between microcytic and macrocytic anemias. microcytic anemias have small RBCs and decreased MCV. Microcytic anemia's reflected low MCV due to defective Hb% production either from ineffective haem or globin synthesis.⁷

Hence attempt is made to find out the hematological parameters such as Hb(gm%), total RBC count (mm³), and packed cell volume (PCV%)

among adult females of age group 18-35 years in rural and urban areas of Telangana.

Material and Methods

The study sample and population and sample size included adult females of age group 18-35 years considering n=100 subjects(cases) in rural area and n== 100 subjects in urban area.

The subjects in the area of UHC(urban health centre) and RHC(rural health centre) under TRRIMS medical college, Patancheru, Telangana were studied

Inclusion criteria : Normal adult non-pregnant females of age group between 18-35 years. Were selected for study

Exclusion Criteria: Pregnant women, elderly women, children, females suffering from hematological disorders, leukemia, myeloproliferative disorders.

Method: The study design was cross-sectional study using simple random sampling. Appropriate sample size was taken the study was conducted for a period of one year. The study variables included age, gender, marital status, education, family background, nutrition, income.

Procedure: A sterile 5ml syringe was taken for collection of blood sample following strict aseptic measurements of venous blood samples were collected into anticoagulant (EDTA) added in sample tubes. The hematological parameters such as hemoglobin (gm%) total RBC count/mm³, pcv% were investigated. blood indices like MCV(fl), MCH(pg), MCHC(gm/dl) were calculated. All the above hematological parameters were analyzed by hematology analyzer-automated blood cell counter (SYSMEX XP-100) in the central laboratory of TRRIMS.

Statistical Analysis: The statistical analysis of data is correlated to distribution and percentage of anemia, degree of anemia, types of anemia in both rural and urban areas compared, which helps to preventive, differentiating and diagnostic aspects of anemias. Mean values of various hematological parameters were compared with Z test and Anova test the statistical analysis was done by using SPSS software version-20 and Ms excel-2007.

Observation and results

Table-1 Comparison of hematological parameters and blood indices in adult female subjects of age group (18-35yrs) between anemic and non-anemic in rural population

mean value of Hb(gm%) 9.97, (SD± 0.997) in anemic and 12.56 (+- 0.39) in non-anemic women and $p < 0.01$. the mean value of RBC(millions/mm³) 4.390(SD+ .03745 in anemic and mean value 4.41 (SD ± 0.2412) in non-anemic and $P < 0.001$ (P value is highly significant). Mean value of pcv(%) 34.507, SD ± 3.4494 in anemic and 40.710 in anemic and (SD ± 2.0201) in non-anemic women and $P < 0.001$ (P-value is highly significant).

Mean value MCV(fl)78.500,SD ± 11,5021 in anemic and 91.084(SD ± 11.5021 in anemic and 91.084(SD ± 3.8429) in non-anemic women and $p < 0.001$ (p value is highly significant)

Mean value of MCH(pg) 22,667, SD ± 3.5706 in anemic and 28.130 (SD ± 1,4357) in non-anemic women, $p < 0.001$ (p-value is highly significant)

Mean value of MCHC(gm/dl) 28.840(sd+-2.4319) in anemic and 31.340(SD ± 2.0187) in non-non anemic women and p value is $p < 0.001$ (p-value is highly significant)

Table-2 Comparison of hematological parameters in both rural and urban females

Mean value of Hb(gm%) 10.15 (SD ± 0.532) in anemic and 12.56 (SD ± .645) in non-anemic-women and $P < 0.001$, (Pvalue is highly significant)

Mean value of RBC(millions/mm³) 7.378(SD ± 10.6352) in anemic and 4.318(SD ± 0.3002) in non-anemic women and p value 0.185(p value not significant)

Mean value of PCV(%), 35.696, SD ± 3.0789 in anemic and 38.932(SD ± 2.4396) in non anemic women and $p < 0.001$, p-value is highly significant.

Mean value mcv(fl) 79.568(SD ± 12.2190) in anemic and 89.609 (SD ± 3.7369) in non-anemic women, $p < 0.001$, (p value is highly significant)

Mean value of MCH(pg)22.529,(SD ± 3.3554) in anemic and 28.882(SD ± 1.61120 in non-anemic women, $p < 0.001$ (p-value is highly significant)

Mean value MCHC(gm/dl) 28.971,(SD ± 2.3442) in anemic and 32.505(SD ± 1.8123) in non-anemic, P value is < 0.001 is highly significant.

Table-3 Comparison of hematological parameters by Anova test

The parameters including Hb gm%, RBC mm³, PCV%, MCV(fl), MCh(pg), by Anova-analysis and observed highly significant P-value ($P < 0.001$)

Table-4 The percentage of anemia in rural and urban adult female population compared. In rural 66% were anemic and among them microcytic anemia were 70%, macrocytic anemia were 13.5% and normocytic anemia 66.6% and non-anemic females were 14%. In urban area 56% were anemic among them 67.8% had microcytic anaemia 17.8% macrocytic anemia 14.2%, normocytic anemia and 44% were non-anemic.

Table-1: Comparison of haematological parameters in females of age group (18-35y) between anemic and non anemic in rural area.

Parameters	Group	Number	Mean value	Std. Deviation	P value	Inference
Hb gm %	Anemic	60	9.97	0.997	0.001	HS
	Non anemic	40	12.56	0.396		
RBC millions/mm ³	Anemic	30	4.390	.3745	0.793	NS
	Non Anemic	20	4.415	.2412		
PCV %	Anemic	30	34.507	3.4495	0.001	HS
	Non Anemic	20	40.710	2.0201		

Continue

Parameters	Group	Number	Mean value	Std. Deviation	P value	Inference
MCV fl	Anemic	30	78.500	11.5021	0.001	HS
	Non Anemic	20	91.085	3.8429		
MCH pg	Anemic	30	22.667	3.5706	0.001	HS
	Non Anemic	20	28.130	1.4357		
MCHC g/dl	Anemic	30	28.840	2.4319	0.001	HS
	Non Anemic	20	31.340	2.0184		

Table 2: Comparison of Hematological Parameters in Adult females of age group (18 - 35 years) between anemic & non - anemic in urban area.

Parameters	Group	Number	Mean	Std. Deviation	P Value	Inference
Hb gm %	Anemic	56	10.15	.532	0.001	HS
	Non Anemic	44	12.56	.645		
RBC millions/ mm ³	Anemic	28	7.379	10.6352	0.185	NS
	Non Anemic	22	4.318	.3002		
PCV %	Anemic	28	35.696	3.0789	0.001	HS
	Non Anemic	22	38.932	2.4396		
MCV fl	Anemic	28	79.568	12.2190	0.001	HS
	Non Anemic	22	89.609	3.7369		
MCH pg	Anemic	28	22.529	3.3554	0.001	HS
	Non Anemic	22	28.882	1.6112		
MCHC g/dl	Anemic	28	28.971	2.3442	0.001	HS
	Non Anemic	22	32.505	1.8123		

Table-3 Comparison of haematological parameters in rural and Urban females (Anova Test)

Rural	P- Value	Inference	Urban	P- Value	Inference
Hb gm %	0.001	P<0.005 (HS)	Hb gm %	0.001	P<0.005 (HS)
RBC millions/ mm ³	0.004	P<0.005 (HS)	RBC millions/ mm ³	0.027	P<0.005 (NS)
PCV %	0.001	P<0.005 (HS)	PCV %	0.001	P<0.005 (HS)
MCV fl	0.001	P<0.005 (HS)	MCV fl	0.001	P<0.005 (HS)
MCH pg	0.001	P<0.005 (HS)	MCH pg	0.001	P<0.005 (HS)
MCHC g/dl	0.001	P<0.005 (HS)	MCHC g/dl	0.001	P<0.005 (HS)

HS: Highly Significant, NS : Insignificant

Table-4: Percentage distribution of Anemia among adult female subjects in rural and urban areas

Rural (n=100)	Urban (n=100)	Total samples (n=200)
Anemia 60%	Anemia 56%	Anemia 58%
Anemia types (%)	-	-
Microcytic anemia (70%)	Microcytic anemia (67.8%)	Microcytic anemia (40%)
Macrocytic anemia (13.5%)	Macrocytic anemia (17.8%)	Macrocytic anemia (9%)
Normocytic anemia (16.6%)	Normocytic anemia (14.2%)	Normocytic anemia (9%)
Non- anemic (40%)	Non- anemic (44%)	Non- anemic (42%)

Discussion

The study aimed at detection of anemia and types in this group. The areas selected are rural and urban areas of Patancheru (Mandal) Telangana. In the present study Hb, RBC,PCV,parameters taken into determine anemia blood indices MCV, MCH,MCHC were used to classify anaemia. The type of anemia occurring in rural and urban females categorized by these blood indices. The blood indices include mean corpuscular volume (MCV), mean corpuscular haemoglobin (MCH), and mean corpuscular haemoglobin concentration (MCHC).

It is reported rural women has a higher prevalence of anemia compare to urban women.⁸ it was suggested that, effects on iron deficiency anemia are, PEM (19%), bleeding from alimentary track(56 %), high bleeding during menstruation (29%), pregnancy(6%).⁹ it is suggested that B 12 deficiency observed in vegetarian families and infants of breast feeding, as Vegetarian mothers cobalamin content of milk is low¹⁰. Macrocytic anemias seen in elderly women; ageing process may be the intrinsic factor in development of this type of anemias. our results suggested over all prevalence of anemia (Hb < 12 g / dl) is 58%. In rural females 60 %. In urban females 56 %. In urban females anemia is mild type (11.9 – 10 g/dl), In rural females mild to moderate type anemia observed. overallly the commonest type is microcytic anemia where MCv (<78 fl) is 40% and macrocytic anemia (MCV > 96 fl) are 9% and normocytic anemia (MCV 78 -96 fl) 9%. The mean age group is 25.7years. our study results observed that mean Hb value falls than normal in both rural and urban females. Mean Hb of rural females is 11 g/dl, mean Hb of urban female is 11.2 g/dl, results suggested that anemia prevails both in rural and urban females. Mild type

of anaemia observed in urban females, mild to moderate anaemia observed in rural females. The RBC indices MCV, MCH, MCHC, p -values (P<0.005) significantly correlates with microcytic, macrocytic and normocytic anemias. In present study anemia occurrence is slightly higher in rural females compared to urban females in rural females most common type are microcytic, followed by normocytic and macrocytic anemias. In urban^{11 12} females microcytic anemias followed by macrocytic and normocytic anemias. Rural females usually suffer with chronic infections and inflammatory diseases, so these tests may not correlate significantly with anemias and also expensive and unavailable to rural females.¹³ Thus a brief dietary history, family history, local examination with blood indices study helps the clinician greatly in differentiating and diagnostic aspects of anemias. As per the national guidelines antenatal programs included, however there is a still a need to reinforce this key element and give sufficient importance to it as an intervention for reducing maternal morbidity and mortality.¹⁴ The present study warrant a need for attention to anemia among this age group.

Conclusion

The present study results indicate the prevalence of anemia is slightly higher among rural adult females compared to urban females considering it to be major health problem in the adult females of both rural as well as urban areas of developing countries like India. The results shows that iron urban females mild type of anemia is common, while in rural mild to moderate type. The current study results suggests need of due emphasises on iron and folic acid supplementation and health and education on the consumption of iron rich foods, so as to bring down the prevalence of anemia among the adult women. prevention of

anemia in adult females could improve the health status of the future mothers to avoid morbidity and mortality in both mother and foetus.

Limitation of study: Owing to remote location of study centre, small number of patients and lack of latest techniques, we have limited findings and results.

This research paper was approved by Ethical committee of TRR institute of medical sciences, Inole, Patancheru (Mandal), sangareddy (District), Telangana 502319.

No conflict of interest

No funding

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