Section: Community Medicine

Original Research Article

PREVALENCE OF NUTRITIONAL ANEMIA AMONG CHILDREN AGED 6 TO 59 MONTHS ATTENDING PAEDIATRIC OPD IN A TERTIARY CARE HOSPITAL - A CROSS SECTIONAL STUDY

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Abstract

Background: Anemia is a serious global public health problem that particularly affects young children and pregnant women. National Family Health Survey -5 (NFHS -5) data estimates the prevalence of anemia 6 months – 59 months in Tamil Nadu as 57.4 % whereas the national prevalence is 67.1%. Hence this study was conducted with the objective to determine the prevalence of anemia and other factors influencing the nutritional status of children in the age group of 6 to 59 months. **Materials and Methods:** A Cross Sectional Study done among 800 children attending Peadiatric OPD of Government Thiruvarur Medical College in the year 2022. Those children in age group of 6 to 59 months fitting the inclusion criteria and whose parents were given informed consent were included. The data was entered in MS Excel and was analyzed using SPSS. Appropriate descriptive and inferential statistics were used to analyze the data. **Result:** About 53.75% had anemia. About 87.2% of children were in age group of 1 to 5 years. About 48.8% were female children. About 9.5% of mothers were illiterate. About 42.1% were cooly workers. About 97.7% belonged to Lower SES. About 96.7% were in joint family. The average HB was 8.7mg/dl and average weight gain was 8.6kg. The mean birth weight was 2.4kg. About 99.5% had no EBF. About 94.7% had pallor, 37.2% had worms, 86.7% had anorexia, 46.5% had PICA and 26.3% had tooth grinding, 45.1% had pallor in nails and 97.2% had normal hair. The mean hemoglobin was 8.4g/dl, 97% smear showed microcytic hypochromic anemia. **Conclusion:** The study shows that the prevalence of anemia is 53.7%. Even with the implementation of various health programmes targeted against anemia, the prevalence is above 50%. Some more strategies have to be planned to combat the anemia in children.

INTRODUCTION

Anemia is defined as the decrease in the proportion of red blood cells or decrease in concentration of haemoglobin.

Normal haemoglobin levels will differs across gender and age. Children who are having the haemoglobin level of above 11gm/dl is considered normal. Men having haemoglobin above 13.5gm/dl and women having above 12gm/dl are considered normal.[1] WHO estimates that 42 % of children less than 5 years of age and 40 % of pregnant women world wide are anemic.[2] NFHS -5 Data estimates the prevalence of anemia 6 months – 59 months in Tamil Nadu as 57.4 % whereas the nation al prevalence is 67.1%.[3,4]

The Ministry of Health and Family welfare has taken various measures to improve the nutritional status of children, the most recent one being the Anemia Mukt Bharath.[4] Inspite of the agreesive measures taken by the State and Central government, the prevalence of anemia has increased from 50.7 % (NFHS 4) to 57.4 % (NFHS 5) in Tamil Nadu.

The causes of anemia vary. It is determined depending whether the anemia is hypoproliferative or hyperproliferative. Hypo proliferative anemia is further classified as microcytic anemia, normocytic anemia and macrocytic anemia. The causes of microcytic anemia are iron deficiency anemia, Anemia of Chronic disease, Thalassemia etc., The causes of normocytic anemia are renal failure, Aplastic anemia, Pure red cell aplasia and multiple

myeloma etc., The causes of macrocytic anemia are alcohol, liver disease, hypothyroid, Myelodysplastic syndromes, Drug induced, Folate and vit B12 deficiency etc.

The haemolytic anemia are further classified as extravascular and intravascular. The intravascular causes are Paraoxysmal Nocturnal Hemoglobinuria, Autoimmune Hemolytic Anemia, Microangiopathic hemolytic anemia, Transfusion reactions etc. The extravascular causes are hemoglobinopathies, Enzymopathies, Drug induced etc.[5-7]

The mechanism of anemia includes increased RBcs destruction and defective erythropoiesis.[8,9] The symptoms include weakness, lethargy, PICA, shortness of breath etc., The signs include pallor, Tachypnoea, Orthostatic hypotension, etc., The examination reveals splenomegaly, hepatomegaly etc., Lab investigations like CBC, Retic Count, Peripheral smear, Hemotalological indices like MCV, MCH, MCHC are found to be useful.[10-12]

Management of Anemia depends on the type of anemia and the underlying clinical condition. Treatment with oral or IV iron, B12, folate are choices for anemia due to nutritional deficiencies. Those with nutritional anemia have to be counselled to take foods rich in iron source like green leafy vegetables, dates, foods fortified with vit B12 and folate, etc., Anemia if not treated leads to complications like multiorgan failure, arrhythmias, developmental delay etc.[1]

Hence this study was conducted with the objective to determine the prevalence of anemia and other factors influencing the nutritional status of children.

Objectives

To estimate the prevalence of nutritional anemia among children aged 6 months – 59 months attending Paediatric OPD in a tertiary care hospital.

MATERIALS AND METHODS

Study Design: Cross Sectional Study.
Study Duration: 2022
Sampling Method: Simple Random Sampling
Study Area: Peadiatric Outpatient Department of Government Thiruvarur Medical College and Hospital (GTMCH)
Sample size: The National Family Health Survey-5 (2019-2021) has estimated the prevalence of any anemia in India as 67.1%[4]

$n = 3.84pq/d^2$

n= (3.84x67.1x32.9)/3.32

n= 778

Rounding off to 800

Inclusion Criteria

Children in the age group of 6 month to 59 months and parents who have given informed consent

Exclusion Criteria

- Children with
- Developmental delay
- Inborn error of metabolism
- Hemolytic anemia
- Chronic illness

Study Stool

Semi structured pretested questionnaire – Interview method.

Part 1: Includes the information on socio-demographic profile

Part 2: Details pertaining to AN visits and health details of mother, birth details

Part 3: Questions related to Infant and Young child feeding practices, ICDS utilization

Part 4: Includes in anthropometry and RBC indices

Data Collection

Official permission to conduct the study will be obtained from the Dean, GTMCH & IEC. Informed consent will be obtained from the participants before the interview.

Analysis

The data was entered in MS Excel and was analyzed using SPSS. Appropriate descriptive and inferential statistics were used to analyze the data.

RESULTS

The study was conducted among 800 children and their mothers. The data was entered in MS Excel and analysed using SPSS statistics.

Among the 800 children, 430 children were anemic and the prevalence was found to be 53.75%. The details of 430 children are discussed below.

About 87.2% of children were in age group of 1 to 5 years. About 51.2% were male children and 48.8% were female children. [Table 1]

[Table 2] depicts the mother details. The mean age of mothers was 27 years. About 52.1% had completed school education, followed by primary and middle school. About 9.5% were illiterate. About 55.6% were housewife and 42.1% were cooly workers. About 97.7% belonged to Lower SES. About 96.7% were in joint family. The average HB was 8.7mg/dl and average weight gain was 8.6kg.

[Table 3] depicts the child details. The mean birth weight was 2.4kg. About 51.9% were first child and 43.5% were second child. 99.5% had no EBF. About 98.6% had complementary feeding that too home based foods and 1.4% had formula feeding. 99.5% of the complementary foods initiated were non nutritiouz had nuts, 85.8% had cow milk. All had mixed diet. About 80.5% registered in ICDS but only 6.5% had attended. 15.8% had Vitamin A, 1.9% had Iron and 3.75 had deworming. 100% had UIP and 99.3% had tea.

[Table 4] depicts the examination of findings. About 94.7% had pallor, 3.3% had less activity, 37.2% had worms, 86.7% had anorexia, 46.5% had PICA and 26.3% had tooth grinding, 45.1% had pallor in nails and 97.2% had normal hair.

[Table 5] depicts the anthropometry details. The mean weight is 10.7kg, height is 85.6cm, Head circumference is 47.9cm and MUAC is 14.3cm.

The [Table 6] depicts the investigation details. The mean hemoglobin was 8.4mg/dl, mean PCV was

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26.3%, mean RBC is 4.2million, mean MCV is 64.8 fl, mean meinzter index was 15.4, mean MCH was 31.3 pg, Mean RDW is 16.4, Mean platelet is 4.2. 97% smear showed microcytic hypochromic anemia. 93.7% had normal USG. All had no occult blood in stool and 34.9% had stool ova cyst.

Table 1: Demographic details

Age	**N**	**%**
<1 year	55	12.8%
1 to 5 years	375	87.2%
Gender	N	%
Male	220	51.2%
Female	210	48.8%

Table 2: Mother details

Variable	**Mean**	**SD**
Mother age	27 years	4 years
Mother education	N	%
Illiterate	41	9.5%
Primary and Middle school	147	34.2%
High and Higher secondary	224	52.1%
Graduate	18	4.2%
Mother Occupation	N	%
Cooly	181	42.1%
Housewife	238	55.6%
Teacher	10	2.3%
SES	N	%
Lower	420	97.7%
Middle	10	2.3%
Family type	N	%
Joint	416	96.7%
Nuclear	14	3.3%
Variable	Mean	SD
Mother Hb (g/dl)	8.7	1
AN weight gain (kg)	8.6	0.8

Table 3: Children details

Variable	**Mean**	**SD**
Birth weight	2.4kg	0.3kg
Birth order	N	%
1	223	51.9%
2	187	43.5%
3	20	4.7%
EBF	N	%
Yes	2	0.5%
No	428	99.5%
Feeding	N	%
Formula feed	6	1.4%
Complementary feed – Home Based foods	424	98.6%
Feeding	N	%
Non nutritious Complementary foods	428	99.5%
Cow milk - Yes	369	85.8%
Mixed diet	430	100%
ICDS registered	346	80.5%
ICDS attendance	28	6.5%
Vitamin A	68	15.8%
Iron	8	1.9%
Deworming	16	3.7%
UIP	430	100%
TEA	427	99.3%

Table 4: Examination details

Variable	**N**	**%**
Pallor	407	94.7%
Poor attention span	9	2.1%
Activity	14	3.3%
Worms	160	37.2%
Anorexia	373	86.7%
PICA	200	46.5%
Tooth grinding	113	26.3%
Nail – Palor	194	45.1%
Hair hypopigmented	6	1.4%

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Hair sparse	6	1.4%

Table 5: Anthropometry details

Variable	Mean	SD
Weight	10.7kg	3.4kg
Height	85.6cm	12.9cm
Head circumference	47.9cm	3.7cm
Mid Upper Arm Circumference	14.3cm	2.3cm

Table 6: Investigation details

Variable	Mean	SD
Haemoglobin (g/dl)	8.4	1.5
PCV(%)	26.3	4.1
RBC	4.2	0.47
MCV (fl)	64.8	4.9
Meinzter index	15.4	1.2
MCH (pg)	31.3	1.09
RDW	16.4	1.4
Platelet (lakhs/cumm)	4.2	1.09
Variable	N	%
Microcytic HypochromicAnemia	417	97%
Normocytic normochromic anemia	13	3%
USG Abdomen – Normal	403	93.7%
USG – Spleen	27	6.3%
Stool Ova – Yes	150	34.9%

DISCUSSION

Among the 800 children, 430 children are anemic and the prevalence is found to be 53.75%. The results are comparable to NFHS 5 results which is 57%. Our results comparatively similar to NFHS 5 survey. About 87.2% of children are in age group of 1 to 5 years. About 51.2% are male children and 48.8% are female children. The findings are similar to study done by Dutta M et al.[13]

The mean age of mothers is 27 years. About 52.1% had high and higher secondary school education, followed by primary and middle school. About 9.5% are illiterate. About 55.6% are housewife and 42.1% are cooly workers. About 97.7% are in Lower SES. About 96.7% are living in joint family. The study shows that anemia is prevalent in low SES and those living in joint family. The findings are comparable to study done by Meenakshi et al.[14]

The average Hb of mothers is 8.7mg/dl and Average weight gain is 8.6kg. The study results showed that the maternal Hb and weight gain had effect on child haemoglobin level. The study findings are similar to study done by Ayoya et al.[15]

The mean birth weight is 2.4kg. About 51.9% are first child and 43.5% are second child. 99.5% are born of singleton pregnancy. 87.7% are born at term. About 99.5% had no EBF. About 98.6% had complementary feeding that too home based foods and 1.4% had formula feeding. 99.5% had nuts, 85.8% had cow milk. All are having mixed diet. About 80.5% registered in ICDS but only 6.5% are attending. 15.8% had Vitamin A, 1.9% had Iron and 3.75 had deworming. 100% had UIP and 99.3% had TEA.

About 94.7% had pallor, 3.3% had less activity, 37.2% had worms, 86.7% had anorexia, 46.5% had PICA and 26.3% had tooth grinding, 45.1% had pallor in nails and 97.2% had normal hair. The above said features are suggestive of anemia.[1] The mean weight is 10.7kg, height is 85.6cm, Head circumference is 47.9cm and MUAC is 14.3cm. The study findings are comparable to study done by George et al.[16]

The mean hemoglobin is 8.4mg/dl, mean PCV is 26.3, mean RBC is 4.2, mean MCV is 64.8, mean MIND is 15.4, mean MCH is 31.3, Mean RDW is 16.4, Mean platelet is 4.2. 97% smear shows microcytic hypochromic anemia. 93.7% had normal USG. All had no occult blood in stool and 34.9% has stool ova cyst. The investigations are highly suggestive of anemia. The findings are comparable to study done by Behera et al.[17]

CONCLUSION

The study shows that the prevalence of anemia is 53.7%. Still, after many health programmes launched, the prevalence is above 50%. Some more strategies have to be planned to combat the anemia in children.

Recommendations

1. ICDS utilisation to be improved
2. Strategies to improve the haemoglobin levels in children to be devised and employed.

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