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Research Paper

A Study of Anemia in Pediatric Patients in A Tertiary Care Hospital at Rajkot (Gujarat), India: A Study Over A Period of one Year

Medical Science

KEYWORDS : Anemia, females, hypochromic microcytic

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ABSTRACT

This data was procured from blood samples of indoored pediatric patients received and analysed in Central Clinical Laboratory, Department of Pathology, PDU Medical College & Hospital, Rajkot.Collected blood samples were sent in EDTA (Ehylene Diamine Tetraacetic Acid) vacutte were tested on automated cell counter along with peripheral blood smear examination was done which concluded that anemia was more prevalent in age group 1 to 2 years among children and the most common morphologic type was hypochromic microcytic anemia and females were more commonly affected than males .

INTRODUCTION:

Anemia is defined as reduction in the oxygen carrying capacity of blood, as observed by reduced levels of hemoglobin concentration and red cell mass (Hematocrit) leading to tissue hypoxia.Anaemia in childhood is defined as a haemoglobin (Hb) concentration below established cut-off levels. These levels vary depending on the age of the child, and on the laboratory in which the blood sample is tested. Reference ranges for specific laboratories and age groups should always be referred to. The World Health Organization (WHO) has suggested levels of Hb below which anaemia is said to be present. These levels are <11 g/dL in children aged 6-59 months and <11.5 g/dL in children aged 5-11 years and 12 g/dl in older children (aged 12-14).Anemia is caused by either poor production of red blood cells, destruction of red blood cells, or loss of red blood cells.

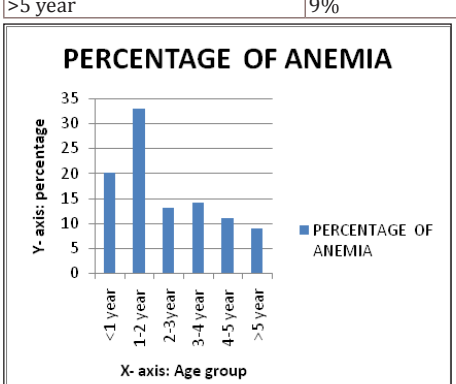
MATERIAL & METHODS: The study was conducted in Central Clinical Laboratory , Department of Pathology, PDU Medical College & Hospital, Rajkot. The studied blood samples consisted of patients admitted and investigated at PDU Hospital between 0 to 12 years age group between January to December 2013 time period and patients having Hb <11.0 gm/dl were evaluated. The blood collected in EDTA vacutte was sent to laboratory and reporting was done based on readings from automated cell counter SYSMEX KX 21as well as by peripheral blood smear examination by Romanowsky staining method.

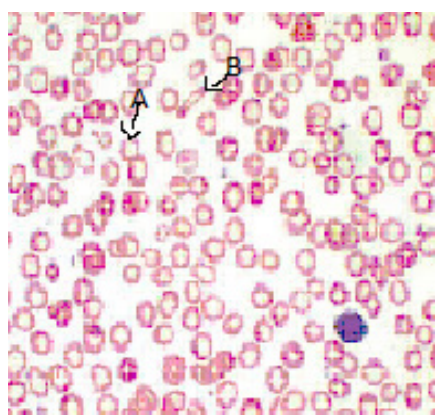
RESULTS:

Total number of pediatric samples were 8400 (100%) out of which 5712 (67.8%) were having anemia.

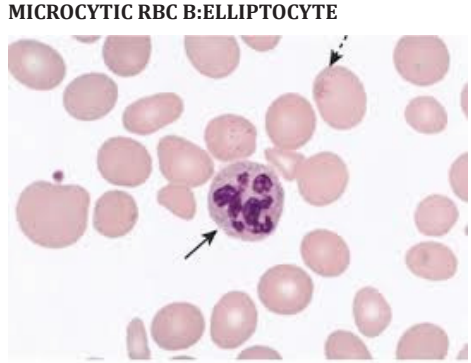
TABLE 1. CASE DISTRIBUTION ACORDING TO THE AGE GROUP:

Age group	Percentage of anemia(100%)
<1 year	20%
1-2 year	33%
2-3year	13%
3-4 year	14%
4-5 year	11%
>5 year	9%

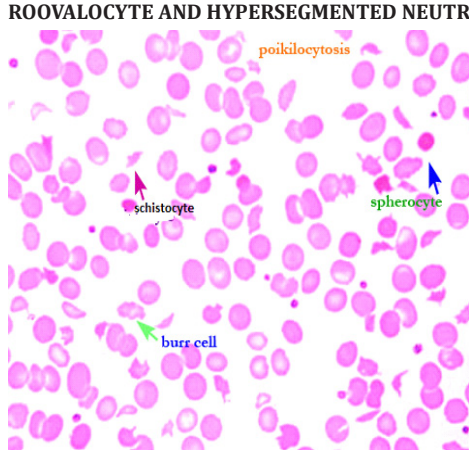




1 .HYPOCHROMIC MICROCYTIC ANEMIA A:HYPOCHROMIC MICROCYTIC RBC B:ELLIPTOCYTE



2 .MACROOVALOCYTIC ANEMIA :ARROW SHOWS MACROOVALOCYTE AND HYPERSEGMENTED NEUTROPHIL



3. HEMOLYTIC ANEMIA

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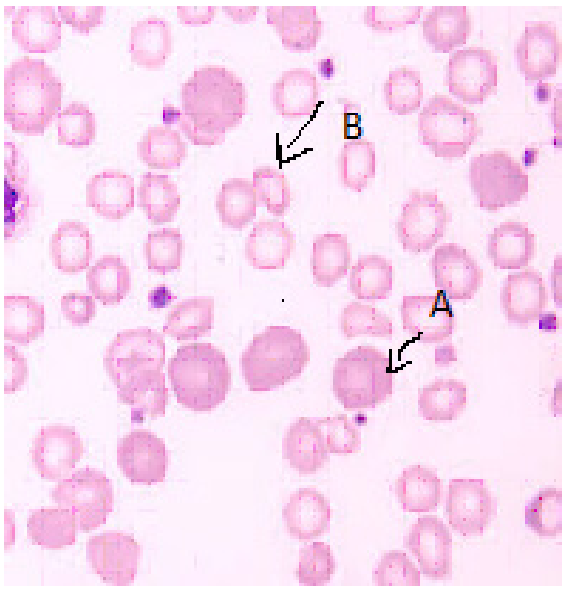

4.DIMORPHIC ANEMIA : A :MACROCYTIC RBC B: HYPOCHROMIC MICROCYTIC RBC

TABLE 2 : DISTRIBUTION ACCORDING TO AGE GROUP AND MORPHOLOGIC TYPES:

Anemia Type	Percentage
Hypochromic microcytic	3484(61%)
Dimorphic	1142 (20%)
Macro-ovalocytic	856 (15%)
Hemolytic	228(4%)

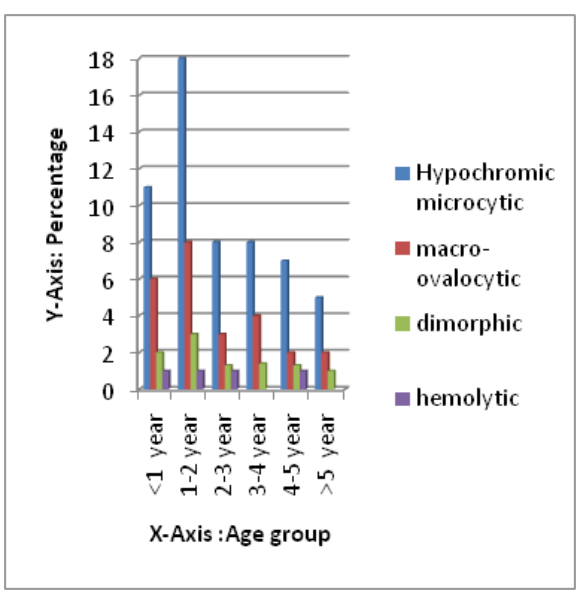

TABLE 3:DISTRIBUTION ACCORDING TO MORPHOLOGIC TYPES:

Anemia Type	Percentage
Hypochromic microcytic	3484(61%)
Dimorphic	1142 (20%)
Macro-ovalocytic	856 (15%)
Hemolytic	228(4%)

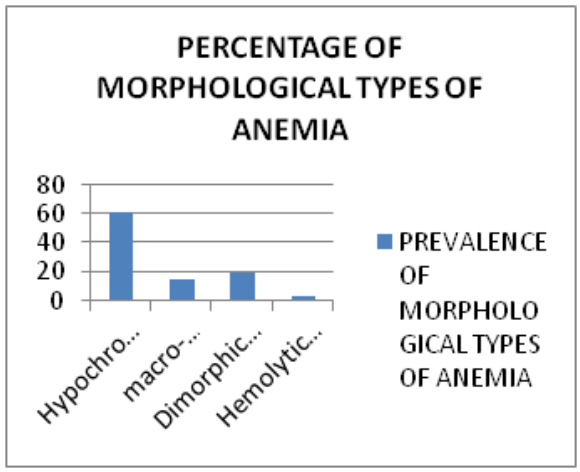

TABLE 4:SEX WISE DISTRIBUTION OF ANEMIA:

MORPHOLOGICAL TYPE OF ANEMIA	MALE(%)	FEMALE(%)
HYPOCHROMIC MICROCYTIC	26%	35%
MACROOVALOCYTIC	9%	6%
DIMORPHIC	11%	9%
HEMOLYTIC	2%	2%

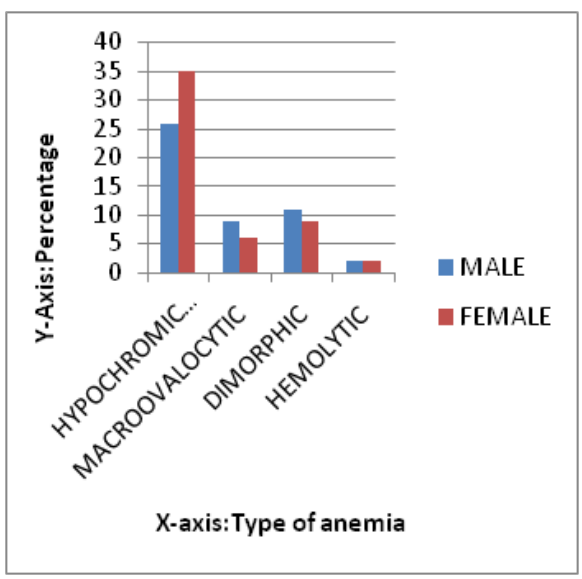

TABLE 5:GLOBAL DISTRIBUTION OF ANEMIA IN STUDY OF WHO DURING THE PERIOD OF 1993 TO 2005:

GLOBAL DISTRIBUTION	AGE WISE PREVALENCE OF ANEMIA	
	0 TO 5 YEARS	5 TO 15 YEARS
AFRICA	74.60%	13.20%
AMERICA	76.70%	47.10%
SOUTH EAST ASIA	85.10%	13.60%
EUROPE	26.50%	9.30%
EASTERN MEDITERRENIAN	67.40%	15.50%
WESTERN PACIFIC	90.40%	83.10%
OUR STUDY (RAJKOT-GUJARAT)	91.00%	9.00%

TABLE 6:DISTRIBUTION OF ANEMIA IN VARIOUS STATES OF INDIA:

STATE	PREVALENCE OF ANEMIA
TAMILNADU	52.88%
KARNATAKA	75%
GUJARAT(AHMEDABAD)	81.20%
OUR STUDY(RAJKOT-GUJARAT)	67.8%

DISCUSSION:

Prevalence of anemia in our study was 67.8% which is in accordance with study conducted by Venkatesh G [1] at Ahmedabad in which prevalence was 81.2% respectively, Shally Awasthi et al [2] found prevalene of 37to 38 % in studies done in Uttar Pradesh,Bijan Keikhaei [3] found prevalence of 43.9% among children of South West Iran,Peter R Dallman[4] found prevalence of 6%in United States of America.Our findings are also in accordance with the study of WHO during the time period of 1993 to 2005 in various countries of world.Prevalence of anemia according to different age group in our study show prevalene of anemia is highest in the age group between 1 to 2 years which is 33% and it is highest as compared to other age groups in accordance with studies of Shally Avasthi et al [2] and Bijan keikhaei [3]. The most common reason behind this is continued breast feeding beyond 6 month and improper complimentary feeding which leads to deficiency of iron because breast milk is deficient in iron.Improper complimentary feeding techniques leads to various types of infection and malnutrition. Hypochromic microcytic anemia is the most common type of anemia followed by dimorphic , macroovalocytic , and hemolytic which is in accordance with previous studies like Shally Awasthi[2] and Venkatesh G [1] . Iron deficiency anemia is the most common cause for hypochromic microcytic anemia.Sex wise distribution of anemia shows that hypochromic microcytic anemia is more prevalent in female whereas there is no such sex wise difference seen in case of macroovalcytic and dimorphic anemia as well as hemolytic anemia which is in accordance with studies of Neeraj Jain et al [5].

Conclusion:

From our study which includes pediatric patient from 0 to 12 years age group and both the sexes; we came to know that anemia is more prevalent in the age group of 1 to 2 years and most common morphological types are hypochromic microcytic anemia followed by dimorphic anemia respectively.The most common reason behind both morphological types is nutritional deficiency most common of iron , vitamin B12 and folic acid.

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