

## Prevalence of Anemia in Egypt (Al-Gharbia Governorate)

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### Abstract

**Introduction:** Iron deficiency anemia is the most common type of anemia related to malnutrition world wide. It represents a major problem in developing countries, especially in Egypt.

**Purpose:** The present study was designed to assess the prevalence and status of anemia in Al-Gharbia Governorate in Egypt.

**Material and Methods:** 649 mothers and one of their sibling were chosen from different districts with different food habits and socio-economic status. Hb were determined in mothers and sibling. Anthropometric measurement includes measurements of height and weight was done. Age was recorded. Education, Job, income; marital status and number of personal/family are recorded when possible.

**Results:** No severe anemia (Hb < 7g/dl) was found in any studied group (mothers or sibling), only moderate to mild anemia was found ((Hb > 7g/dl). The prevalence of anemia in mother's is > 47 %, which represent a problem of high degree, while, the prevalence of anemia in sibling is 52.25 & 54.03 % for male and female respectively which represent a problem of high degree. The cause of anemia in mothers may be due to menstrual blood loss, increased duration of menstrual blood flow, while in children may be due to anemic mother, poor, diet, bad food habit.

**Conclusion:** To reduce prevalence of anemia and improve anemic mothers, sibling status in Egypt we need to improve iron supplementation program

**Key Words:** Egypt, Anemia, Women,

### Introduction

The World Bank estimates that one-half of the world's population suffers from malnutrition and that two million people suffer from diseases related to iron, iodine and vitamin A deficiency (World Bank 1996). These deficiencies affect women, infants and children especially those of developing countries. Poor eating habits play a major role in the development of iron deficiency anemia that is an important indicator of poor health status. Children and adolescent are at increased risk of developing iron deficiency anemia because of their increased demand for iron during growth and puppy. In most cases, they are undiagnosed because of irregular, far visiting of health clinics, doctors, and hospitals (World Bank 1996).

Iron-deficiency anemia (IDA) in infants is a common problem worldwide and an enormous public health risk in developing countries. The prevalence of anemia in infants varies between 5% and 43% according to the population studied and the

cut-off hemoglobin level used to define anemia in infancy (Florentino & Guirric 1984; deMeyer & Adiels-Tegman 1985; UNAC<sup>1</sup> 1987; and Stoltzfus 2001 a & b).

In developing countries, 40–45% of children aged 0–4 y old suffer from anemia (ACC/SCN 2000). The main cause of anemia is iron deficiency (ACC/SCN 2000). Severe anemia increases mortality; iron deficiency impairs behavioral and cognitive development and reduces fitness and work capacity (Stoltzfus 2001 a & b).

Anemia is caused either by limited dietary intake, excessive loss of nutrients or excessive utilization. The anemia is associated with a number of sequelae including both structural changes, like mitochondrial swelling and mucosal atrophy, and functional abnormalities, such as cardiac failure, decreased work output,

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<sup>1</sup> UNAC: United Nations Administrative Committee.

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increased pregnancy risks and increased susceptibility to infections

Globally, iron deficiency anemia ranks number 9 among 26 risk factors included in the Global Burden of Disease (GBD) 2000, and accounts for 841,000 deaths and 35,057,000 disability-adjusted life years lost. Africa and parts of Asia bear 71% of the global mortality burden and 65% of the disability-adjusted life years lost (WHO 2001, Stoltzfus 2003).

With 40% prevalence of anemia in the world, the prevalence in the developing countries tends to be three to four times higher than in the developed countries (Karkar and Kotecha 2004).

### Aim Of The Work

The present study was designed to assess the prevalence and status of anemia in Al-Gharbia Governorate in Egypt.

### Material And Methods

#### Subjects

The study was conducted in Al-Gharbia Governorate in Egypt during years 2003-2005. It includes 649 families of different ages, socioeconomic status with different food habits. The families included in the study were from different sites in the Governorate.

A social demographic profile including mothers' education, income of the family, age of both mother and one of her sibling, gender of the sibling, family structure and no of personal/family. General status of mothers and sibling were recorded.

#### Biochemical Analysis

Samples were collected for estimation of hemoglobin (Hb) by cyanmethemoglobin method (Van Kampen and Zijlstra 1961).

#### Anthropometric Data

Anthropometric measurement includes measurements of height and weight according to standard WHO procedures (WHO Working Group, 1986) were done.

Weight was measured to the nearest 0.1 kg on a battery-powered digital balance and heights to the nearest 0.1 cm using a wooden length-measuring board with a

sliding head bar (WHO Working Group, 1986) for individual > 2 years. For children <2 years a specific wooden length-measuring board and specific balance is used. The body mass index (BMI) was calculated as weight/height<sup>2</sup> (kg/m<sup>2</sup>) and thinness defined as BMI for- age below the fifth percentile of the NHANES I reference population (WHO Expert Committee on Physical Status, 1995) or Z-scores below -2 SD. Height for age Z-scores was calculated using the sex specific 1978 CDC/WHO normalized version of the 1977 NCHS reference data in Epi Info2000 (Centers for Disease Control and Prevention, Atlanta, US). Stunting was defined as height-for-age Z-scores below -2 SD (WHO Expert Committee on Physical Status, 1995).

Age was recorded from the reported date of birth in school records, birthday certificate, where possible.

#### Statistical Analysis

Data are expressed as Mean ±SE. Data were assessed by t-test (Avram 1964; and Steel & Torrie 1969). Analysis was performed using Epi Info 2000 and SPSS 13. The correlations coefficients were assessed by Pearson's simple linear regression analysis (Avram 1964; and Steel & Torrie 1969). P-values < 0.05 were considered statistically significant.

#### Criteria for Detecting Anemia

The criteria for detecting anemia were diagnosed as WHO guidelines, (values less than 12 g/dL for girls from 12 to 18 years and boys less than 14 years and less than 13 g/dL for boys from 15 to 18 yrs of age, WHO/UNICEF/UNU 1996, 2001). Cut-off values have been established for groups of different ages and sex, starting from the age of 6 months (CDC 1998 criteria, WHO/UNICEF/UNU<sup>2</sup> 1997). The cut-off value for children aged 6 months to 5 y is 11 g/dl (Table 1).

#### Degree of Anemia

Mild anemia is diagnosed when Hb concentration is above 10.0g/dl but below the cut-off level, moderate anemia when the concentration between 7 and < 10.0 g/dl and severe anemia when it is below 7 g/dl.

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<sup>2</sup> UNU: United Nations University

On a population level, anemia prevalence can be distinguished as low, medium or high according to the level of prevalence suggested by WHO 1996 (Table 2).

## Results

The present study was conducted to investigate the prevalence of anemia on Al-Gharbia Governorate in Egypt. The study includes 649 family representing 649 women. Of the 649 mothers enrolled in the study, 27 (28.5%) refused to do Hb determination, of the 622 siblings enrolled in the study, 189 (30.39%) refused to do Hb determination. 27 (4.16 %) of the mothers didn't allow their children to be measured or analyze Hb. The mean age of the mothers in the total sample is  $32.10 \pm 0.27$  with a range: 17 -  $\leq$  60 y, while the mean age of the male sibling in the total sample is  $6.93 \pm 0.30$  y, and for female sibling is  $7.27 \pm 0.34$  y with a range: 0.5 - 30 y. Number of male sibling participating in the study is higher the female one (M: F, 355: 267, 57.1: 42.9 %).

Table (3) shows distribution of mothers according to age, income, job, marital status and number of personal/family. The income of around 75% of the family is  $\leq$  200.0 LE. 85.7 % of the mothers are jobless. 94.9 % of the mothers are married. Most of the families are big where number of personal/family ranges 2 - 9 persons with an average of 5.

Table (4) shows prevalence (%) of anemia in the studied mothers in different physiological status. A significant increase was found between Hb of non-pregnant lactating (NP L) and pregnant lactating (P L) and also between non-pregnant non-lactating (NP NL) and pregnant non-lactating (P NL) of the non-anæmic mothers. Also a significant increase was found between Hb of non-pregnant lactating (NP L) and non-pregnant non-lactating (NP NL) of the mothers. Prevalence (%) of anemia in the P L, NP L and NP NL of studied mothers is  $\geq$  47% which represent a high problem according to table 2, while prevalence of anemia in the whole anemic sample (200 mother) is 45.26 % which represent a high problem.

Table (5) shows prevalence (%) of anemia among mothers in different physiol-

ogical states according to age group. Prevalence (%) of anemia among mothers  $\leq$  20 y is 37.04 % which represent a medium problem while prevalence (%) of anemia among mothers  $\geq$  20 -  $\leq$  60 y is  $>$  43.0 % which represent a high problem. Table (5) also shows that 56.4% of the mothers are illiterate, 91.4% are not pregnant, and 80.6 % are non-lactating.

Table (6) shows distribution of the sibling according to sex, age, weight, height, BMI and Hb. The number of male sibling participating in this study is higher than female sibling (32.96 %). No significant differences were found between age, weight and height of male and its respective female sibling (according to age group).

Table (7) shows prevalence of anemia in the studied sibling according to age group. The prevalence of anemia in preschool children (6-60 months) is 49.48 & 56.12 % for male and female respectively where female shows higher prevalence. In general, the prevalence of anemia in this study is 52.25 & 54.03 % for male and female respectively where female shows slightly higher prevalence rate. The high prevalence of anemia in male adolescent was noticed at age group 13-14 y where it reach 83.33 % while the high prevalence of anemia in female sibling was noticed at age group  $\geq$  19 y where it reach 100 %.

No significant correlation was found between anemic mothers and their children or between anemic children and their mothers, which disagree with Joseph *et al.* (2006).

In this study no severe anemia (Hb  $<$  7g/dl) was found in any studied group (mothers or sibling), only moderate to mild anemia was found ((Hb  $>$  7g/dl).

Table (8) shows Z-Score of height/age; weight/age; weight/height of the studied sibling. HAZ shows that  $\geq$  53 % of the sibling (male & female) are within normal range while  $\geq$  10.2 % are tall and  $\geq$  30.4 % are stunted. WAZ shows that  $\geq$  75.2 % of the sibling (male & female) are within normal range while  $\geq$  4 % are over weight and  $\geq$  15.2 % are underweight. WHZ shows that  $\geq$  77.1 % of the sibling (male & female) are within normal range while  $\geq$  11.6 % over weight and  $\geq$  7.7 % are wasting.

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**Table (1): The cut-off value for anemia**

	Children			Girls	Boys	Boys	Non pregnant	Pregnant
Age	6-60 month	5-11y	12-13 y	<12-18 y	<14 y	15-18 y		
Hb (g/dl)	11.0	11.5	12.0	12.0	12.0	13.0	12.0	11.0

**Table (2): Prevalence of anemia on a population level.**

Level	Low	Medium	High
% Prevalence	< 15 %	15-40 %	> 40 %

**Table (3): Distribution of mothers according to age, income, job, marital status and number of personal/family.**

	Age	No	Age (y)		Income (LE)					Job		Marital Status			No of Person/house																					
			M ±SE	M ±SE	≤100	≤200	≤300	≤400	≤500	1	2	1	2	3	M ±SE	2	3	4	5	6	7	8	9													
1	≤20 Y	31	18.82±0.12	190.16±16.28	3.2	71.0	12.9	12.9		6.5	90.3	93.5			4.74±0.23		16.1	35.5	19.4	16.1	12.9	3.2														
2	≤30 Y	249	26.65±0.17	181.65±3.25	4.4	77.1	17.7	0.4	0.4	10.0	88.4	94.4	1.2	0.4	4.75±0.08	0.4	14.0	31.7	28.1	16.9	3.6	4.0	0.4													
3	≤40 Y	307	35.24±0.15	180.36±3.04	4.2	78.2	16.3	1.0	0.3	12.1	85.7	95.4	3.9		4.89±0.08	0.3	14.3	28.7	27.0	15.3	11.4	2.3	0.7													
4	≤50 Y	52	43.56±0.22	200.67±13.29	7.69	57.6 9	28.8 5	1.92	3.85	7	41	49			5.10±0.18		7.69	21.15	22	42.3 1	3.85	3.85	1.92													
5	≤60 Y	10	52.60±0.45	195.40±16.32		70.0	30.0			50.0	40.0	100			4.70±0.21			40.0	50.0	10.0																
	Total	649	32.10±0.27	183.18±2.36	4.5	75.7	17.9	1.9	0.6	11.7	85.7	94.9	0.8	0.2	4.84±0.05	0.3	13.9	29.7	28.7	16.2	7.7	2.9	0.6													

Job: 1: Working, 2: not working; Marital Status: 1: Married, 2: Widow, 3: Divorced

**Table (4): Prevalence (%) of anemia in the studied mothers in different physiological status**

		Anemia						Hb (g/dl)								
		b			c			Mild			Non Anemic			No	M±SE	
		No	No	%	M±SE	No	%	M±SE	No	%	M±SE	No	%	M±SE	No	M±SE
Pregnant	Lactating	7	2	33.33	9.93±0.43	1	16.67	10.8		3	50.0	12.03±0.37	6		10.98±0.49	
	Non Lactating	49	3	8.57	9.43±0.23	3	8.57	10.93±0.07		29	82.86	12.18±0.14	35		11.83±0.18	
Non Pregnant	Lactating	119	17	20.73	9.18±0.17	24	29.27	11.12±0.10		41	50	13.21±0.12	82		11.76±0.19	
	Non Lactating	474	25	7.33	9.46±0.07	135	39.59	11.34±0.04		181	53.08	13.11±0.06	341		12.14±0.07	
Total		649	47			163				254			464			
% Anemic										45.26						

**Table (5): prevalence of anemia among mothers in different physiological states according to age group**

Group No		No	Education					Total Sample No	Hb (g/dl)	Moderate	Mild	Anemia %	Non Anemic	Lactating		Pregnant							
			1	2	3	4	5							No	M ±SE					1	2	1	2
			1	≤20 Y	31	54.8	12.9							6.5	12.9	12.9	31	11.93±0.28	P L	66.67	-		33.33
										P NL				100									
										NP L	25	16.67		58.33									
										NP NL		37.5		62.5									
													<b>37.04</b>										
2	≤30 Y	249	54.2	14.5	5.2	20.5	4.0	249	12.01±0.08	P L		50.0		50.0	16.9	79.5	11.6	88.4					
										P NL	10.0	5.0		85.0									
										NP L	24.24	18.18		57.58									
										NP NL	5.08	44.07		50.85									
													<b>43.93</b>										
3	≤40 Y	307	58.3	10.1	5.2	18.9	5.2	307	12.12±0.08	P L				100	16.9	80.5	6.5	93.5					
										P NL	9.09	18.18		72.73									
										NP L	16.22	43.24		40.54									
										NP NL	7.6	37.43		54.97									
													<b>46.36</b>										
4	≤50 Y	52	59.61	9.62	3.85	15.38	11.54	52	11.85±0.17	NP NL	10.0	40.0		50.0		100		100					
													<b>50.0</b>										
5	≤60 Y	10	40.0	20.0		10.0	30.0	10	11.30±0.66	NP NL	50.0			50.0		100		100					
													<b>50.0</b>										
<b>Total</b>			<b>56.4</b>	<b>12.0</b>	<b>5.1</b>	<b>18.8</b>	<b>6.0</b>	<b>649</b>					<b>45.26</b>		<b>16.8</b>	<b>80.6</b>	<b>8.6</b>	<b>91.4</b>					

Education: 1: Illiterate; 2: Read and write; 3: Preparatory; 4: High school; 5: University;  
Lactating: 1: Lactating; 2: Non Lactating; Pregnant: 1: Pregnant; 2: Non Pregnant;  
P L: Pregnant Lactating; P NL: Pregnant Non Lactating; NP L: Non Pregnant Lactating;  
NP NL: Non Pregnant Non Lactating;

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**Table (6): Distribution of the sibling according to sex, age, weight, height, BMI, and Hb.**

		No	Age	Weight (kg)	Height (cm)	BMI Kg/m <sup>2</sup>	Hb sibling g/dl
<b>Male</b>							
	6-60 month	166	23.05±1.64	11.01±0.39	80.45±1.46	16.84±0.38	11.13±0.16
	5-11 years	97	8.13±0.21	23.15±0.66	121.23±1.72	15.70±0.31	11.31±0.19
	11-<13 years	20	12.03±0.04	32.57±1.74	140.43±1.08	16.52±0.84	11.47±0.43
	13-14 years	28	13.47±0.14	39.00±1.98	143.00±3.60	19.35±1.28	10.55±0.34
	15-18 years	38	15.63±0.23	49.08±3.1	154.45±3.58	20.3±0.85	12.40±0.37
	19-30 years	6	23.67±2.54	58.58±3.67	160.00±1.34	22.96±1.76	11.55±1.65
<b>Total</b>	<b>0.5: 30 y</b>	<b>355</b>	<b>6.93±0.3</b>	<b>22.87±0.80</b>	<b>109.06±1.71</b>	<b>17.42±0.22</b>	<b>11.29±0.09</b>
<b>Female</b>							
	6-60 month	125	25.60±1.60	11.79±0.38	83.36±1.46	16.90±0.28	10.99±0.19
	5-11 years	72	8.63±0.20	25.89±0.83	124.25±1.35	16.69±0.44	11.86±0.18
	12-18 years	64	14.59±0.21	45.33±1.64	144.11±2.18	22.28±1.08	11.70±0.19
	≥ 19 years	6	22.00±0.00	60.00±0.00	162.00±0.00	22.86±0.00	11.90±0.00
<b>Total</b>	<b>0.5: ≥ 19 y</b>	<b>267</b>	<b>7.27±0.34</b>	<b>24.68±0.98</b>	<b>110.69±1.84</b>	<b>18.26±0.31</b>	<b>11.42±0.10</b>

**Table (7): Prevalence of anemia in the studied children (sibling)**

Hb (g/dl)																	
		Moderate			Mild			Anemic %	Non Anemic		Total		Hb Mother g/dl	Mother Age	Income LE	No of Personal	
		No	%	M±SE	No	%	M±SE		No	%	M±SE	No					M±SE
Male	6-60 month	21	21.65	9.12±0.17	27	27.83	10.53±0.05	49.48	49	50.52	12.32±0.17	97	11.13±0.16	11.71±0.16	27.66±0.57	175.39±5.60	4.93±0.13
	5-11 years	17	21.79	8.79±0.18	22	28.21	10.96±0.09	50.0	39	50.00	12.59±0.12	78	11.31±0.19	12.27±0.14	31.19±0.43	190.43±5.25	4.65±0.13
	11-<13 years	2	14.29	8.40±0.00	6	42.86	11.27±0.24	57.14	6	42.86	12.70±0.38	14	11.47±0.43	12.22±0.47	35.10±1.01	167.00±11.77	4.70±0.40
	13-14 years	4	33.33	9.6±0.17	6	50.00	10.40±0.13	83.33	2	16.67	12.90±0.00	12	10.55±0.34	12.48±0.3	39.07±0.97	184.29±14.99	4.96±0.33
	15-18 years			-	9	52.94	11.09±0.22	52.94	8	47.06	13.88±0.11	17	12.40±0.37	12.42±0.45	39.53±0.81	181.16±12.12	4.82±0.25
	19-30 years	2	50.00	8.70±0.00			-	50.0	2	50.00	14.40±0.00	4	11.55±1.65	9.50±0.00	53.0±0.77	194.0±29.88	4.33±0.26
		46			70			106			222	11.29±0.09	12.04±0.08	31.64±0.37	180.66±2.75	4.82±0.06	
							<b>52.25</b>										
Female	6-60 month	28	28.57	9.09±0.15	27	27.55	10.48±0.05	56.12	43	43.88	12.55±0.24	98	10.99±0.19	11.77±0.11	28.84±0.55	182.84±6.62	4.81±0.14
	5-11 years	6	9.23	8.88±0.39	23	35.38	11.01±0.07	44.61	36	55.38	12.91±0.10	65	11.86±0.18	12.20±0.15	32.25±0.62	176.26±7.45	4.79±0.15
	12-18 years	2	4.35	9.70±0.00	26	56.52	10.95±0.10	60.87	18	39.13	13.01±0.19	46	11.70±0.19	12.31±0.15	38.19±0.57	174.77±8.75	5.33±0.23
	≥ 19 years				2	100	11.90±0.00	100.00			-	2	11.90±0.00	13.10±0.00	53.00±0.00	200.00±0.00	5.00±0.00
		36			78			97			211	11.42±0.10	12.04±0.07				
							<b>54.03</b>				433						

**Table (8): Z-Score of height/age; weight/age; weight/height of the studied sibling**

	HAZ			WAZ			WHZ		
	Normal	Tall	Stunted	Normal	Over weight	Under weight	Normal	Over weight	Wasting
Male	<b>53.0</b>	10.2	36.8	<b>75.2</b>	4.0	20.7	<b>77.1</b>	11.6	11.2
Female	<b>57.6</b>	12.1	30.4	<b>77.8</b>	7.0	15.2	<b>77.9</b>	14.4	7.7

## Discussion

Anemia is defined as a low hemoglobin Hb concentration. Anemia is caused either by limited dietary intake, excessive loss of nutrients or excessive utilization. The main cause of anemia is iron deficiency (ACC/SCN 2000).

The WHO estimates that most preschool children and pregnant women in developing countries and at least 30–40 % in developed countries are iron deficient anemia. The prevalence of anemia in developing countries is three to four times higher than that for developed countries. In developing countries, the most affected population groups are pregnant women (52 %)—although all women age 15–59 years are affected (42 %)—school-age children (48 %), and preschool children (39 %). Moreover, 45 % of the elderly and 30% of adult men are anemic, highlighting that the problem extends to other population groups. The problem is more extensive in Southeast Asia and sub-tropical Africa where anemia is linked to poverty.

The incidence of anemia in Egypt (as developing countries) is much higher than developed countries so the present study was aimed to investigate the prevalence of anemia in Al-Gharbia Governorate in Egypt knowing that by the year 2000 the national program of iron supplementation was implemented. The incidence of anemia in infants aged 6-60 moths ranged 49.48 – 56.12 % for male and female respectively, being higher in female which is different from developed countries as in Norway, where only 2 % to 5 % of infants were found to have IDA (Hay *et al.* 2004), while other recent reports studied the frequency of IDA in the Arab world found that 7.5% of Iranian infants aged 6 to 23 months have IDA, while in Jordan a higher frequency of anemia is reported, 72 %

(Kilbride *et al.* 1999 & 2000) which was higher than reported in this study.

A significant percentage of adolescents in the developing world are anemic, causing considerable health consequences for this age group. About 27 % of adolescents are estimated to be anemic in developing countries, compared to 6 % in developed countries (deMeyer & Adiels-Tegman 1985; and United Nations, Population Division 2000). In this study the data revealed that anemia prevalence in adolescents ranged from 44.61- 62.79 % for male and female respectively, being higher in male and this is comparable with deMeyer & Adiels-Tegman (1985); United Nations, Population Division (2000) where they suggest that prevalence rates for anemia: In Africa is 45 % for girls and 57 % for boys and also with SWACH<sup>3</sup> foundation (1997) which found an anemia prevalence rate of 82.9 % among girls in school and 92.7 % among girls not in school (illiterate) in India. On the other hand deMeyer & Adiels-Tegman (1985); and United Nations, Population Division (2000) found that prevalence of anemia in other countries as Oceania is 45 % for girls and 43 % for boys; in Latin America and the Caribbean is 12% for girls and 22 % for boys; In Asia is 19 % for girls and 17 % for boys.

In Egypt we found a high rate of anemia. In studies conducted by the International Center for Research on Women, country findings on adolescent anemia among both males and females (Kurz and Johnson-Welch, 1994) where they found high rates of anemia in Nepal (42 %), India (55 %), and Cameroon (32 %); and they found moderate rates in other

<sup>3</sup> **SWACH Foundation:** Survival for Women and Children Foundation

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countries as in Ecuador (17 %) and Jamaica (16 %).

El-Zanaty and Way, (2001) during EDHS<sup>4</sup> revealed that the overall prevalence rate of anemia among women in the reproductive age 15-49 y was 29.2 % in Egypt. The result of the present study revealed that the overall prevalence of anemia among mothers is 45.26, which is higher, and also high prevalence rate was recorded among pregnant lactating, non-pregnant lactating, non-pregnant non-lactating mothers ( $\geq 47$  %) and the least was among pregnant non-lactating (17.14 %). On the other hand deMeyer & Adiels-Tegman (1985) stated that 47 % of women of reproductive age in developing countries are anemic and during pregnancy, 59 % are estimated to be anemic.

The higher prevalence of anemia among the non-pregnant women in this study may be because lactating mother finishing her pregnancy with depleted iron stores, become exposed to the burden of lactation, which is nutritionally demanding. During the lactation period the absence of menstrual blood loss is partially offset by the secretion of 0.3 mg iron/day in breast milk in addition to the basal losses (WHO, 1995 b).

An important finding in the present study is that no severe anemia ( $Hb < 7$  g/dl) was found either among mothers or sibling, only moderate to mild anemia was found ( $Hb > 7$ g/dl).The majority of anemic mothers have mild anemia (35.13 %).

Causes of anemia among women are multiple and interacting. However one of the important causes may be related to menstrual blood loss, increased duration of menstrual blood flow.

In children anemia compromises physical growth and mental development (Allan and Gillespie, 2001). Previous studies in Egypt indicated that anemia is an important public health problem among children especially among preschool children (El-Sayed *et al.* 1999). The result of the present study indicates that prevalence of anemia in preschool children and the remaining sibling for both sexes is high ranging 49.48 – 100 %. In preschool children prevalence of anemia reach 49.48

& 56.12 for male and female respectively being higher in female, which represent a public health problem of high severity. El-Zanaty and Way (2001) found that prevalence of anemia was 29.9 % in Egypt, which is different from this result due to different Governorate, different habits, incomes and food habits. The prevalence of anemia in preschool children may be attributed to the negative impact of iron supplementation in antenatal health care facilities because mothers and children don't go there regularly, don't take the pills regularly (because of ignorate or poverty, don't have price of the pills). More than 50 % of the women (mothers) are illiterate, poor (income  $\leq 200$  LE), have bad food habits, bad diet and need more effort to make them understand importance of government program.

The majority of anemic sibling have mild anemia which comprise problem of moderate significant for boys and comprise problem of high significant for girls (table 2) but in general anemia of anemic sibling comprise problem of high significant level of severity (52.25 & 54.03) for both male and female respectively. Previous studies indicated that anemia is more prevalent among preschool children in the young age (El-Sayed *et al.* 1999). The prevalence of anemia in this age may be due to their need of iron intake.

It is well known that iron status of pregnant mothers is a key determinant for the young infants's iron store. One of the most common causes of anemia in infants is prematurity. Population that belongs to a lower socioeconomic status has high incidence of IDA. The high incidence of IDA in infants that belong to low-income families is a well-known fact (Kurz and Johnson-Welch 1994, Creed-Kanashiro *et al.*, 1997, and Raina *et al.*, 1997).

## Recommendation

In Egypt although high prevalence of anemia in mothers and their sibling were found but now a days it is slightly lower than before due to government efforts, so prevention of IDA can improve performance in school, life, avoid behavioral alterations, and assure better growth, thus

<sup>4</sup> EDHS: Egypt demographic and health survey



allowing children to grow healthier through iron supplementation program. In addition, the burden on the country's economy may be reduced if we prevent IDA at an early age, thus reducing health expenditure in the future. According to the recommendations of the American Academy of Pediatrics (1999), infants who are not breastfed should receive iron-fortified formulas containing 4 to 12 mg/L of iron, from birth to 12 months of age.

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## انتشار الأنيميا في مصر (محافظة الغربية)

<sup>1\*</sup>غادة ز ع سليمان، <sup>2\*</sup>مجدي ن عزمي ، <sup>3\*\*</sup>سهها الصفتي  
1-قسم كيمياء حيوية 2- قسم تنقيف غذائي و علوم بيئية 3- قسم تغذية  
\*: المعهد القومي للتغذية-القاهرة، \*\*: جامعة قناة السويس-السويس

**المقدمة:-** الأنيميا هي مظهر نقص الحديد و هي النوع الشائع من نقص التغذية عالميا. و هي تمثل مشكلة كبرى في البلاد النامية خاصة مصر .

**المواد و الطرق:** -تم اختيار 649 أم و احد أبنائها (622 طفل ) ليمثلوا العينة و هم ذو عادات غذائية مختلفة و حالات اقتصادية و اجتماعية مختلفة.. تم تقدير الهيموجلوبين في الأمهات و الأطفال .و تم تسجيل العمر لكل من الأم و الطفل . تم تسجيل التعليم، الوظيفة، الدخل، الحالة الاجتماعية و عدد الأشخاص في المنزل كلما أمكن ذلك.

**النتائج والمناقشة:-** لا توجد أنيميا حادة في الأطفال و الأمهات (هيموجلوبين >7جم/100 مل) و لكن أنيميا متوسطة الى معتدلة (هيموجلوبين <7 جم/100 مل). بلغت نسبة انتشار الأنيميا في الأمهات 47 % و هي تمثل مشكلة ذات درجة عالية من الخطورة. نسبة انتشار الأنيميا في العينة ككل 52.25 % ، 54.03 % للأطفال (الذكور و الإناث على التوالي). و هي تمثل مشكلة ذات درجة عالية من الخطورة . أن سبب الأنيميا في الأطفال قد يرجع إلى فقد الدم خلال الدورة الشهرية و طول المدة. بينما في الأطفال قد يكون بسبب الأمهات المصابات بالأنيميا ، الفقر ، الغذاء السيئ ، العادات الغذائية السيئة مثل شرب الشاي.

**الاستنتاج:-** لكي نقتل نسبة انتشار الأنيميا في مصر (الأطفال و الأمهات ) لابد من تحسين برنامج تدعيم الحديد.