Results

This study was carried out in Qalyube –hospital out patient clinic and NICU follow –up over thirty healthy lactating mothers, neither receiving any medications nor complaining from any chronic diseases. Their infant ages ranged from two week s up to 40days.

General characteristic of the study population:

The healthy lactating mothers, included in our study, were divided into 2 groups (20 case) and (10 case) according to the nutrients analyzed in their breast milk sample the general characteristics of mothers and babies

Table (3) Frequency distribution of epidemiological data of mother

Variable	Number	Percent %	P value
Age			
< 20 years	7	23.3	<0.05
20 – 30 years	22	73.4	
30 – 40 years	1	3.3	
Residence			
urbane	15	50.0	_____
Rural	15	50.0	
Working Status			
Yes	15	50.0	_____
No	15	50.0	
Education			
Educated	14	46.7	>0.05
Non Educated	16	53.3	
HT			
<160 cm	8	26.7	<0.05
>160 cm	22	73.3	
WT			
<70 kg	23	76.7	<0.05
>70 kg	7	23.3	

NVD = Normal vaginal Delivery
C.S = Cesarean Section
HT = Height
WT = Weight

Table (4) Frequency distribution of data related to types of delivery

Variable	Number	Percent %	P value
Type of Delivery			
NVD	20	66.6	< 0.05
C.S	10	33.3	

Table (5) Frequency distribution of epidemiological data of father

Variable	Number	Percent %	P value
Education			
Educated	24	80.0	< 0.01
Non Educated	6	20.0	
Age.			
<30 years	15	50.0	____
>30 years	15	50.0	

Table (6) Frequency distribution of optimal breast feeding practices

Variable	Number	Percent %	P value
On demand			
Yes	29	96.7	< 0.001
No	1	3.3	
Schedule			
Yes	1	3.3	< 0.001
No	29	96.7	
Night Feeding			
1-3 feed	8	26. 7	<0.05
>3 feed	22	73.3	
Day Feeding			
<8 feed	6	20.0	<0.01
>8 feed	24	80.0	

Table (7) Frequency distribution of **practices related to mother infant separation**

Variable	Number	Percent %	P value
Separation			
Yes	18	60.0	>0.05
No	12	40.0	
Cause			
Working	9	30.0	——
Incubator	9	30.0	

Table (8-a)
Frequency distribution of early feeding practices of studied Infants including sex, gestational age (GA),

Variable	Number	Percent %	P value
Sex: Male Female	17 13	56.7 43.3	>0.05
G. A: F.T P.T	30 0	100 -	___
(1) First Breast Feed <1.Hour >1. Hour 6. Hour	 11 19 0	 36.7 63.3	>0.05
(2) Prelacteal given Yes No	 17 13	 56.7 43.3	>0.05

Table (8-b)
Nutritional status of studied infants by body weight (B.wt), body mass index hemoglobin (HB)

Nutritional data	Number	Percent %	P value
(1) B. Wt > 3rd percentile > 90th	 30 0	 100	___
(2) H.B <10mg >10mg	 0 30	 100	___
(3) M.A.C <8cm >8 cm	16 14	53.3 46.7	>0.05

Breast milk Nutrient value (at zero Hours) versus reference milk

Nutrient value:

The value of breast milk nutrients studied in our work (at zero hour) was compared with reference values (Currenand Bareness, 2000). Table shows values of breast milk nutrients studied compared with reference values it was found that:

Fat content: The mean fat content in the collected breast milk sample was 4.42g/l (± SD 1.9) which is highly significant lower ($P<0.05$) than the references mean fat content of mature breast milk which is 4.5g /l

Protein content:

The mean protein content in collected breast milk sample was 1.36 g/l (±SD 0.3) which shows insignificant difference ($p>0.05$) from the reference mean protein content in mature breast milk is 1.6g/l

Calcium content:

The mean calcium content the collected breast milk sample was 26.6g/l (±SD 0.4) which is highly significant lower ($p<0.001$) than the references mean calcium content in breast milk 30g/l

Zinc content:

The mean zinc content in the collected breast milk sample was 1.68g/l (±SD 0.5), which is highly significant lower ($p<0.001$) than the references mean content zinc content in mature breast milk 1.8 mg/l

Iron content:

The mean iron content in the collected breast milk sample was 0.9 g/l (+SD0.2) which show highly significant difference ($p<0.001$) from the references mean iron content in mature breast milk 1g/l

Vitamin D content:

The mean vitamin D in the collected breast milk sample was 74.4 g/l (+SD2.4) which is highly significant lower ($p<0.001$) than the references mean vitamin D content in mature breast milk 75g/l

IT was found that although the mean values of macronutrients, vitamin D and zinc studied in our breast milk samples, were lower than the mean difference values; mean as well as individual values are still within the international references range,

Table (9): Breast milk nutrient values (at zero hour) compared with reference milk nutrient values:

Nutrient	Breast milk sample	Reference			P value
Macronutrient	Mean (±SD	Range	Mean	Range	
Fat gm	4.42 (± 1.9)	5-10	4.5	7-20	<0.05 insignificant
Protein gm	1.36 (± 0.3)	1-5	1.6	1 -16	>0.05 significant
Calcium gm	26 .6 ±(0.4)	25-35	30	25-70	<0.001 highly - sag
Iron gm	0.9 (± 0.2)	1-3	1	1-10	<0.001 Hs
Vitamin D IU	74 .4 ± (2.4)	70-85	75	55-85	> 0.001 HS
Zinc gm	1.68 ± (0.5)	00.8 -1.	1.8	1-3.0.2	<0.001 HS

P value is considered significant if < 0.05

>0.05 significant

<0.01 highly significant

<0.001 highly significant

Vitamin D was assessed in 10 samples (10 cases lactating mother

Effect of storage of breast milk samples

The effect of storage of breast milk samples for one week in the first shelf of refrigerator (4-6 ºc)and for one month in freezer (-4 to -8 cº) was studied. Analysis of data was done by paired T-test, to find out if there is a significant change in the studied breast milk nutrient after storage of breast milk samples.

Table 3 shows the effect of storage of breast milk samples for one week in the refrigerator mainly first shelf of refrigerator (4t6 ºC) values are expressed in the form of mean (± SD)

Table (10) Comparison of mean values of breast milk nutrient studied at zero hours & after one week storage in the refrigerator.

Nutrient	Mean at zero hour	Mean after one week	P value
Macronutrient			
Fat	4.42 (±1.9)	4.88(± 1.8)	>0.05 (NS)
Protein	1.36 (± 0.3)	1.31(± 0.4)	>0.05 (NS)
Calcium	26 .6 (± 0.4	26.89(±0.3)	<0.001 HS
Iron	0.9 (±0.2)	0.65 (± 0.2)	<0.001 HS
Zinc	1.68 (± 0.5)	1.60 (± 0.5)	<0.001 Hs
Vitamin D	74.4(± 2.4)	72.0(± 1.9)	<0.001 HS

P value is considered significant if < 0.05

Vitamin D level was assessed in only 10 samples (30 lactating mother)

Storage of expressed breast milk for one week in refrigerator (4-6C) showed an insignificant inecrease in fat content of breast milk from 4.42 (± 1.9) to 4.88(± 1.9), P value >0.05 (NS) as shown in figure (13).

Figure (13) Effect of storage of breast milk for one week in refrigerator (4º c) on fat content

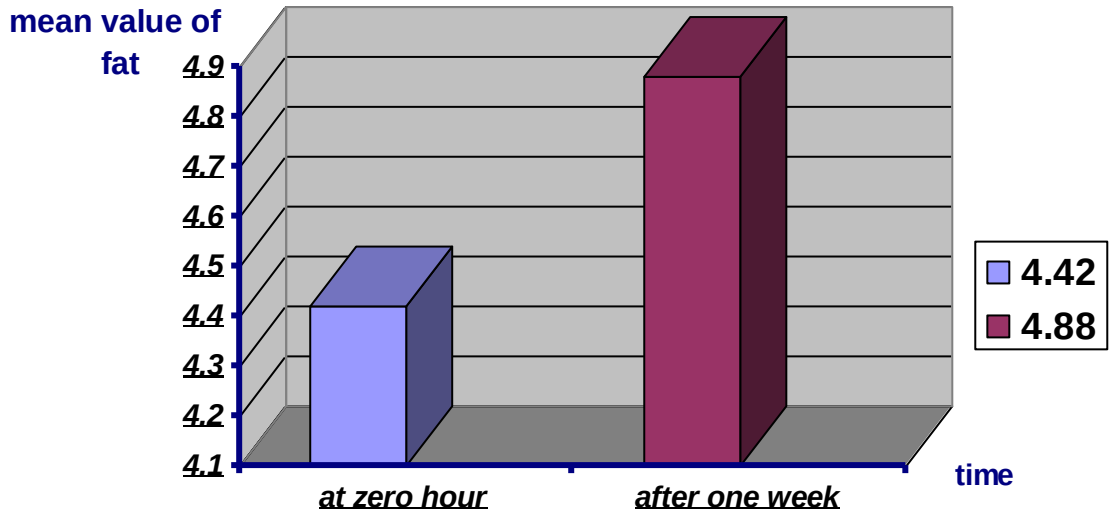


Table 10 and figure 14 shows that there was a significant decrease in total protein content of breast milk from 1.36 (0.3) to 1.31 (+ 0.4) p value <0.05 (significant).

Figure 14: effect of storage of breast milk for one week in refrigerator (4ºc) on protein content (g/l)

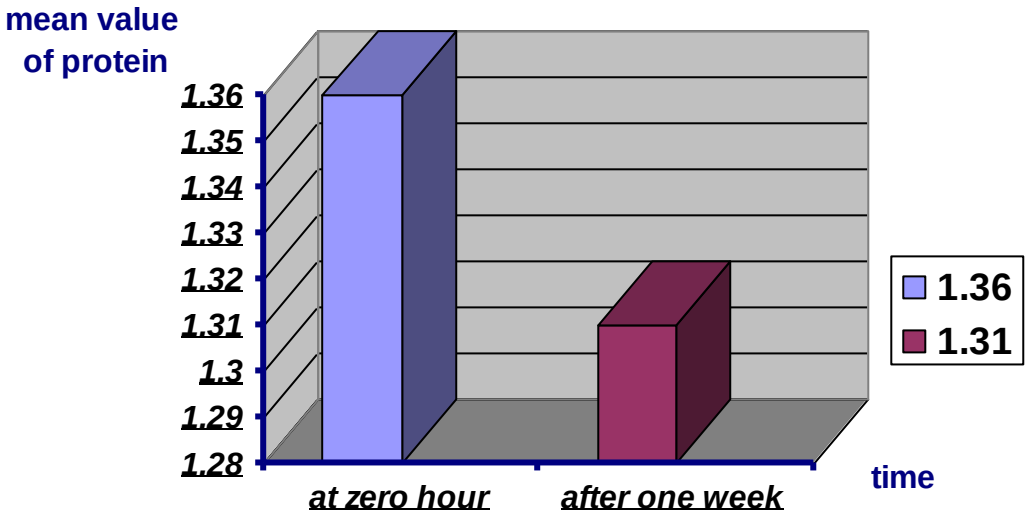


Table 10 and figure 15 shows a highly significant inecrease in calcium content of breast milk from 26.6 (+ 0.4) to 26.88 (+ 0.3) p value >0.001 (highly significant).

Figure (15): Effect of storage of breast milk in refrigerator (4 ºC) for one week on calcium content (g/l)

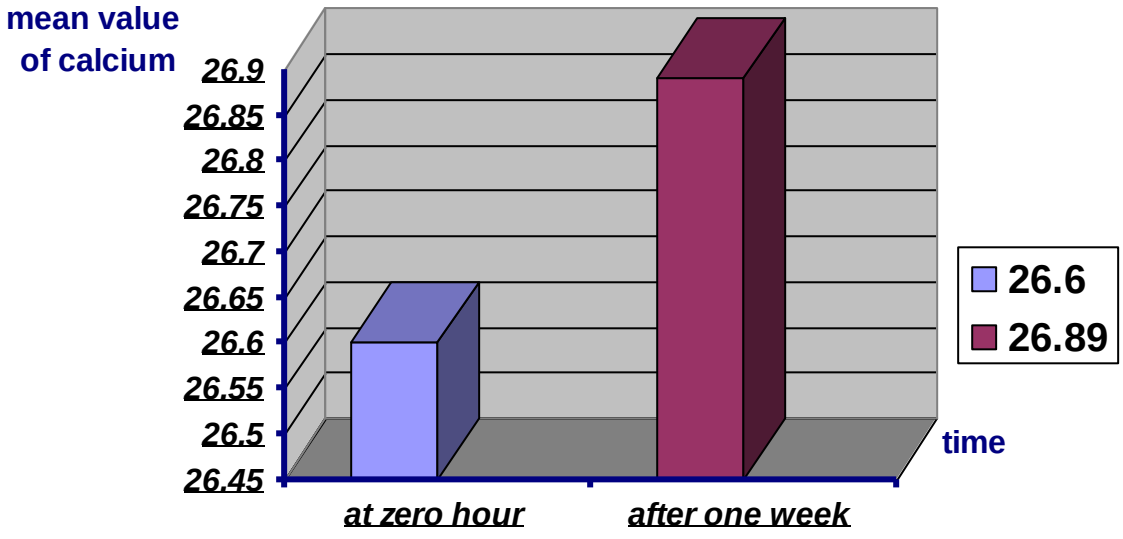


Table (10) and figure (16) show a highly significant decrease in iron content of breast milk from (± 0.9) to 0.6) ± 0.2) p value >0.001(highly-significant).

Figure (16): Effect of storage of breast milk in refrigerator (4º C) for one week on iron content (g/l)

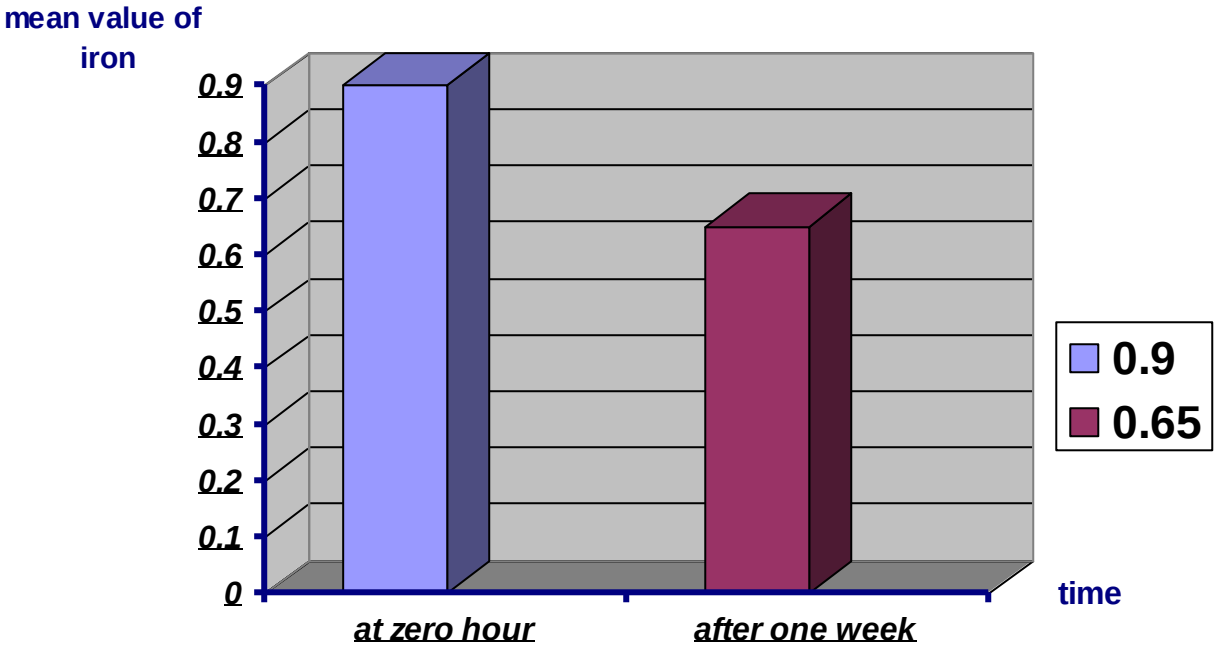


Table (10) and figure (17) show a highly significant decrease in zinc content of breast milk from 1.68 (± 0.5) to 1.60 (+0.5) p value >0.001 Highly–significant

Figure (17): Effect of storage of breast milk in refrigerator (4ºC) for one week on zinc content

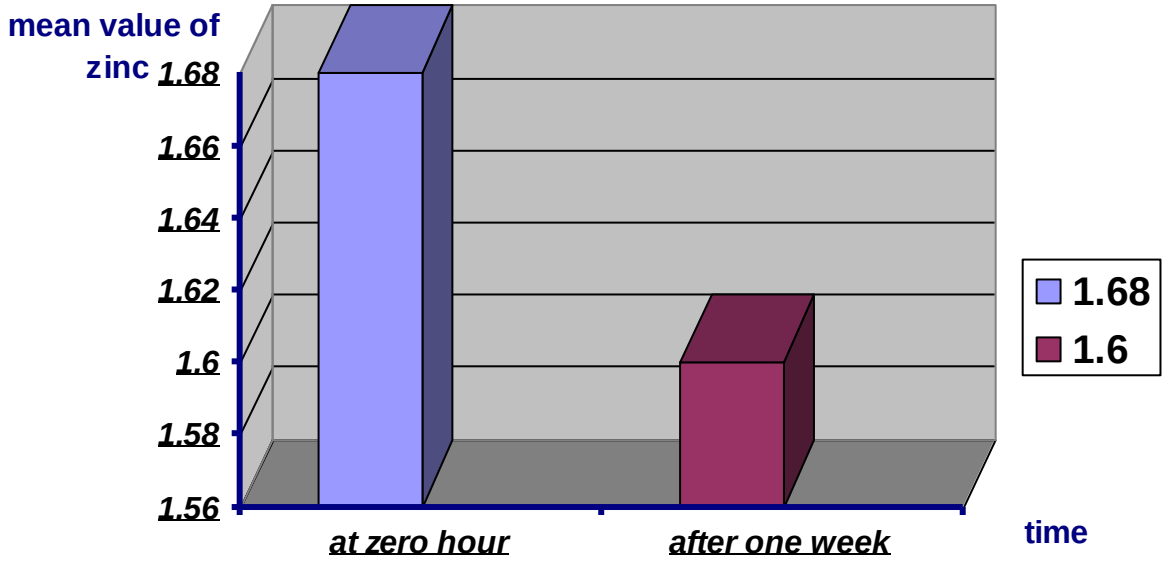
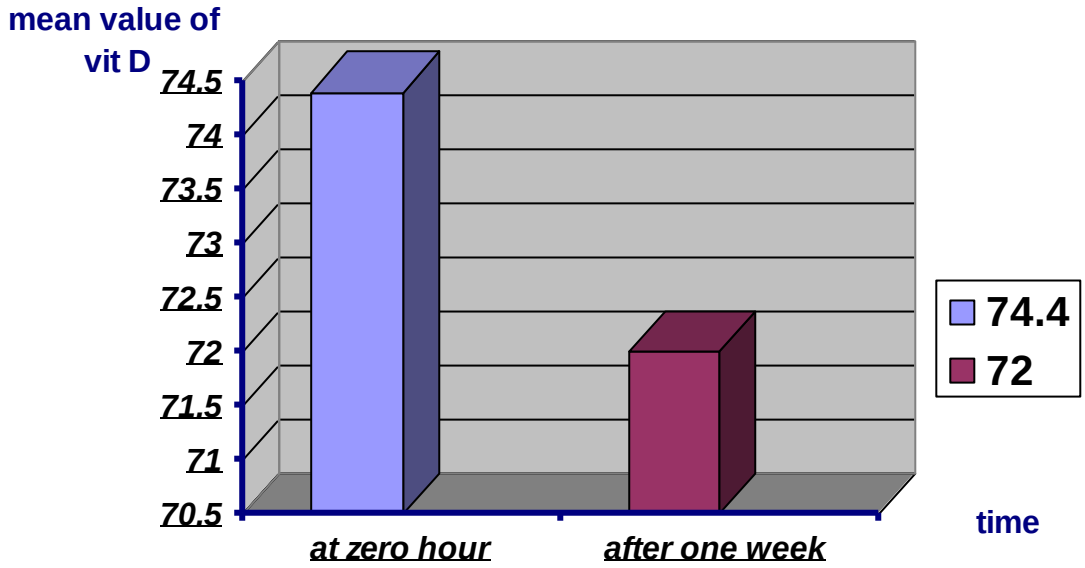


Table (10) and figure (18) show a highly significant decrease in vitamin D of breast milk from 74 .4 (+_2.4) to 72 .0 (+_1.9)

Figure (18): Effect of storage of breast milk in refrigerator (4ºc) for one week on vitamin D concentration (mg/l)



Effect of Storage of Breast milk for one month

Table 11 shows the effect of storage of breast milk samples for one month in the freezer (-4to -8º C) values are expressed in the form of mean (±SD).
Storage of expressed breast milk for one month in freezer (-4 -8 C) lead to a non - significant decrease in fat of breast milk from 4.42 (± 1.9) to 5.26 g/l (+2.3) p value >0.05 (Insignificant) as shown in table 11 fig 19

Table (11): Mean value of breast milk at zero hour & after one month storage in freezer (-4to -8º C)

Nutrient	Mean at zero hour	Mean at one month	P value
Macronutrient (g/l)			
Fat	4.4(± 1.9)	3.26 (± 2.3)	<0.05
Protein	1.36(± 0.3)	1.28(± (0.4)	>0.05
calcium	26.6(± 0.4)	26.77(± 0.4)	<0.001
Iron	0.9 (±0.2)	0.67(± 0.2)	<0.001
Zinc	1.68(±0.5)	1.59 (±0.5)	<0.001
Vitamin D	74.(± 2.4)	69.5(± 1.22)	<0.001

Fig 19: Effect of storage of breast milk for one month in freezer (-4 to-8 ºC) On its fat content (g/l).

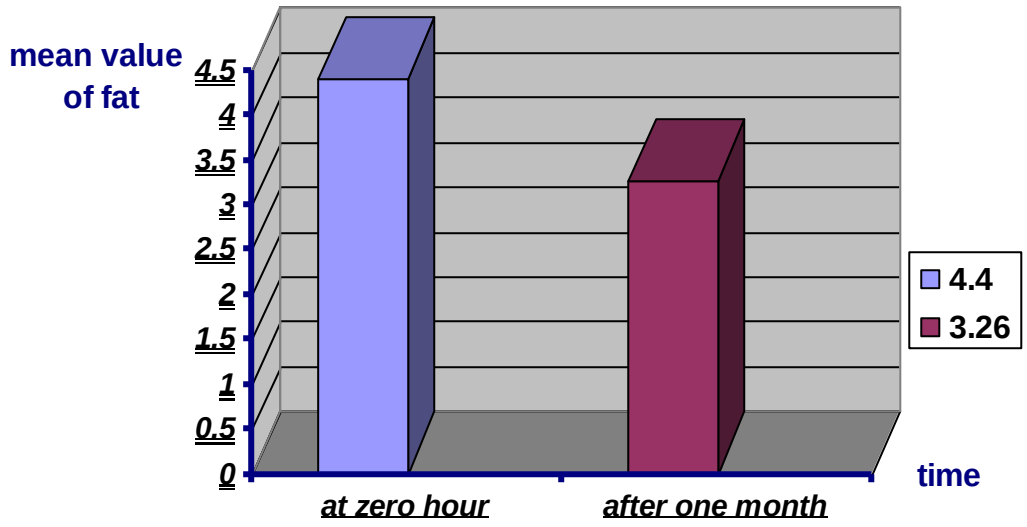


Table 11 and figure 20 show a non significant decrease in protein content of breast milk from 1.36 (± 0.3) to 1.28(+0.5) over one month storage at P value>0.05 (insignificant)

Fig (20): the effect of storage of breast milk for one month in freezer (-4 -8º C) on its protein content (g/l)

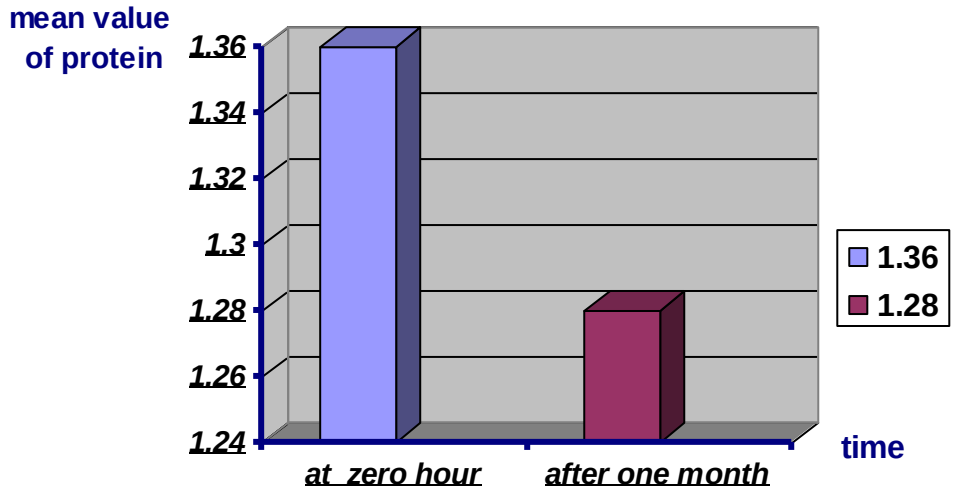


Table 11 and figure 21 show a highly significant decrease in calcium content of breast milk from 26.6 (+0.4) to 26.77 (± -0.4) at p value <0.001 (highly significant).

Figure (21): the effect of storage breast milk for one month in freezer (-4 -8 ºC) on its calcium content (g/l)

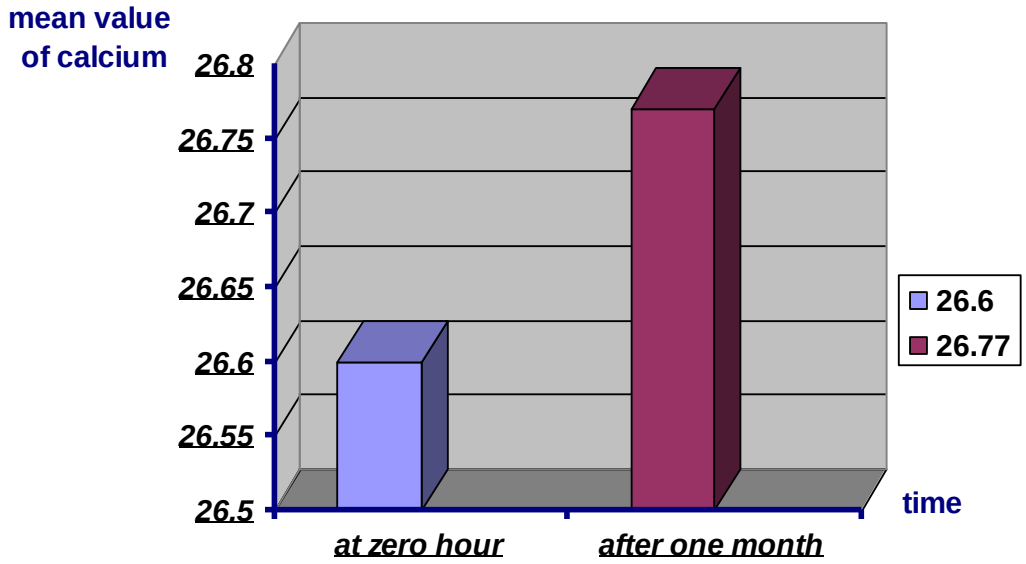


Table 11 and figure 22 show a highly significant decrease in iron content of breast milk from 0.9 (+0.2) to 0.67 (+0.2) at p value <0.001 (highly significant)

Figure (22): the effect of storage of breast milk for one month in freezer (-4 to -8 ºC) on its iron content

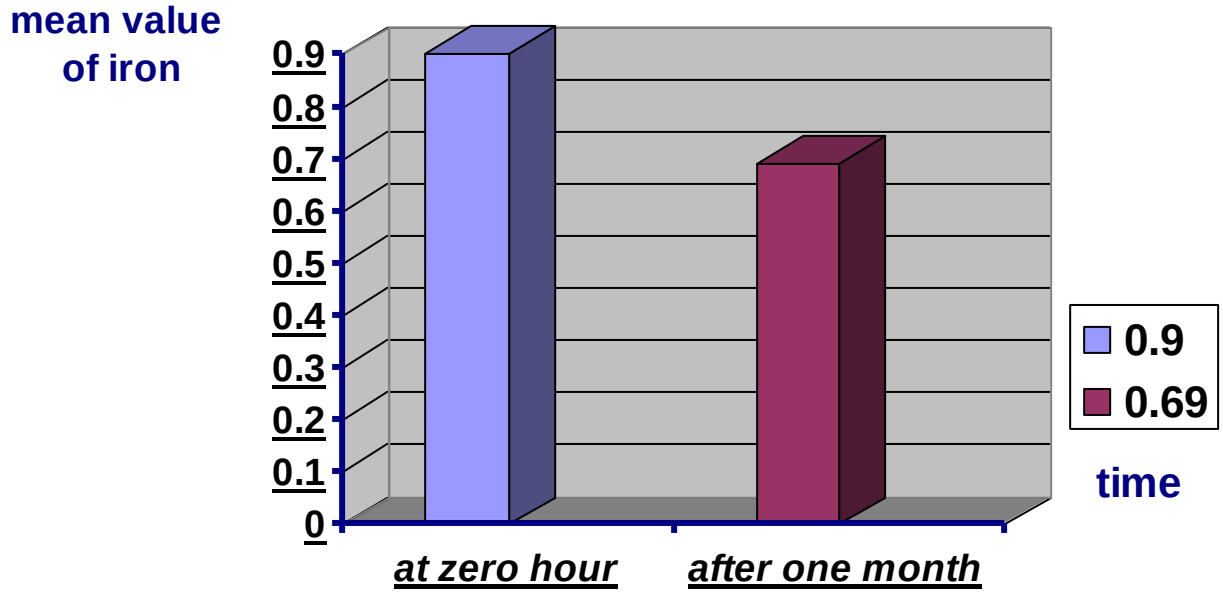


Table 11 and figure 23 show a highly significant decrease in zinc content of breast milk for one month from 1.68 (± 0.5) to 1.59 (± 0.5) p value <0.001 (highly significant)

Figure (23) the effect of storage of breast milk for one month in freezer (-4 - 8 ºc) on its zinc content (g/l)

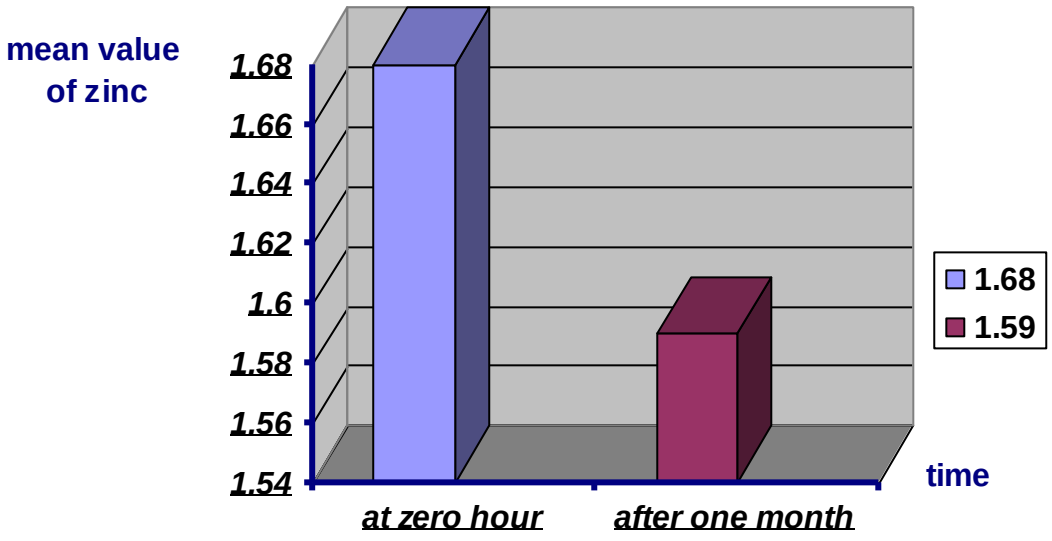
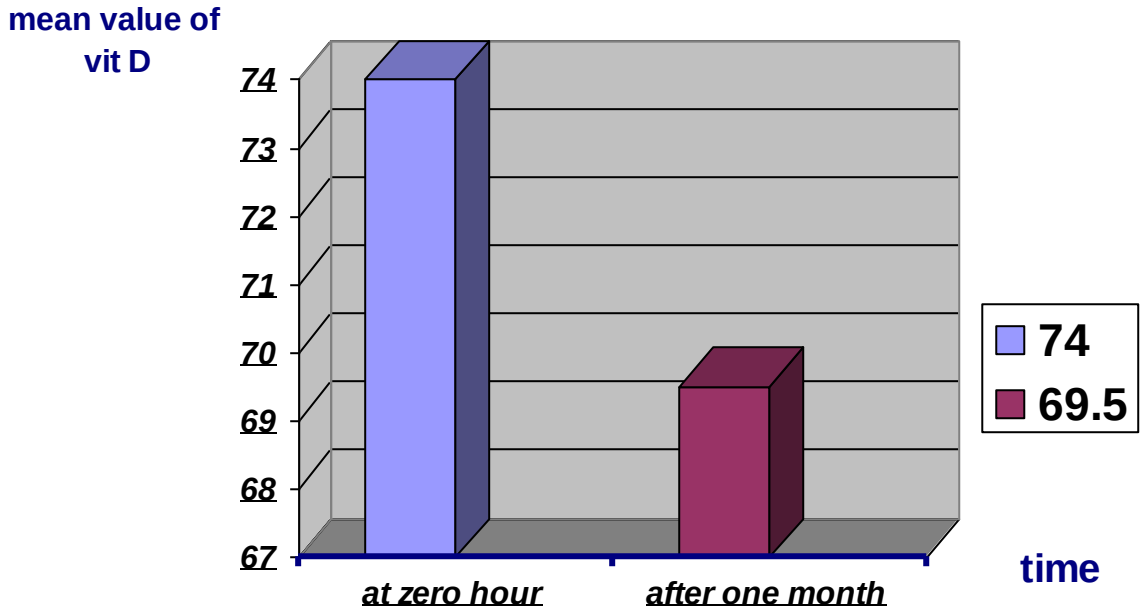


Table 11 and figure 24 show a highly significant decrease in vitamin D content of breast milk from 74.4 (± 2.4) to 69.5 (+1.22) p value (highly significant)

Figure (24): the effect of storage of breast milk for one month in freezer (-4 - 8 ºC) on its vitamin D content (g/l)



Correlation coefficient and different variable

Table (12) correlation coefficient "r" between Fat and different variable

Fat / Variable	r	P
Age of mother	0.195	≥0.05
BMI of mother	0.217	≤0.05
HB %	0.1122	≥0.05

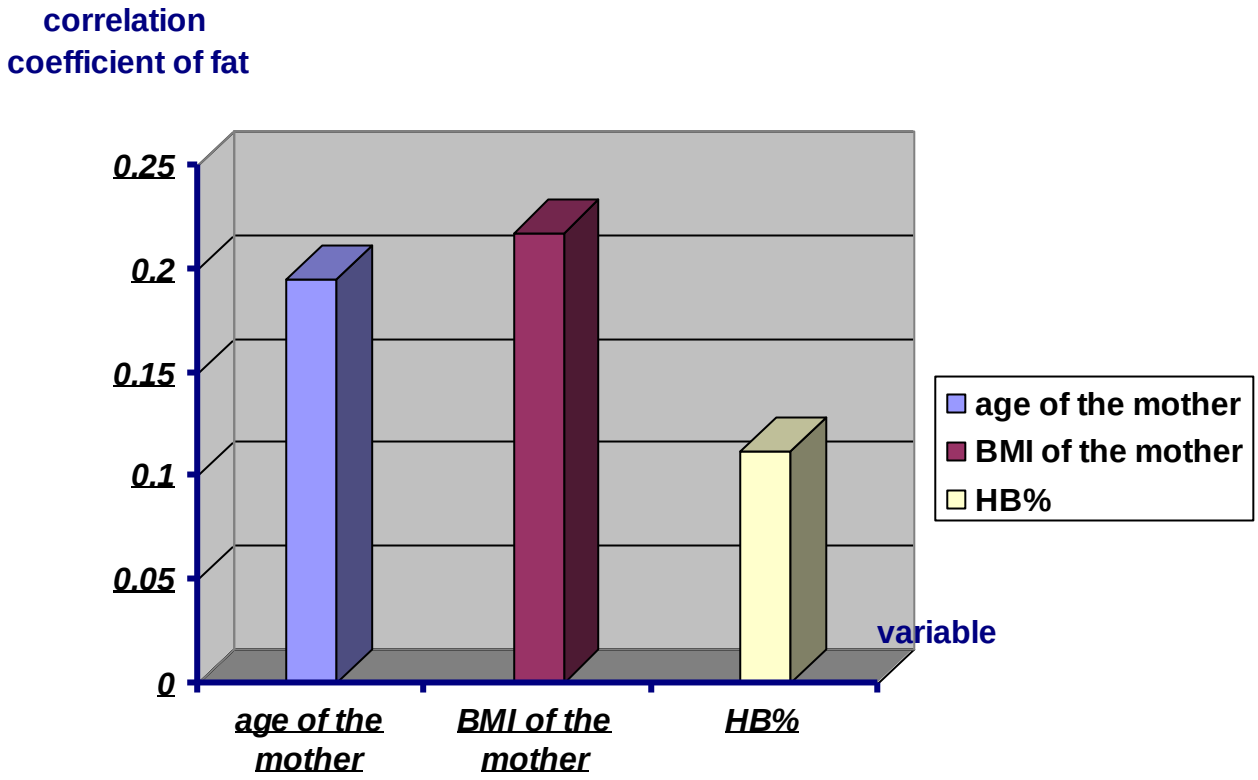


Figure25: value >0.05 Negative correlation between fat and different value

Table (13) correlation coefficient "r" between Protein and different variable

Protein / Variable	r	P
Age	0.219	?0.05
BMI	0.1102	=0.05
HB	0.018	=0.05

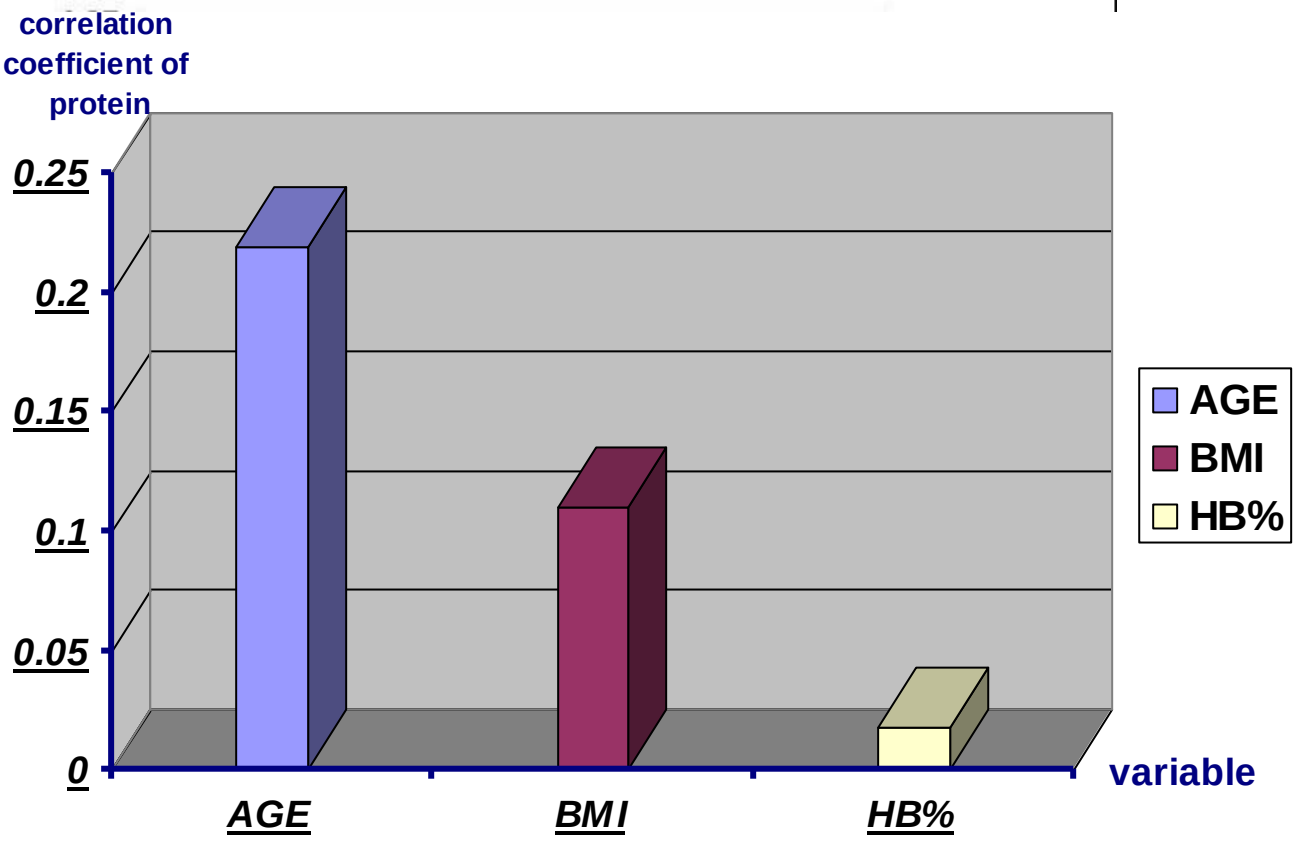


Figure 26 shows negative correlation between protein and different value

Table (14)correlation coefficient "r" between Ca and different variable

Ca	r	P
Age	0.214	≤0.05
BMI	0.1075	≥0.05
HB	-0.002	≥0.05

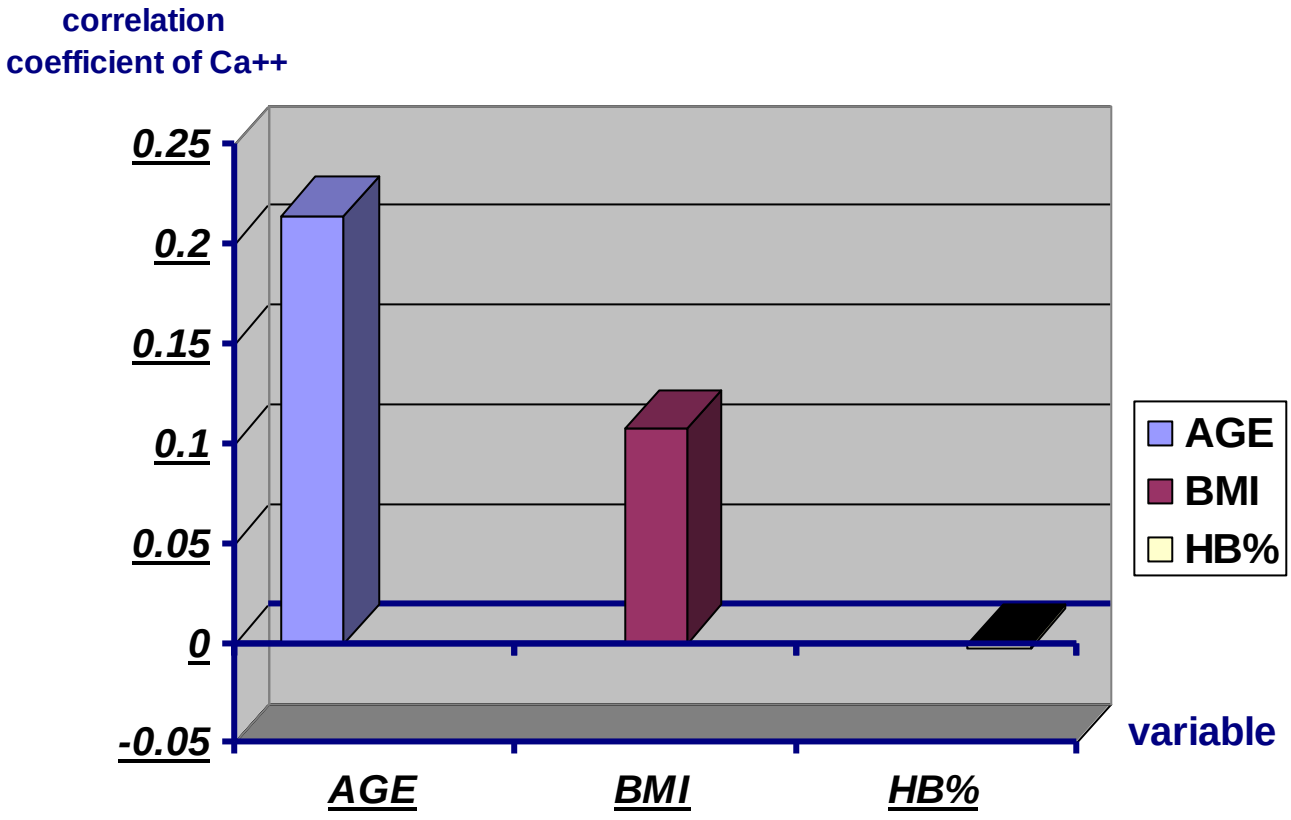


Figure (27) shows Negative correlation in age in calcium and Positive co rlation in body mass index and HB hemoglobin

Table (15) correlation coefficient "r" between Fe and different variable

Fe	r	P
Age	0.019	≥0.05
BMI	-0.164	≥0.05
HB	0.2182	≤0.05

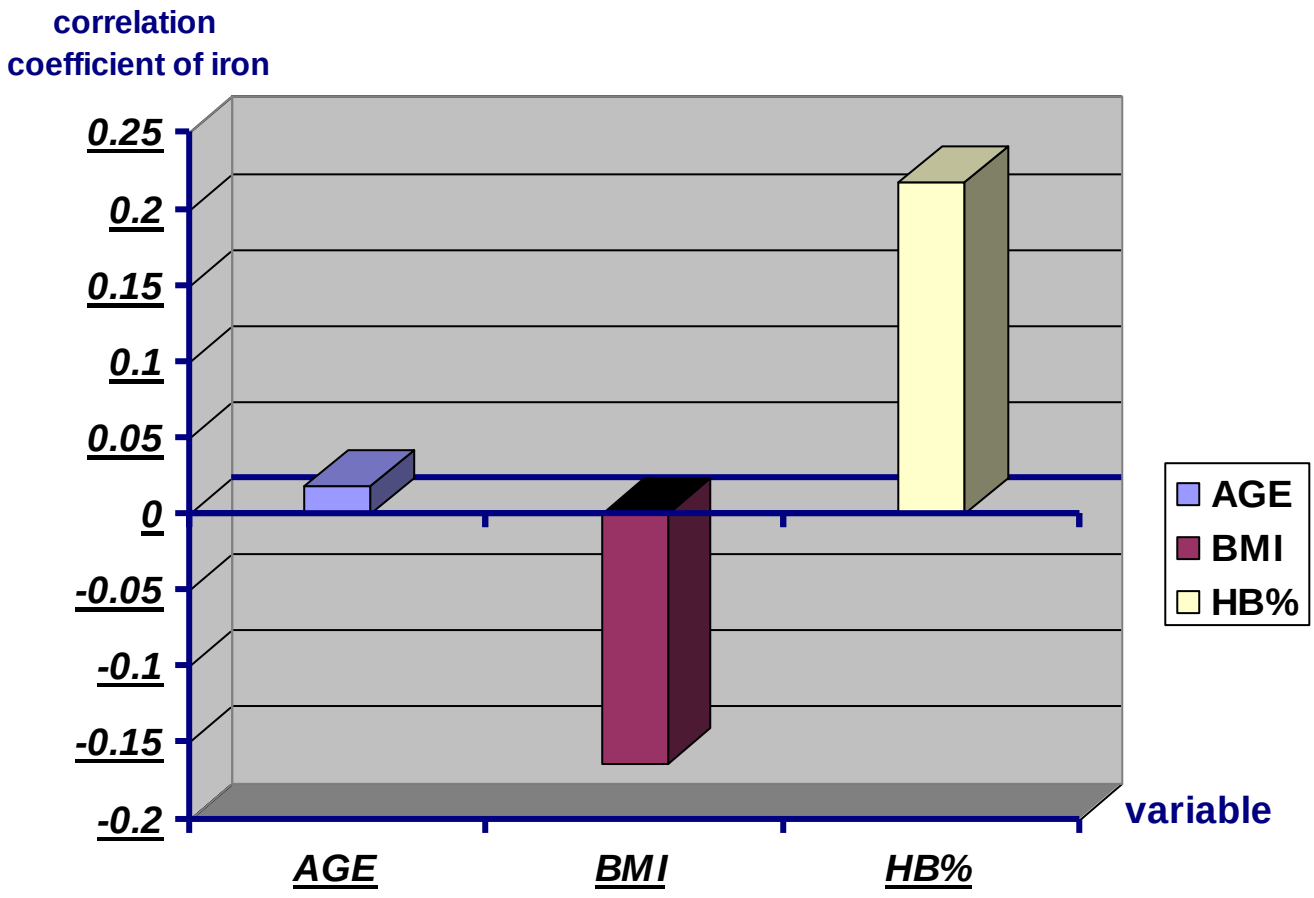


Figure (28): Positive correlation in age and body mass index but there are negative correlation in hemoglobin

Table (16)correlation coefficient "r" between Zinc and different variable

Zinc / Variable	r	P
Age	0.231	≤0.05
BMI	-0.281	≤0.05
HB	0.0055	≤0.05

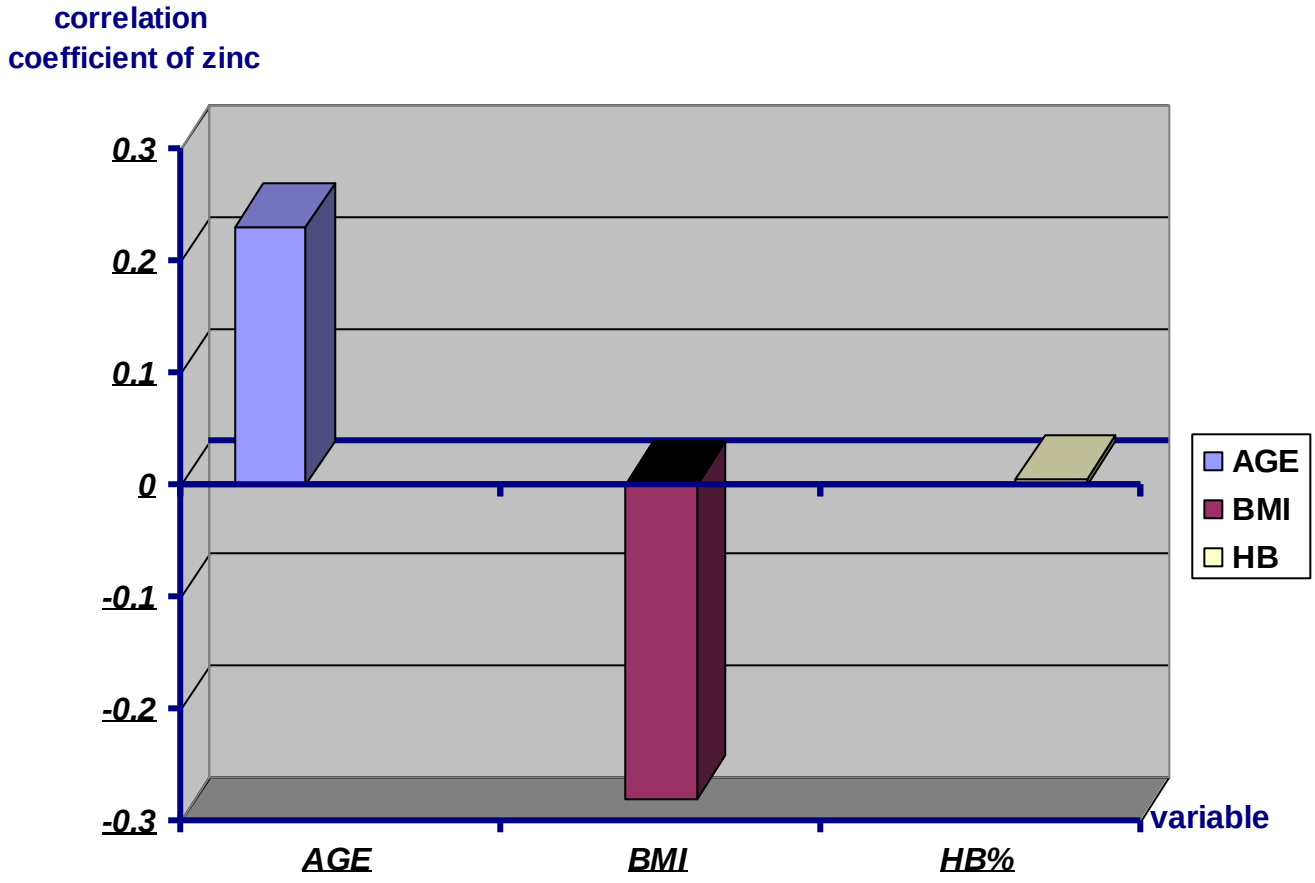


Figure (29) shows negative correlation in age in zinc but there are positive correlation in body mass index and hemoglobin

Table (17)correlation coefficient "r" between vit D and different variable

D / Variable	r	P
Age	0.0234	≤ 0.05
BMI	0.0855	≥0.05
HB	0.0568	≥0.05

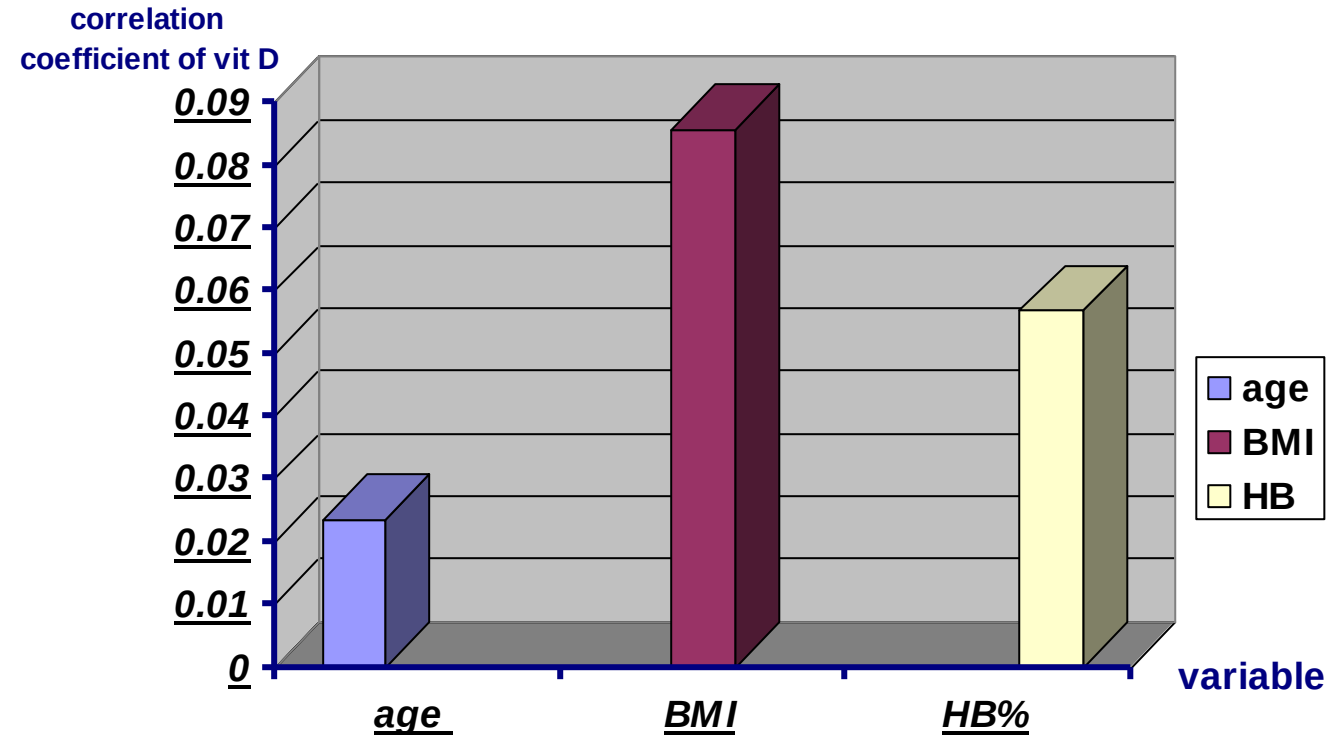


Figure (30) shows positive correlation in age, body mass index and hemoglobin in vitamin D and different value

TABLE (18) Mean value of different Variables among cases According at Residence

Residence Variable	Rural η=45	Urban η=45	t	p
fat	3.8(+/_)1.2	4.9(+/_)2.4	2.75	≤0.01
protein	1.3(+/_)0.3	1.4(+/_)0.3	1.58	≥0.05
Ca+	26.8(+/_)0.3	26.4(+/_)0.4	5.4	≤0.001
Fe+	0.94(+/_)0.3	0.86(+/_)0.2	1.49	≥0.05
zinc	1.5(+/_)0.4	1.9(+/_)0.9	2.72	≤0.01
Vit D	74.4(+/_)2.3	74.4(+/_)2.76		

Table (19) correlation coefficient "r" between vit D and different variable

D / Variable	r	P
Age	0.0234	≤ 0.05
BMI	0.0855	≥0.05
HB	0.0568	≥0.05

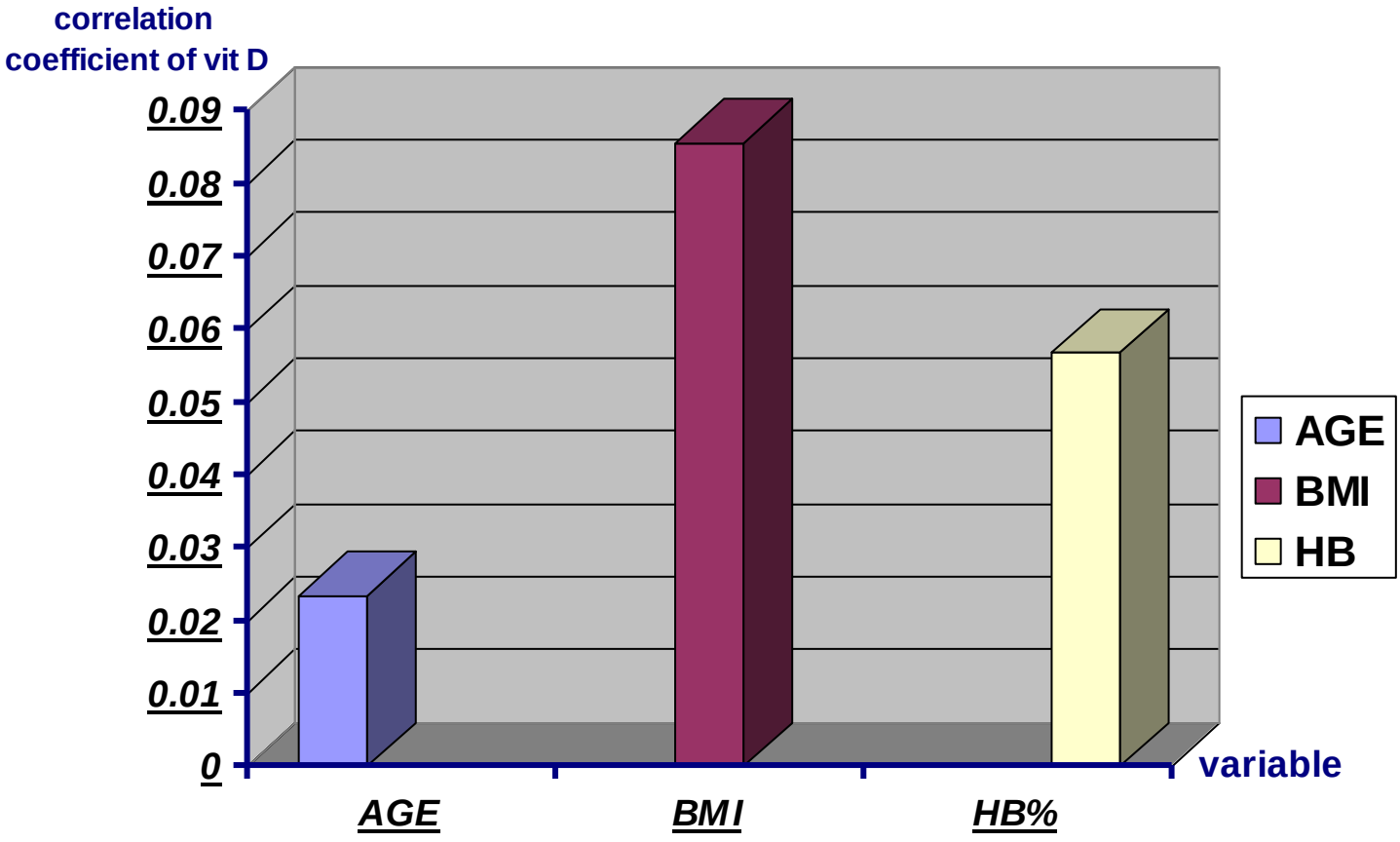


Table (20)

Mean vale of nutrition indices of baby

variable	Mean value
Hb	14.5 (+/-) 1.4
Wt	4.11 (+/-) 0.5
Ht	50.6 (+/-) 1.1
BMI	16 (+/-) 2

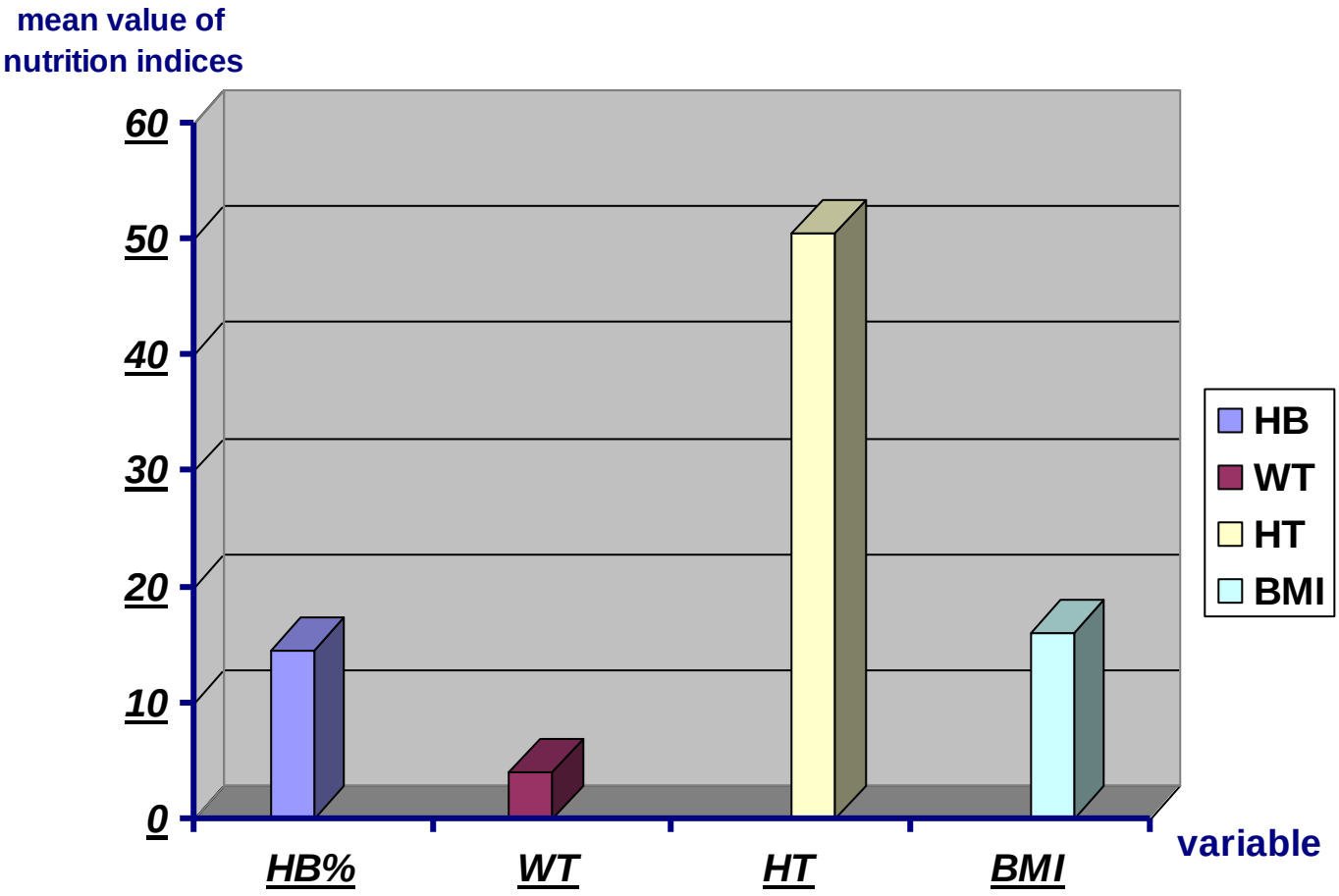


TABLE (21) Mean value of Ca among cases at different

Ca / time	Mean value	Mean value of the difference	SE	Period t	p
zero	26.6(+/_) 0.4				
1 week	26.89(+/_) 0.3	0.29(+/_)0.45	0.05	6.12	≤0.001
1 month	26.77+/_) 0.4	0.17(+/_)0.5	0.05	3.23	≤0.001

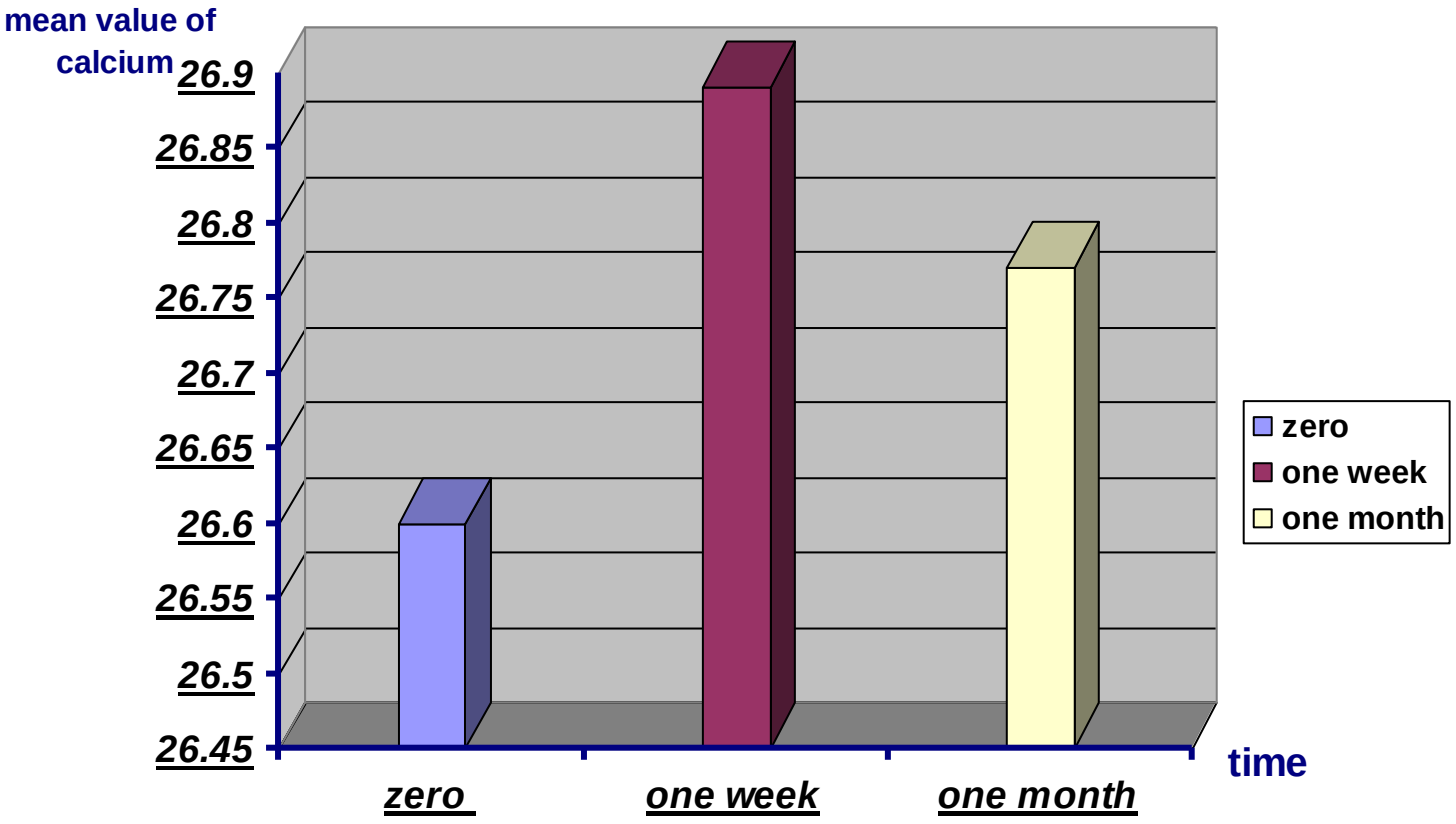


TABLE (22):

Mean value of nutrition indices of the mother

Variable	Mean value
HB	11.3(+/_) 0.4
WT	63.4(+/_) 83
BMI (WT / HT)	25(+/_) 4
HT	158(+/_) 4.6

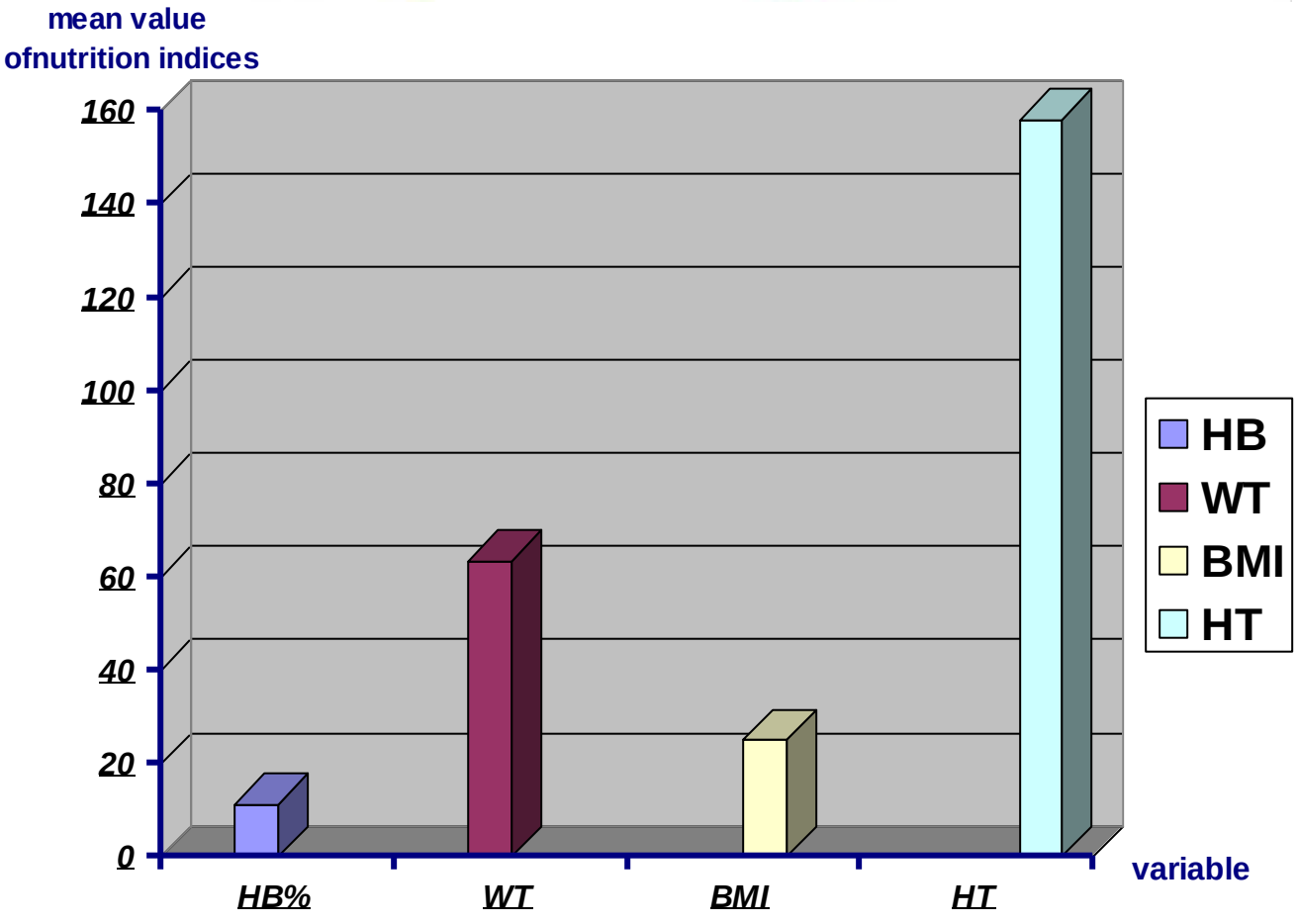


TABLE (23) Mean value of fat among cases at different

Fat / time	Mean value	Mean value of the difference	SE	Period t	p
zero	4.42(+/-)1.9				
1 week	4.88(+/-) 1.8	0.46(+/-)2.7	0.28	1.62	≥0.05
1 month	5.26(+/-) 2.3	0.84(+/-)0.5	0.36	2.34	≤ 0.05

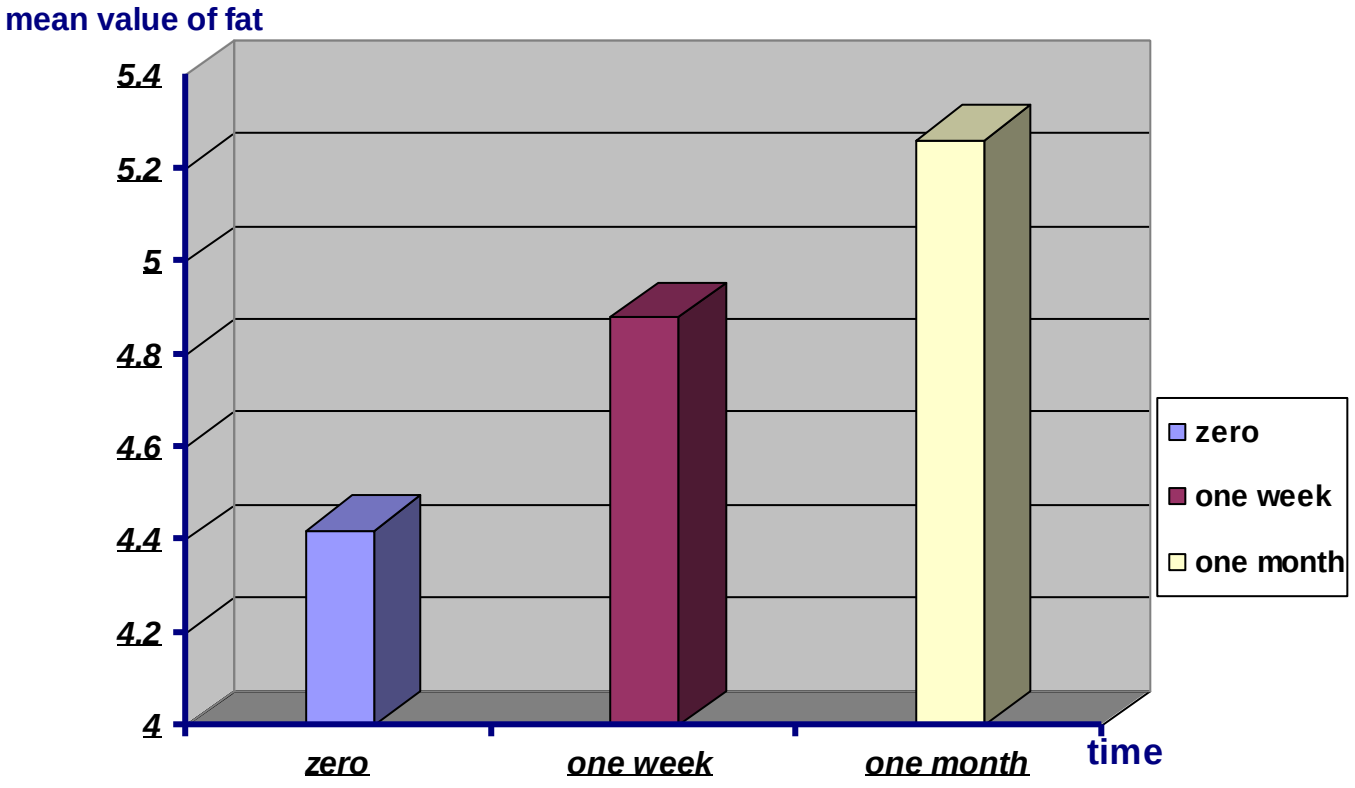


TABLE (24) Mean value of Fe among cases at different Times

Fe / time	Mean value	Mean value of the difference	SE	Period t	p
zero	0.9(+/_)0.2				
1 week	0.65(+/_)0.2	0.25(+/_)0.2	0.02	11.86	≤0.05
1 month	0.67+/_)0.2	0.23(+/_)0.2	0.02	10.91	≤0.05

mean value of iron

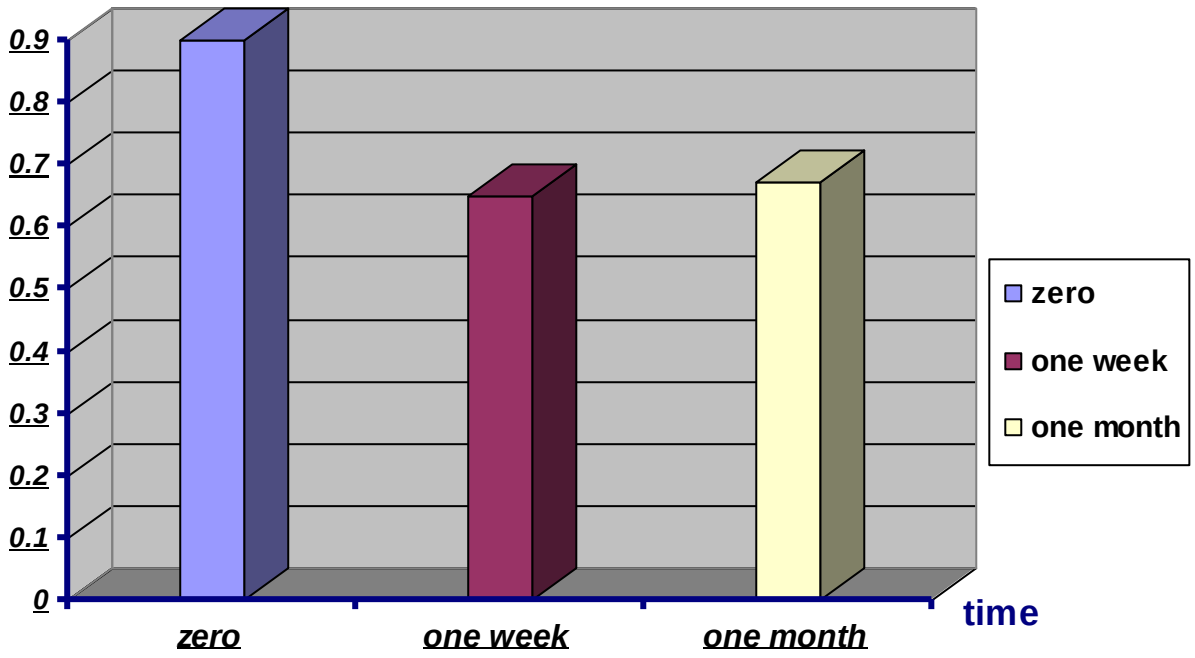


TABLE (25) Mean value of protein among cases at different times

Protein / time	Mean value	Mean value of the difference	SE	Period t	p
zero	1.36(+/-) 0.3				
1 week	1.31(+/-) 0.4	0.05(+/-)0.3	0.03	1.58	≥0.05
1 month	1.28+/-) 0.5	0.08(+/-)0.4	0.04	1.9	≥0.05

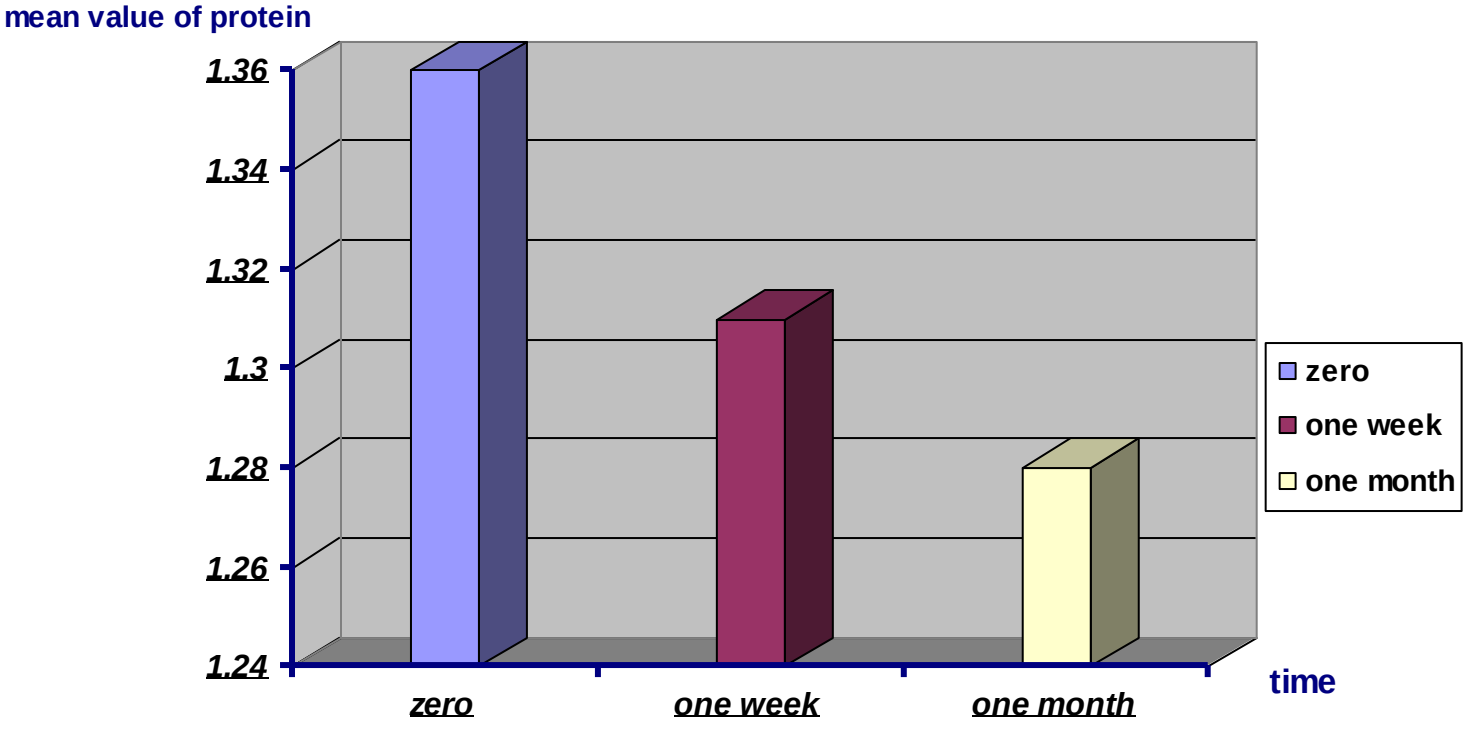


TABLE (26): Mean value of nutrition

Zinc / time	Mean value	Mean value of the difference	SE	Period t	p
zero	1.68(+/_) 0.5				
1 week	1.60(+/_) 0.5	0.08(+/_)0.2	0.02	3.79	≤0.001
1 month	1.59+/_) 0.5	0.09(+/_)0.2	0.02	4.27	≤0.001

mean value of zinc