Results

The present study included forty infants and children with critically illnesses due to one or more organ system failure who were admitted to the pediatric Intensive care unit of a New Children Hospital, Benha University Hospital and Cairo University hospital from February 2009 to October 2009 twenty two were males and eighteen were females. Twenty sex and age matched health children constituted the control group. The results of our study are presented in the following tables and figures.

Table (1): Distribution of the study groups according to sex

Study group / Sex	Cases		Control		Total	
	No	%	No	%	No	%
Males	22	55	12	60	34	56.7
Females	18	45	8	40	26	43.3
Total	40	100.0	20	100.0	40	100.0

Chi-square $(X^2) = 0.14$ $p > 0.05$

Table (1) and fig(1,2). Show: sex distribution among patients under study males in the studied cases represented 55% and females represented 45%. While in controls, males represented 60% and females representing 40%.
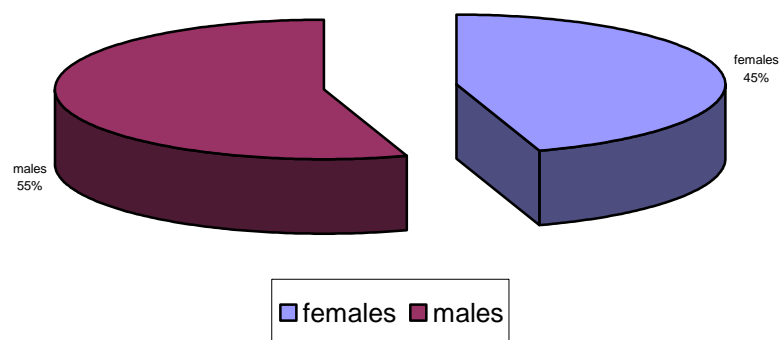
figure (1) sex distribution among cases

females
45%

males
55%

☐ females ☐ males

figure (2) sex distribution among control group

females
40%

males
60%

☐ females ☐ males
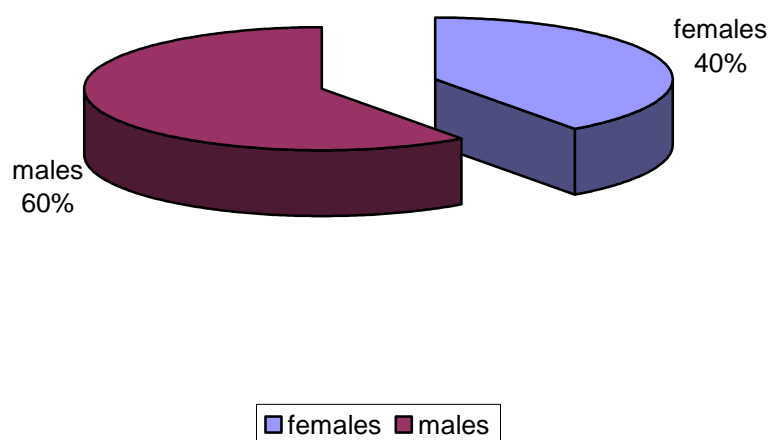
Table (2): Causes of system failure among patient under study.

Causes	No	%
1- Pneumonia.	11	27.5%
2- Gastro enteritis.	10	25%
3- Post-surgical admission.	9	22.5%
4- Sepsis.	8	20%
5- C.N.S infections.	2	5%
Total	40	100.0

Table (2) and figure(3) show: that pneumonia represents the majority of cases 27.5% while C.N.S infections represent the minority of cases 5%.

Table (3): Distribution of system failure among patients under study according to type of system failure

Type of SF	No [Pat-n= 40]	%	P
Single	26	65.0	< 0.05
Multiple	14	35.0	

Regarding the number of system failure table (3) and fig (4) show that there is a statistically significant difference between cases have single system failure (65%) and cases have multiple single failure (35%) P < 0.05.

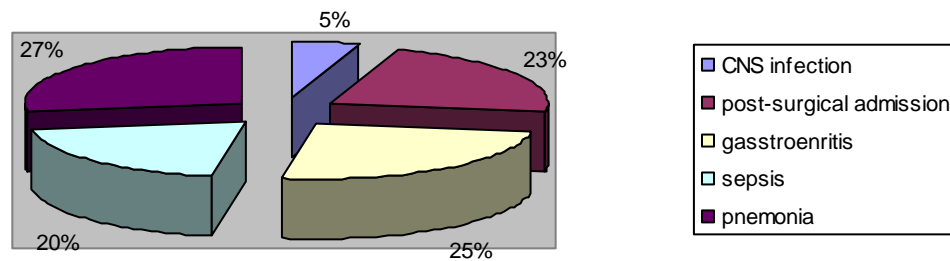**figure (3) causes of system failure among patient under study**

- CNS infection
- post-surgical admission
- gasstroenritis
- sepsis
- pnemonia

5%

23%

27%

20%

25%

Figure (4) distribution of system failure among patients under study

35%

65%

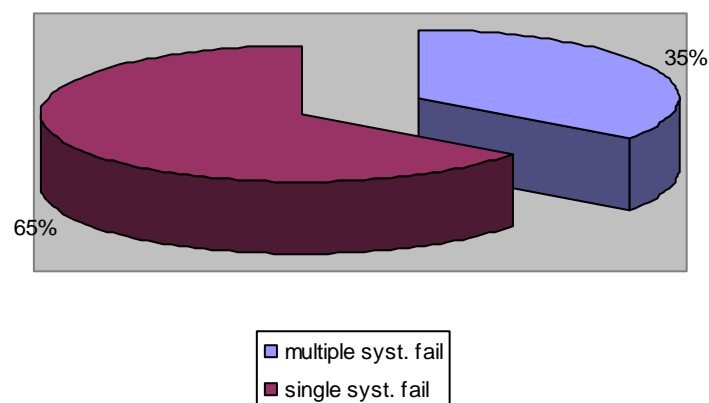- multiple syst. fail
- single syst. fail

Table (4): Mean total serum zinc (ug %) in critically ill patients on admission and day three and their significance to control.

Mean total serum Zinc (ug%)	Control group No. = 20	Critically ill patient No = 40	P value
On admission Mean ± SD	89 ± 3.1	52.5± 5.3	< 0.001
At 3 days Mean ± SD	-	55.1 ± 9.1	< 0.001

Table (4) and figure(5) show mean total serum zinc in studied group. There is highly statistically significant difference in mean total serum zinc between critical patients and control group on admission as well as on day three of admission P < 0.001.

Table (5): Mean total serum copper (ug %) in critically ill patients on admission and day three and their significance to control.

Mean total serum Cupper(ug %)	Control group No. = 20	Critically ill patient No = 40	P value
On admission Mean ± SD	111 ± 3.1	97	
At 3 days Mean ± SD	-	102	< 0.05

Table (5) shows mean total serum copper in studied group that there is no statistically significant difference serum of copper between critical patients and control group on admission as well as day three of admission. P > 0.05.
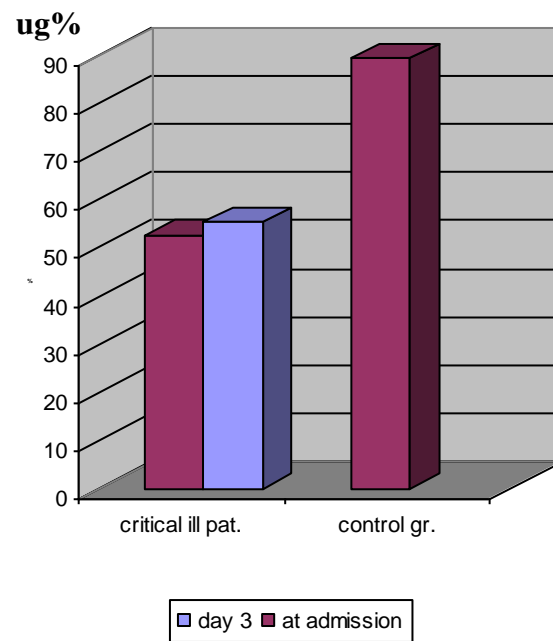
Figure (5) Mean of S. Zinc among the study groups

Table (6): Mean total serum zinc (Ug%) at admission and 3rd day among the study cases according to number of system failure.

Mean total serum zinc (ug%)	Single S.F. no = 26	multiple S.F No. 14	P
On admission Mean ± SD	54.6 ± 4.01	47.2± 4.1	< 0.001
AT 3rd day Mean ± SD	59.1 ± 7.6	49.6±8.5	< 0.01

Table (6) and figure (6) show mean total serum zinc among patients under study according to the number of system failure. There is highly statistically significant difference in mean total serum zinc between critically ill patients with single organ system failure and those with multiple organ system failure on day of admission (P< 0.001) as well as on day three of admission.

Table (7): Mean total serum zinc (ug %), leucocytic count, absolute band count and C. reactive protein on admission and 3 day later and their significance to the control group.

	Control group No = 20 Mean ± SD	Critically ill patient (n=40) (study group)			
		On admission Mean ± SD	P Vs control	At 3rd day mean ± SD	P vs control
total serum zinc (Ug%)	89 ± 3.1	52.5 ± 5.3	<0.001	55.1±9.1	< 0.001
Total leucocytic . Count(mm3/ L)	12.53 ± 1.1	14.14 ±8.1	> 0.05	12.26 ± 5.6	> 0.05
Absolute band count (mm3/ L)	96.1±0.3	93.03±5.6	< 0.01	35.25±10.85	< 0.001
C- reactive protein mg/L	4.6± 0.8	27.8±30.03	<0.001	34.43±35.6	< 0.001

Table (7) and figures(7,8,9) show there are statistically difference between control group and critically ill patients on admission and day 3 regarding mean total serum zinc, CRP and band count (P < 0.001) while no statistically difference was found between them regarding TLC (P > 0.05).

Table (8): Mean total serum zinc (ug %) in relation to outcome.

Mean total serum zinc (ug %)	control group No = 20	Survivors No = 36	P. VS control	Non survivors No = 4	P vs control
On admission Mean ± SD	89 ±3.1	52.4±5.4	P1< 0.001	49±3.1	< 0.01
At 3rd day Mean ± SD	-	57±8.8	P2< 0.001	46±2.4	< 0.01

P value between survivors and non survivors is < 0.01 on admission and 3 days later.

Table (8) and figure (10) show: mean total serum zinc in relation to outcome. There is a highly statistically significant difference in mean total serum zinc between survivors and the control group on admission as well as day 3 after admission (P< 0.01). The same result was found between the non survivors and the control group (P< 0.01). There was also a statistically significant difference between survivors and non survivors on admission and day 3 after admission (P< 0.01).

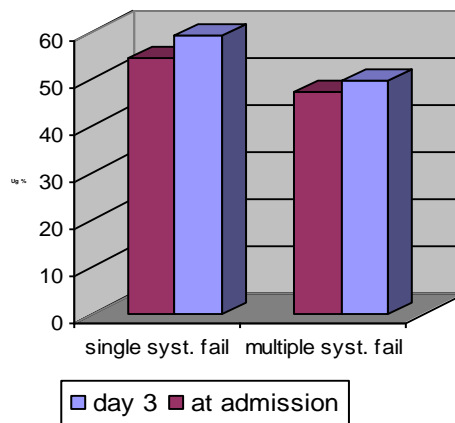Figure (6) Mean of S. Zinc among patients under sutdy according to number of system failure

Figure (7) Mean of TLC among control group and cases at admission and day 3
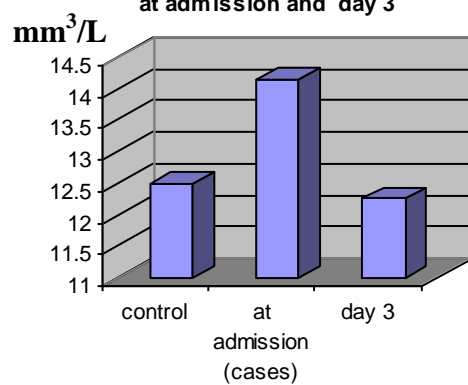
mm^3/L

Figure (8) Mean of absolut band count among control group and cases on admission and day 3
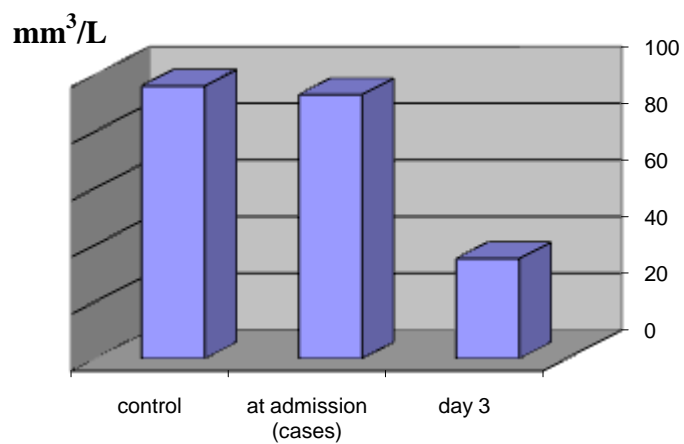
mm^3/L

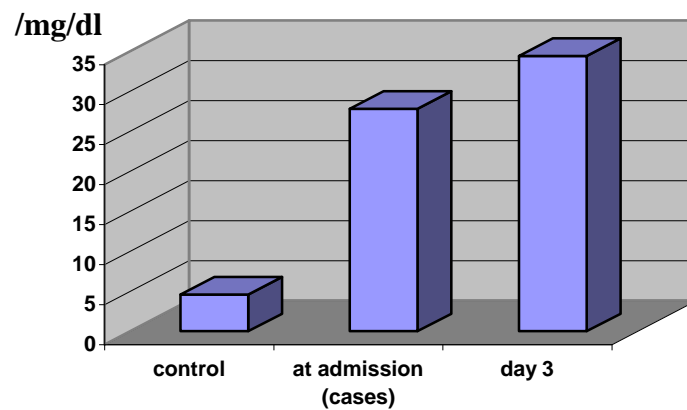**figure (9) Mean of C-reactive protein among control group and cases on admission and day 3**

figure (10) Mean of serum Zinc in relation to outcom