

RESULTS

Table (1): Number and percent distribution of infectious diseases admitted to Benha fever hospital (October 1988-September 1989).

Disease	No.	%
Meningitis	659	13.0
Viral hepatitis	328	6.5
Measles	178	3.5
Pneumonia	104	2
Tetanus neonatorum	95	1.9
Typhoid	82	1.6
Tetanus (general)	48	0.9
Peurperal sepsis	23	0.5
Mumps	16	0.3
Eryspeals	11	0.2
Others	3523	69.6
Total	5057	100

(Others include, fevers for investigations, Common Cold, Influenza, Sore Throat, Bronchial Asthma, Chiken Pox, Malaria and Diphteria).

This table reveals that the highest percentage of admitted cases were meningitis (13%), viral hepatitis, (6.5%), Measles (3.5%) then pneumonia (2%) and tetanus neonatorum (1.9%).

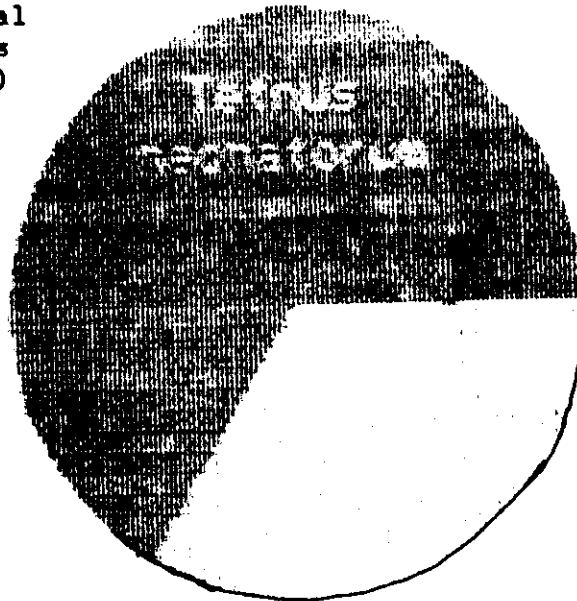
Table (2): Number and percent distribution of different types of tetanus cases admitted to Benha fever hospital during (October 1988-September 1989).

Type of Tetanus	Cases		Deaths		Case fatality rate
	No.	%	No.	%	
Tetanus neonatorum	95	66.4	51	94.4	53.7%
Other cases of tetanus (general and surgical).	48	33.6	3	5.6	6.3%
Total	143	100	54	100	37.6%

Table (2) and pie chart (1) show that out of (143) tetanus cases admitted to hospital during (Oct. 1988-Sept. 1989), 95 (66.4%) cases were tetanus neonatorum with case fatality rate 53.7 %.

Pie chart (1)

Neonatal
tetanus
(66.4%)



Other
cases of
tetanus
(33.6%)

Distribution of tetanus cases admitted to Benha fever hospital (Oct. 1988-Sep. 1989).

Table (3): Incidence rate of tetanus neonatorum cases admitted to Benha fever hospital during (October 1988-September 1989).

* Live births	Tetanus neonatorum cases	Incidence rate
15877	95	6 %

* Benha Local Health Authority (1990).

This table shows that the incidence rate of tetanus neonatorum cases was 6 % .

Table (4): Number and percent distribution of tetanus neonatorum diseases according to neonatal deaths during (October 1988- September 1989).

* Neonatal deaths	Tetanus neonatorum deaths	
	No.	%
934	51	5.4

* Benha Local Health Authority (1990).

This table indicates that neonatal tetanus deaths comprises 5.4 % of neonatal deaths.

Table (5): Incidence rate of tetanus neonatorum cases that admitted to Benha fever hospital during the last five years (1985-1989).

Year	Number of live births	Tetanus neonatorum cases	Incidence rate
1985	23048	241	10.5%
1986	24734	187	9%
1987	16787	173	10.3%
1988	17199	165	9.6%
1989	15444	55	3.6%

** Benha local health authority (1985-1990).

Table (5) and chart (2) reveal that there is a decline in the incidence rate of admitted cases of tetanus nonatorum from 10.5% to 3.6% by the years 1985 and 1989 respectively.

Chart (2)

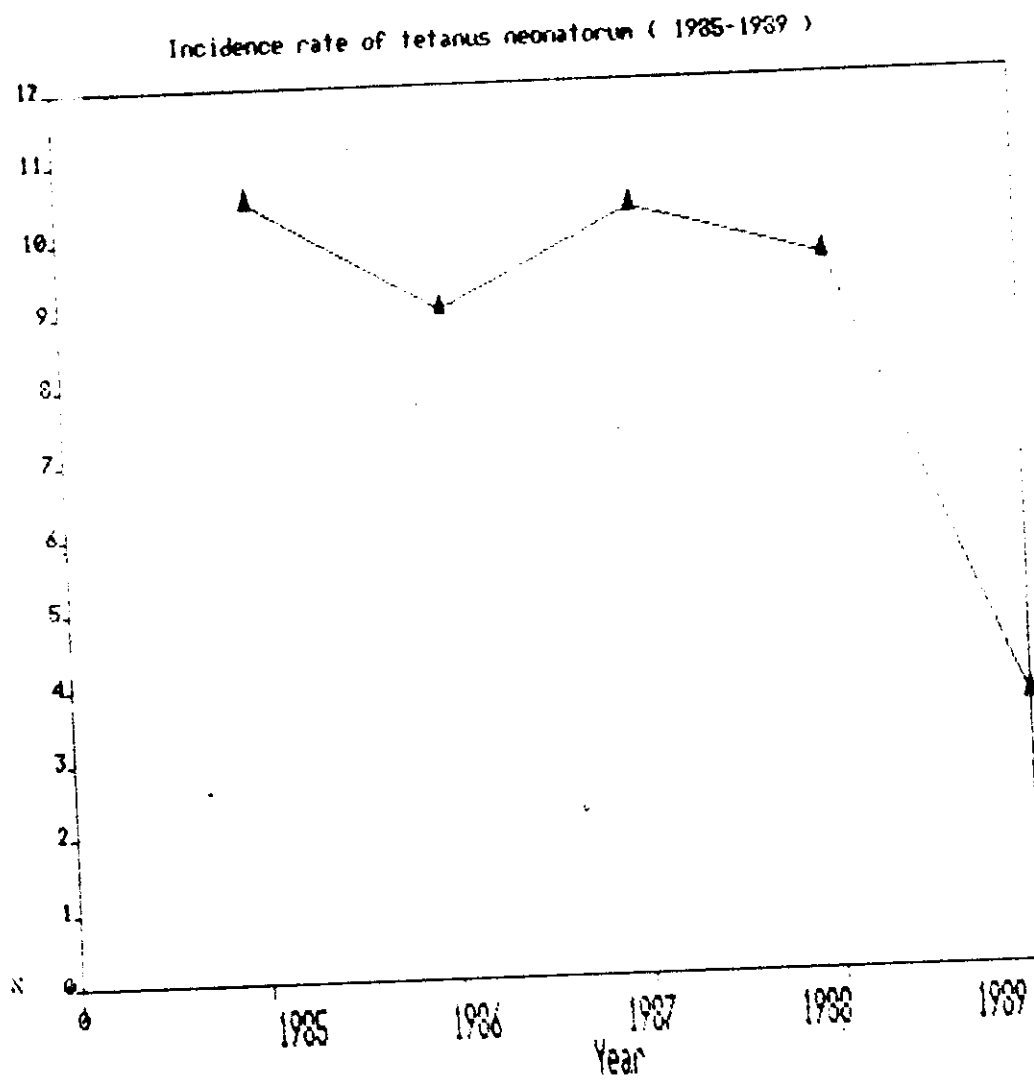


Table (6): Monthly distribution of tetanus neonatorum cases during (October 1988-September 1989)

Month	Tetanus neonatorum cases	
	No.	%
October	15	15.8
November	21	22.1
December	17	17.9
January	6	6.3
Feberuary	5	5.3
March	4	4.2
April	4	4.2
May	3	3.1
June	0	0
July	5	5.3
August	9	9.5
September	6	6.3
Total	95	100

Table (6) and chart (3) reveal that the highest percentages of tetanus neonatorum cases were (22.1%), (17.9%) and 15.8% during November, December and October respectively, while during June 1989 it was declined to zero percent.

Chart (3)

Monthly distribution of T.M. cases(10/1988-9/1989)

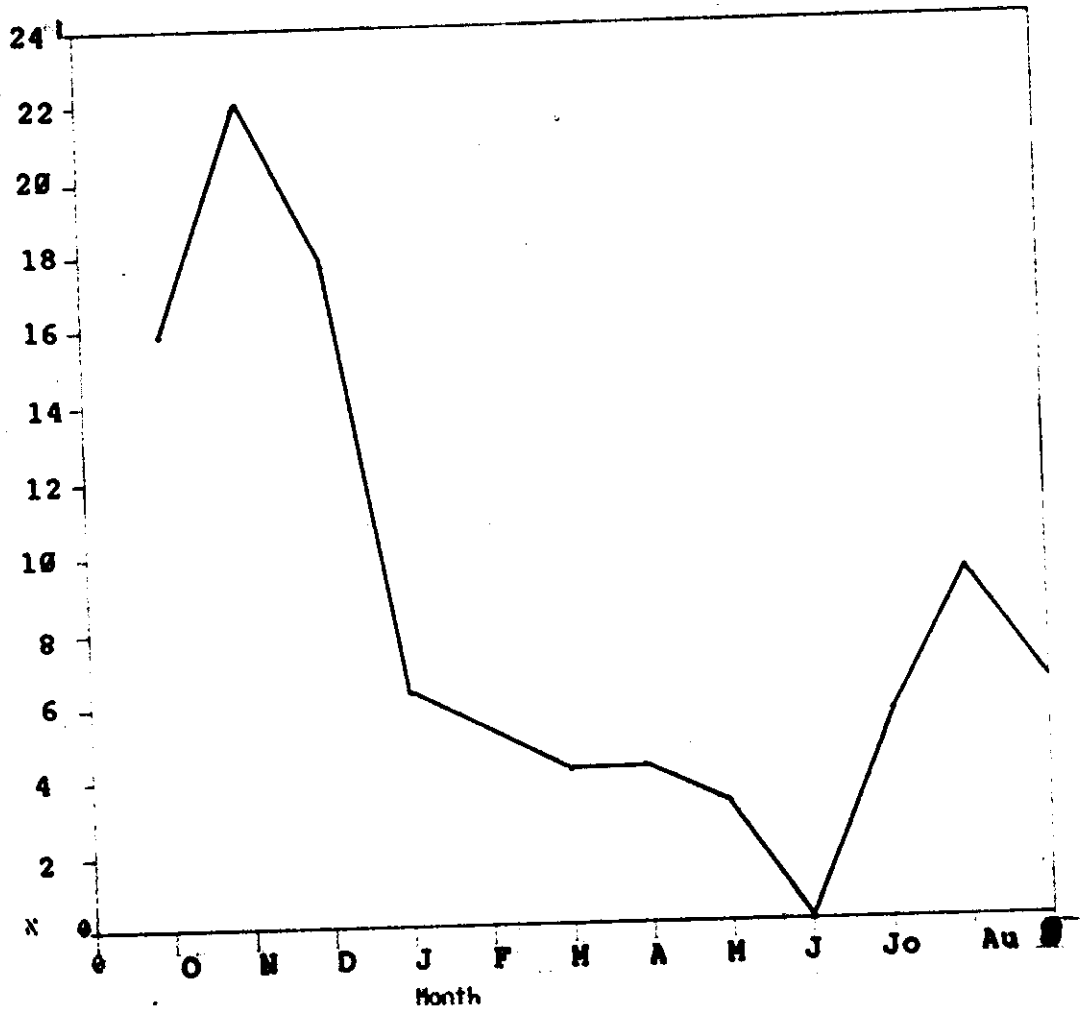


Table (7): Number and percent distribution of tetanus neonatorum cases according to age on admission to the hospital.

Age of infants on admissions in days	cases	
	No.	%
< 3	3	3.2
3-	6	6.3
6-	13	13.7
9-	39	41
12+	34	35.8
Total	95	100

Table (7) and chart (4) illustrate that 64.2% of tetanus neonatorum cases were less than 12 days of age at admission.

Chart (4)

Distribution of T.N. cases accord. to admission age

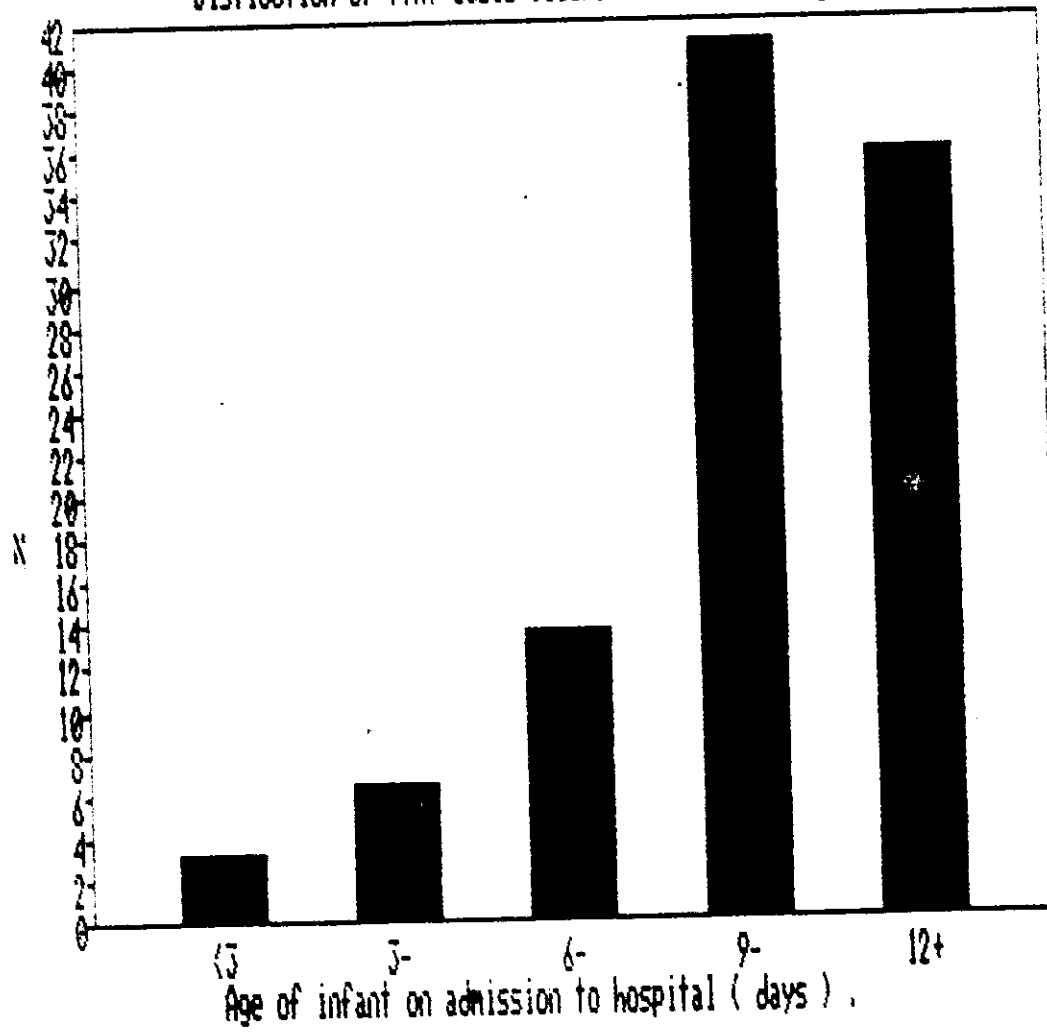


Table (8): Prognosis of tetanus neonatorum according to age on admission to hospital.

Age on admission in days	Prognosis				Total	
	Cured		died		No.	%
	No.	%	No.	%		
< 9	6	27.3	16	72.7	22	100
9-	11	28.2	28	71.8	39	100
12+	27	79.4	7	20.6	34	100
Total	44	46.3	51	53.7	95	100

$$\chi^2 = 23.1 \quad P < 0.05$$

This table illustrates that the fatality of the disease was 72.7 % among infant with age < 9 days, while it was 20.6% when the age of infants on admission were 12+ days. This difference is statistically significant.

Table (9): Number and percent distribution of tetanus neonatorum cases and deaths according to sex.

Tetanus neonatorum	Sex				Total		Z
	male		female		No.	%	
	No.	%	No.	%			
- Cases	72	75.8	23	24.2	95	100	5.03
- Deaths	38	74.5	13	25.5	51	100	3.50
- Case fatality rate		52.8%		56.5%		53.7%	

$p < 0.05$

Table (9) and chart (5) reveal that the morbidity of tetanus neonatorum was more common among males than females, they were 75.8% and 24.2% respectively and this difference is statistically significant.

Chart (5)

Morbidity and mortality of T.N. according to sex .

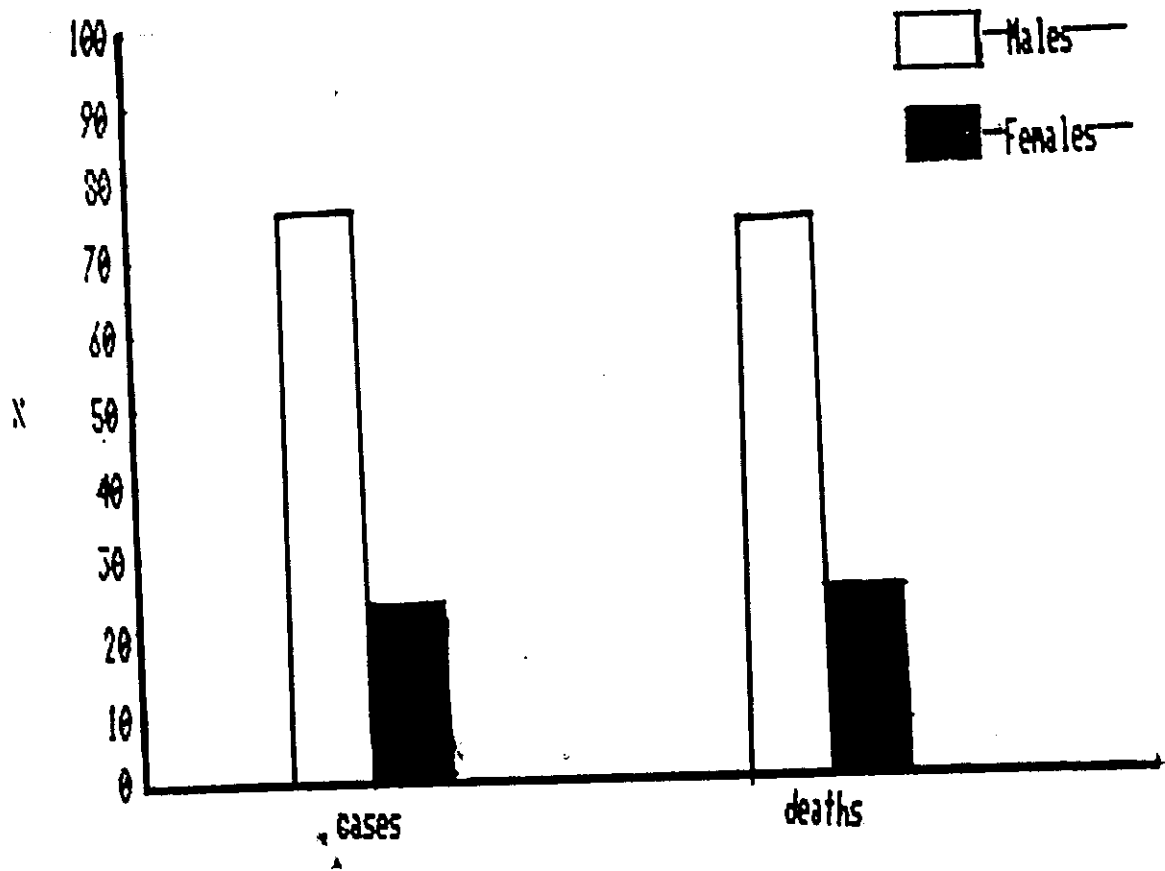


Table (10): Number and percent distribution of tetanus neonatorum cases and deaths according to residence.

Tetanus neonatorum	residence				Total		Z
	urban		rural		No.	%	
	No.	%	No.	%			
- Cases	13	13.7	82	86.3	95	100	7.08
- Deaths	6	11.8	45	88.2	51	100	5.46
- Case fatality rate		46.2%		54.9%		53.7%	

$P < 0.05$

This table indicates that (86.3%) of cases were rural infants with case fatality rate 54.9%. Also, (13.7%) of cases were urban infants with case fatality rate 46.2%.

Table (11): Effect of presence of animals shed inside house (Hosing condition) on morbidity and mortality of tetanus neonatorum.

neonatorum.

Tetanus neonatorum	Animal shed				Total		Z
	Present		Absent				
	No.	%	No.	%	No.	%	
Cases	76	80	19	20	19	100	5.85
Deaths	44	86.3	7	13.7	7	100	5.18
Case fata- lity rate	57.9%		36.8%		53.8%		

$p < 0.05$

This table reveals that 80% of cases with animal shed inside their houses, while only 20% of cases the animal shed is absent. This difference is statistically significant. The case fatality rate was higher (57.9%) in the presence of animal shed inside houses while it was 36.8% in absence of animal shed.

Table (12): Effect of (floor status of house) housing condition on morbidity and mortality of tetanus neonatorum.

Tetanus neonatorum	floor of house				Total		Z
	earthen		cement		No.	%	
	No.	%	No.	%			
- Cases	77	81.1	18	18.9	95	100	6.05
- Deaths	46	90.2	5	9.8	51	100	5.74
- Case fatality rate		59.7%		27.8%		53.7%	

$p < 0.05$

This table shows that the highest percentage of the cases was 81.1% with earthen floor of house while it was 18.9% with cement floor. This difference is statistically significant.

Table (13): Number and percent distribution of tetanus neonatorum cases and deaths according to social standard of families.

Tetanus neonatorum	Social standard						Total	
	Low		Middle		High		No.	%
	No.	%	No.	%	No.	%		
Cases	62	65.3	21	22.1	12	12.6	95	100
Deaths	40	78.4	8	15.7	3	5.9	51	100
Case fatality rate	64.5%		38.1%		25%		53.7%	

Social scoring according to (Fahmy and El- Sherbini, 1983)

This table reveals that the highest percentage of cases (65.3%) were born to low social standard families. Also, the case fatality rate of the disease was higher among this group (64.5%).

Table (14): Number and percent distribution of tetanus neonatorum cases and deaths according to parents education.

Tetanus neonatorum	Mother education				Father education				Total cases and deaths	
	Illiterate		read and write and more.		Illiterate		read and write and more.			
	No	%	No	%	No	%	No	%	No	%
	Cases	82	86.3	13	13.7	41	43.2	54	56.8	95
Deaths	48	94.1	3	5.9	25	49	26	51	51	100
Case fatality rate	58.5%		23.1%		61%		48.2%		53.7%	

* More includes Basic, secondary and University education.

This table shows that illiterate mothers and fathers were 86.3% and 43.2% with case fatality rate 58.5% and 61% among both groups respectively.

Table (15) : Number and percent distribution of tetanus neonatorum cases and deaths according to parents occupations.

Tetanus neonatorum	mothers occupation				Fathers occupation				Total cases and deaths	
	house wife		employed		Farmers & manual- workers		Professio- nal		No	%
	No	%	No	%	No	%	No	%		
Cases	98	94.7	5	5.3	69	72.6	26	27.4	95	100
Deaths	49	96.1	2	3.9	41	80.4	10	19.6	51	100
Case fata- lity rate	54.4%		40 %		59.4%		38.5%		53.7%	

This table indicates that, (94.7%) of cases the mothers were housewives and (72.6%) of cases the fathers were farmers and manual workers. The case fatality rates among both groups were 54.4% and 59.4% respectively.

Table (16) : Number and percent distribution of tetanus neonatorum cases and deaths according to mother age.

Mother age	tetanus neonatorum cases		died cases		case fatality rate
	No	%	No	%	
< 25	16	16.8	7	13.7	43.8%
25-	23	24.2	11	21.6	47.8%
30-	24	25.2	12	23.5	50%
35+	32	33.7	21	41.2	65.6%
Total	95	100	51	100	53.7%

This table shows that (58.9%) of cases the age of their mothers was 30 + years. Also, the case fatality rate of the disease was higher (65.6%) among infants of mothers with age 35 + years.

Table (17): Number and percent distribution of tetanus neonatorum cases and deaths according maternal parity.

parity.							
Tetanus neonatorum	maternal parity				Total		Z
	primipara		multipara		No.	%	
	No.	%	No.	%			
- Cases	9	9.5	86	90.5	95	100	7.93
- Deaths	4	7.8	47	92.2	51	100	6.02
- Case fatality rate		44.4%		54.7%		53.7%	

$p < 0.05$

This table illustrates that the percentage of cases among the multiparous and primipara mothers was 90.5% and 9.5% respectively. This difference is statistically significant. Also, the case fatality rate among cases of multiparous mothers was 54.7%.

Table (18): Number and percent distribution of tetanus neonatorum cases and deaths according to attendance regularity of mothers seeking antenatal care.

Tetanus neonatorum	Attendance for antenatal care						Total	
	regular		irregular		absent		No.	%
	No.	%	No.	%	No.	%		
Cases	10	10.5	23	24.2	62	65.3	95	100
Deaths	3	5.9	9	17.6	39	76.5	51	100
Case fatality rate	30%		39.8%		62.9%		53.7%	

This table illustrates that the percentage of cases was 65.3 % among infants of mothers without antenatal care. On other hand it was 10.5% among infants of mothers with regular attendance for antenatal care.

Table (19): Prognosis of tetanus neonatorum cases according to antenatal care.

Antenatal care	Prognosis				Total	
	cured		died		No.	%
	No.	%	No.	%		
- Absent	23	37.1	39	62.9	62	100
- Present	21	63.6	12	36.4	33	100
Total	44	46.3%	51	53.7%	95	100

$$\chi^2 = 9.91$$

$$P < 0.05$$

This table shows that the cure rates were 63.6% and 37.1% among cases of mothers who received antenatal care and those of mothers without antenatal care respectively. This difference is statistically significant.

Table (20) : Number and percent distribution of cases and deaths of tetanus neonatorum according to vaccination of their mothers.

Tetanus neonatorum	Mothers vaccination				Total		Z
	vaccinated		non vaccination				
	No	%	No	%	No	%	
Cases	30	31.6	65	68.4	95	100	3.6
Deaths	11	21.6	40	78.4	51	100	4.05
Case fatality rate	36.7%		61.5%		53.7%		

$P < 0.05$

This table illustrates that (68.4%) of tetanus neonatorum cases, infants of non vaccinated mothers and (31.6%) of cases infants of vaccinated mothers. This difference is statistically significant. Also, the case fatality rate was 61.5% among cases of non vaccinated mothers.

Table (21): Prognosis of tetanus neonatorum cases according to vaccination status of mothers.

Tetanus toxoid doses	prognosis				Total	
	cured		died		No.	%
	No.	%	No.	%		
No vaccination	25	38.5	40	61.5	65	100
Vaccination: one dose	12	54.5	10	45.5	22	100
Two doses	7	87.5	1	12.5	8	100
Total	44	46.3	51	53.7	95	100

This table reveals that the percentage of cured cases (38.5%) among infants of non vaccinated mothers and it was 54.5% and 87.5% among infants of vaccinated mothers by one and two doses respectively.

Table (22): Prognosis of tetanus neonatorum cases according to time of vaccination of their mothers before labour.

Time of vaccination per weeks	Prognosis				Total	
	cured		died		No.	%
	No.	%	No.	%		
4-	5	45.5	6	54.5	11	100
6+	14	73.7	5	26.3	19	100
Total	19	63.3	11	30.7	30	100

Adjusted $\chi^2 = 2.4$

$P > 0.05$

This table shows that mothers which received vaccination 6+ weeks before labour the percentage of cure of their infants was 73.7% while those which received the vaccine less than 6 weeks this percentage was 45.5%. This difference is not statistically significant.

Table (23): Number and percent ditribution of tetanus neonatorum cases and deaths according to place of labour.

Tetanus neonatorum	Place of labour				Total	
	hospital+ private- clinic		home			
	No.	%	No.	%	No.	%
	- Cases	5	5.2	90	94.8	95
- Deaths	1	2.3	50	97.7	51	100
- Case fatali- ty rate	20%		55.6%		53.7%	

This table reveals that 94.8% of tetanus neonatorum cases were delivered at home while 5.2% of cases were delivered at hospital. Also the case fatality rate was higher among cases that delivered at home (55.6%).

Table (24): Number and percent distribution of tetanus neonatorum cases and deaths according to personnel who performed the delivery.

Personnel	Cases		Deaths		Case fatality rate
	No.	%	No.	%	
Doctors	6	6.3	1	2	16.7%
Midwives	13	13.7	4	7.8	30.8%
Dayas	76	80	46	90.2	60.5%
Total	95	100	51	100	53.7%

This table reveals that 76 cases (80%) of tetanus neonatorum were delivered by Dayas with case fatality rate among this group (60.5%) while the case fatality rates among cases those delivered by doctors and midwives were 16.7% and 30.8% respectively.

Table (25): Prognosis of tetanus neonatorum cases according to medical supervision during labour.

Natal medical supervision	prognosis				Total	
	cured		died		No.	%
	No.	%	No.	%		
- Medical supervision	14	73.7	5	26.3	19	100
- Non	30	39.5	46	60.5	76	100
Total	44	46.3	51	53.7	95	100

Adjusted $\chi^2 = 7.15$

$P < 0.05$

This table illustrates that out of 76 cases who don't received medical supervision during labour 46 cases (60.5%) died while only 5 cases (26.3%) of those who received medical supervision during labour died. This difference is statistically significant.

Table (26): Number and percent distribution of tetanus neonatorum cases and deaths according to instruments used for cutting the umbilical cord.

Tetanus neonatorum	instruments used						Total	
	Knife		Razor		Scissor		No.	%
	No.	%	No.	%	No.	%		
Cases	17	17.9	38	40	40	42.1	95	100
Deaths	12	23.5	23	45.1	16	31.4	51	100
Case fatality rate		70.6%		60.5%		40%		53.7%

This table reveals that an observed difference in the case fatality rate between different instruments used for cutting the cord, it was 70.6%, 60.5% and 40% with knife, razor and scissors respectively.

Table (27): Number and percent distribution of tetanus neonatorum cases and deaths according to disinfection of the cutting instruments by boiling.

Tetanus neonatorum	Boiling of instruments				Total		Z
	boiled		non boiled		No.	%	
	No.	%	No.	%			
- Cases	32	33.7	63	66.3	95	100	3.18
- Deaths	12	23.5	39	76.5	51	100	3.78
- Case fatality rate	37.5%		61.9%		53.7%		

$P < 0.05$

This table indicates that the umbilical cord of 66.3% of the cases were cut by non boiling instruments with case fatality rate 61.9%.

Table (28): Number and percent distribution of tetanus neonatorum cases and deaths according to dressing of the umbilical stump.

Tetanus neonatorum	dressing of the stump				Total	
	non dressing		non sterili- zed dressing			
	No.	%	No.	%	No.	%
Cases	71	74.7	24	25.3	95	100
Deaths	40	78.4	10	21.6	51	100
Case fatality rate	56.3%		41.7%		53.7%	

This table illustrates that the umbilical stump of 74.7% of tetanus neonatorum cases were without dressing with case fatality rate 56.3% and 25.3% of cases with unsterilized dressing for the umbilical stump with case fatality rate 41.7%.

Table (29): Prognosis of tetanus neonatorum cases according to use of disinfectant for the umbilical stump.

Umbilical stump disinfectant	prognosis				Total	
	cured		died		No.	%
	No.	%	No.	%		
- Disinfectant using (Alcohol Tr.iodine others)	24	75	8	25	32	100
- Non	20	31.7	43	68.3	63	100
Total	44	46.3	51	53.7	95	100

$$\chi^2 = 15.96 \quad P < 0.05$$

This table reveals that the cure rate of tetanus neonatorum cases was 75% when disinfectant used for the umbilical stump while it was 31.7% when disinfectant not used. This difference is statistically significant.

Table (30): Prognosis of tetanus neonatorum cases according to umbilical stump status.

Umbilical stump status	Prognosis				Total	
	cured		died		No.	%
	No.	%	No.	%		
Sepsis	9	19.6	37	80.4	46	100
No sepsis	35	71.4	14	28.6	49	100
Total	44	46.3	51	53.7	95	100

$$\chi^2 = 25.67$$

$$P < 0.05$$

This table shows statistically significant difference between prognosis of cases without umbilical stump sepsis (71.4% cured) and those with sepsis (19.6% cured).

Table (31): List of clinical manifestations among cases
(n= 95).

Clinical manifestations	Tetanus neonatorum cases	
	No	%
Suckling affection	89	93.7
Presence of lock Jaw	83	87.4
Presence of Convulsions	68	71.6
Presence of risus sardonicus	57	60
Umbilical stump sepsis	41	43.2
Pyrexia	61	64.2

Table (31) and figures (3,4) indicate that the most frequent clinical manifestations were Suckling affection (93.7%), Lock Jow (87.4%) and Convulsions (71.6%).



Fig. (3): Indicates that the prominent signs are convulsions and umbilical sepsis.



Fig. (4): Indicates that, the most prominent signs of the disease are Convulsions, Lock Jaw, Risus Sardonicus and Umbilical Sepsis.

Table (32): Prognosis of tetanus neonatorum according to duration of signs and symptoms before admission to the hospital.

Duration of signs and symptoms before admission	Prognosis				Total	
	cured		died		No.	%
	No.	%	No.	%		
2	15	34.9	28	65.1	43	100
3	12	41.4	17	58.6	29	100
4+	17	73.9	6	26.1	23	100
Total	44	46.3	51	53.7	95	100

$$\chi^2 = 9.6$$

$$P < 0.05$$

This table indicates that the cure rate was 73.9% when the duration of symptoms is 4+ days before admission to the hospital while it was 34.9% when it was 2 days. This difference is statistically significant.

Table (33): Number and percent distribution of possible causes of death from tetanus neonatorum according to hospital records.

Possible cause of death	Deaths	
	No.	%
Asphyxia (Respiratory spasm)	24	47.1
Hyperpyrexia	10	19.6
Pulmonary oedema	8	15.7
Bronchopneumonia	5	9.8
Gastro-enteritides	4	7.8
Total	51	100

This table illustrates that, 82.4% of deaths were due to respiratory spasm (asphyxia), hyperpyrexia and pulmonary oedema.

Table (34): Duration of hospital stay before death from tetanus neonatorum .

Hospital stay duration	Deaths	
	No.	%
1 day	32	62.8
2 days	14	27.5
3 days	4	7.8
4 days	1	1.9
Total	51	100

Table (34) and chart (6) illustrate that, 90.3% of deaths occurred within 2 days after admission.

Chart (6)

