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NEONATAL TETANUS IN THE BAGHDAD AREA: EPIDEMIOGICAL STUDY

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الكزاز الولادي في منطقة بغداد - دراسة وبائية

الخلاصة :

ان مرض الكزاز الولادي لا يزال شائعاً في منطقة بغداد، ومن خلال دراسة الحالات التي ادخلت في مستشفى ابن الخطيب في بغداد خلال فترة خمس سنوات (١٩٨٠ - ١٩٨٤) تبين ان ٢ر٤٪ من مجموع حالات الامراض المعدية التي ادخلت المستشفى خلال نفس الفترة هي حالات الكزاز الولادي .

لقد لوحظ ان عدد حالات الذكور من كزاز حديثي الولادة الذين رقدوا المستشفى كانت اكثر من عددها في الاناث حيث كانت نسبة الذكور الى الاناث كنسبة ٢ر٨ الى واحد .

ان فصلي الخريف والشتاء من كل سنة اضهرت زيادة معنوية في عدد حالات كزاز حديثي الولادة عن فصول السنة (القيمة المعنوية اقل من ٠ر٠١ واغلبيت الحالات (٦٧ر٨٪) كانت من المناطق الريفية . ان ٢ر٩٨٪ من مجموع الحالات كانت لاطفال تمت عملية ولادتهم في البيت . اما نسبة الوفيات العامة للمرض كانت ٧٦ر٨٪ :

لقد حدث انخفاض ملموس في عدد الحالات التي ادخلت الى المستشفى خلال السنتين التي اعقبت تنفيذ برنامج التلقيح الشامل في القطر والذي بدأ في الاول من ايلول عام ١٩٨٥ .

SUMMARY:

Neonatal tetanus is still prevalent in the Baghdad area, as seen from the number of cases admitted to Ibn El-Khateeb Hospital, Baghdad, over a five year period (1980-1984) (4.2% of the total admitted cases for other infectious diseases).

The number of admitted males was significantly higher than females. Male/female ratio was 2.8:1.

Autumn and Winter showed a significantly higher number of admitted cases (P< 0.01).

The majority of patients (67.8%) were from the rural area, and 98.4% of the total number were delivered at home. Total case fatality rate was 76.8%. A steep decline, in the number of admitted cases per year, took place in the 2 years which followed the application of the Expanded Programme of Immunization (EPI) on the 1st. of September, 1985.

INTRODUCTION:

Neonatal tetanus (N.T.) is a severe and highly fatal clinical type of tetanus[1]. It still constitutes a major health problem in developing countries and an improtant cause of mortality in the

neonatal period" [3]

In Iraq, N.T. is still prevalent as appears from hospital records and considered a serious health problem that made the Public Health Authorities to include vaccination of pregnant women in the Expanded Program of Immunization (EPI-Iraq).

The purpose of this study is to bring to light the epidemiological pattern of N.T. in Baghdad area through the cases admitted to Ibn-El-Khateeb Hospital, Baghdad (I.K.H.B.) over a 5 year period (1980-1984) and to evaluate the impact of the EPI on admission rate two years after the beginning of the program on the 1st. September, 1985.

MATERIALS AND METHODS:

Hospital records of 1043 cases of N.T. admitted to I.K.H.B. over a 5 years period (1st. Jan., 1980 - 31st. Dec., 1984) were studied. The diagnosis was established on clinical grounds: inability to suck, tonic contraction of muscles and spasmodic fits. Case records that did not fulfill these criteria were discarded.

These 1043 cases were studied regarding admission rate per year and season and month, age, sex, place of delivery, place of residence and case fatality rate. Patients discharged from the hospital on family request before cure, were excluded from the study of case fatality rate.

Another 210 cases, being admitted in the two years which followed the beginning of the EPI on the 1st. Sep., 1985 were compared as admission rate per year with those 1043 admitted prior to the start of the program. Chi square test was applied to determine the statistical significance of differences.

RESULTS:

The total number of cases of all infectious diseases admitted to I.K.H.B. over a 5 year period (1980-1984) was 24738 cases. Tetanus was the cause in 1226 cases (5%), out of which 1043 had N.T. (85.1%). No significant difference was found among yearly admission in this period ($P > 0.01$) (Table 1). Male/female ratio was 2.8:1 for N.T., 1.5:1 for non-N.T. and 1.7:1 for the total admission of all in-

Table 1. Number of admissions of all infectious diseases, total tetanus cases and neonatal tetanus to Ibn El-Khateeb - Hospital - Baghdad 1980-1984.

years	Total No. of admitted infectious diseases cases	tetanus			neonatal tetanus		
		total No. of cases.	% of cases in all admissions	No. of cases	% of in all admissions	cases in total tetanus cases
1980	5135	274	5.2	229	4.5	83.6
1981	4419	196	4.4	165	3.7	84.2
1982	4604	265	5.8	222	4.8	83.7
1983	4782	216	4.5	187	3.9	86.6
1984	5798	275	4.7	240	4.1	87.3
total	24738	1226	5.0	1043	4.2	85.1

fectious diseases (Table 2).

N.T. incidence showed seasonal variation. The number of cases was lowest in the hottest part of the year, from May to September, started to increase in October and to peak in November - January. Autumn and Winter were seasons of significantly higher admission ($P < 0.01$) (Fig. 1). Only 15 patients (1.4%) were in −3 days age group, and 294 cases (28.8%) in the 10-30 days age group. The majority of 734 cases (70.4%) were in the 4-9 days age group, the peak was in the 7th. day and the mean age on admission was 8.7 days (Table 3) Most of the patients 1027 (98.4%) were delivered at home and only 16 (1.6%) at hospital. The majority of them were from rural areas while the remainder 338 cases (32.4%) were from urban and suburban areas. Only 199 patients (19.1%) were cured, 660 patients (63.3%) died and 184 (17.6%) were discharged on family request.

The total case fatality rate was 76.8% (Table 4). Most of the newborns died between the 6th. and 10th. day of age. The mean was 9.9 days and the peak of deaths was on the 8th. day of life. (Fig. 2).

The number of cases admitted in the first year after the beginning of the EPI was 130 cases and was 80 in the second year (Fig. 3).

DISCUSSION:

The number of N.T. cases admitted in 5 years (1043) is a considerable one and especially when we know that it dose not reflect the real morbidity in the Baghdad area. N.T. is one of the most underreported comunicable disease[4].

Table 2. Number and percentages of total admissions, neonatal and non-neonatal tetanus cases to IBN EL-Khateeb Hospital, Baghdad, 1980-1984.

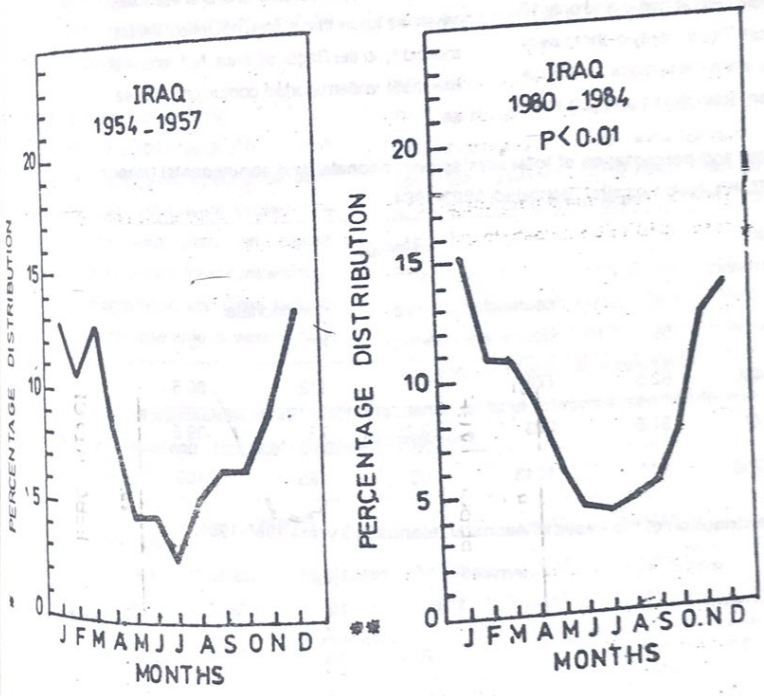
sex	total admission		tetanus			
			neonatal		non-neonatal	
	No.	%	No.	%	No.	%
Males	15466	62.5	770	73.8	112	60.5
Females	9272	37.5	273	26.2	73	39.5
total	24738	100	1043	100	185	100

Table 3. Age distribution of the cases of neonatal tetanus in 5 years 1980-1984.

age groups in days	males		females		total	
	No.	%	No.	%	No	%
-3	10	1.3	5	1.8	15	1.4
4-9	542	70.3	192	70.0	734	70.4
10-30	218	28.4	76	28.2	294	28.2
total	770	100	273	100	1043	100

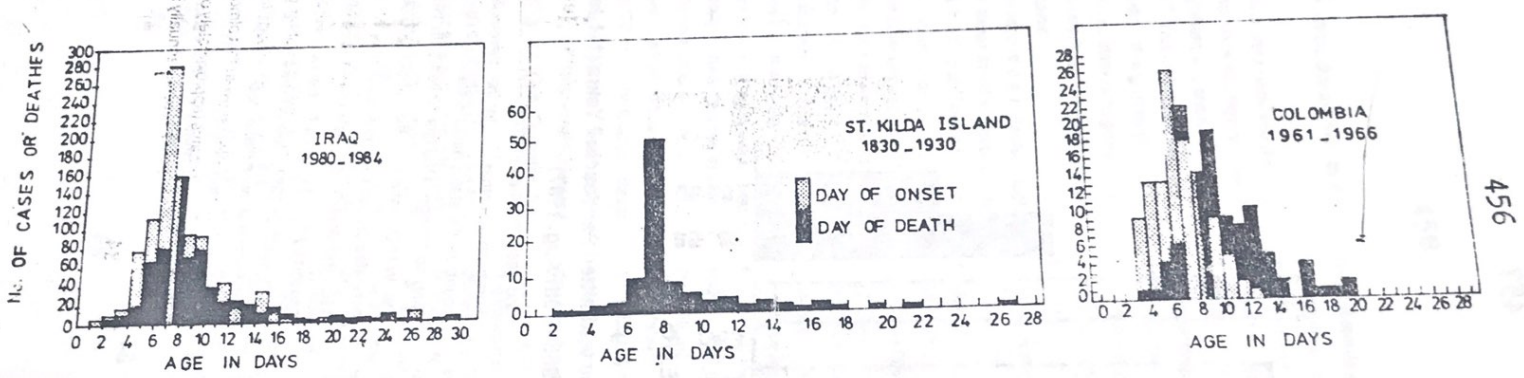
Table 4. Total case fatality rate (C.F.R.) & Per age groups, of neonatal tetanus cases admitted in 5 years.

age groups in days	No. of admitted	No. of deathes	C.F.R. %
[illegible]	10	9	90.0
4-9	634	562	88.6
10-30	215	89	41.3
total	859	660	76



* CRITCHLY A.M. ** PRESENT STUDY.

Fig. 1
Percentage Distribution Per Month of Neonatal Tetanus Cases in Iraq.



* ADMISSION ≙ ONSET

Fig. 2

Number of Neonatal Tetanus Cases, By Day of Admission* and Day of Death, in Iraq, ST. Kilda Island and Colombia.

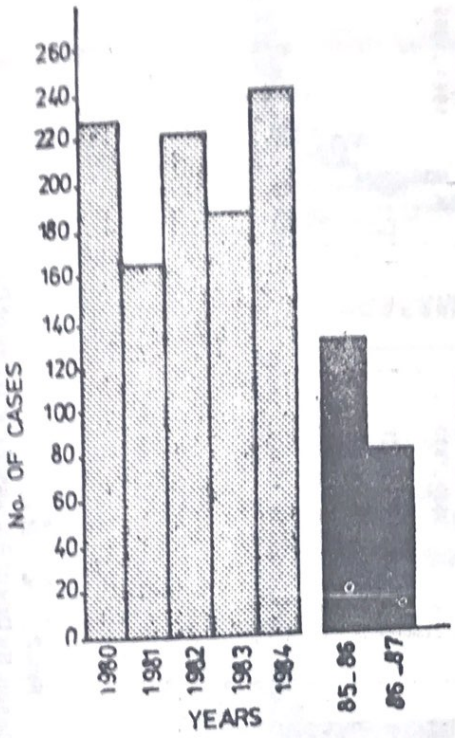


Fig.3

No. of Cases With Neonatal Tetanus Admitted Per Year in 7 Years (1st Jan. 1980 - 31st Dec. 1984) (1st Sep. 1985 - 30th Aug. 1987).

The prevalence of N.T. in Iraq is not fully studied. The median annual incidence of tetanus in Iraq over a 5 year period (1980-1984) was 93[5]. Data on the reported N.T. in the Iraqi Ministry of Health in the years 1980-1984 showed an average of 791 cases[6]. In 1985 the number of N.T. reported was still high (630), but in 1986 it was only 197[6].

The prevalence of N.T. and its losses differs completely in the two worlds. In the developed countries like U.S.A., U.K., Scandinavia and others, N.T. became a rare condition, and was completely irradicated in 30% of the European countries[1,2,7]. In the developing countries, the status remains stationary, showing no change in the last 10 years. In 1978 the W.H.O. estimated that about 900,000 neonates die per year as a result of N.T.[8]. In 1984 the W.H.O. also estimated the deaths caused by N.T. to be not far below a million every year[9]. In 1987, reports from South East Asia Region showed that almost one half million of deaths (approximately one every minute) due to N.T. occur annually in this region[10]

The condition in Africa doesn't look to be much better[3].

Seasonal variations were observed (Fig. 1). Autumn and Winter showed a high number of cases. A similar pattern was observed in Mosul[11] and Basrah[12]. This looks to be the general seasonal variation, though might be due to even more defective state of hygiene in the cold season, still needs further epidemiological studies to explain.

The male/female ratio of 2.8:1 (Table 2) look to be similar to those in other parts of the country. It was 3:1 in Basrah[12] and 4.6:1 in rural areas and 3:1 in urban areas of Neneved governorate[11]. In other developing countries, male/female ratio has also a similar pattern. It is 1.4:1 in Sudan, 2.6:1 in Egypt, 3.7:1 in India[11] and 3:1 in Indonasia[1]. This ratio can be explained by the fact that in the developing countries, males are more highly valued than females especially in rural families in which the number of female children predominates.

The high number of admitted cases in the 4-9 days age group (70.4% of the total), is related to the incubation period of N.T. which is between 5 and 10 days[1,2]. This pattern is shared by other countries like India, Colombia, Sudan and others[4].

The vast majority of patients (1027, 98.4%) were delivered at home and this may be partly due to relatively insufficient number of maternal care units in rural areas and traditional refusal of pregnant women to deliver at hospitals in such areas.

Cases from rural areas were 705 (67.8%) of the total, which is a common feature of N.T. in the developing countries,[1,11,14] as a result of way of life and harmful cultural beliefs, like covering the umbilical stump with spore containing materials such as charcoal, kohl and ashes resulting from burning cow dung etc. This is more likely to be the route of infection, than the unsterilised instrument with which the cord was cut[1,11].

Six hundred sixty patients (63.3%) died, 199 cases (19.1%) were cured, and 184 (17.6%) were discharged on family request before achieving cure. This last category of newborns made the case fatality of 63.3% unreal because some of them might have died because of lack of treatment, so they were excluded in the study of case fatality rate. Total case fatality rate was 76.8% (Table 4) which looks high but it goes with that reported from other countries[1,2,8,11,14,16,17]. It is noteworthy that none of our patients was treated in intensive care units. Case fatality rate was 90% in the 3 days age group, confirming the clinical finding that the shortor the incubation period and onset of the disease are, the higher the mortality is[14]. In the 4-9 days age group the case fatality rate was 88.6% and it was 41.3% in the 10-30 days age group.

Most of patients died between 6th. and 10th. day of like, the mean was 9.9 days. The peak was on the 8th. day (Fig. 2).

It is interesting to know that this fenomenon is observed and well known in other countries. In Punjab N.T. is called "the 8th. day disease", because the majority of deaths occur in the 8th. day of life[18]. In St. Kilda, Island. the population of this remote island off the Atlantic coast of Scotland called N.T. "the disease of eight days" because it killed upto 4 out of 5 patients during the second week of life[4]. In colombia the observation is similar (Fig. 2).

EPI was the most important event which might affect the admission rate, causing the

steep decline observed in the 2 years which followed its beginning (Fig. 3).

In 1985, pre EPI acceleration figures showed that only 9% of pregnant women were covered with two doses of tetanus toxoid[18], but the results of post acceleration surveys in January 1986 and April 1987 showed that about 53% of pregnant women were covered with two doses of tetanus toxoid[19].

CONCLUSIONS AND RECOMMENDATIONS

Results obtained from the study, enables us to conclude that the clinico epidemiological pattern of N.T. in Iraq is similar to many other developing countries, regarding age, sex, date of onset, age at death and rural urban ratio. Regarding the seasonal variation, the pattern remains unchanged in the last 35 years.

We believe that the coverage rate of pregnant women with two doses of tetanus toxoid is still too low, and further efforts should be made to increase it. Although continuous immunisation of pregnant women is the most cost effective method of N.T. control, pregnant women represent a difficult target population for immunisation programs since only a small proportion of women seek preventive health care during pregnancy. Immunisation stratigies should therefore aim at reaching all women of reproduction age.

Continuous education of the "Daias"☆ through regular courses and follow up, help them to create aseptic condition during labour, and contribute to the complex process of neonatal tetanus irradication.

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☆ Daias: Popular women who assist delireries that take place at home, and who usually are ignorants, using impirical and trdrtional methodes in their practice.

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