

A 13-YEAR SURVEY OF PARALYTIC POLIO-MYELITIS IN THE PAEDIATRIC DEPARTMENT - KOMFO ANOKYE TEACHING HOSPITAL, KUMASI FROM 1973 - 1986

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ABSTRACT

A 13 year survey of paralytic poliomyelitis was carried out in Komfo Anokye Teaching Hospital which is situated in a tropical rain forest. The diagnosis was made clinically.

One thousand one hundred and sixty four cases of paralytic polio were recorded during the period of 13 years. The disease was found to be seasonal with June - October as the peak months. Children between 1 - 2 years formed 57.7% of all the cases of paralytic polio and 95.5% involved children under 5 years. The younger the child the more readily it developed paralysis after injections. Although chloroquine was the commonest drug injected (78%) antibiotics and DPT vaccines also provoked paralysis.

The death rate was found to be 3.1%. After physiotherapy 68% of the cases recovered from the paralysis, the remaining 32% involving children who had multiple injections had to use either calipers or clutches.

Injections may have played an important role in provoking paralytic poliomyelitis in this survey. Unnecessary injections should therefore be avoided. The tremendous decline of paralytic polio after 1980 in the survey is definitely due to the improved vaccination programme, which should further be intensified to completely eradicate this handicapping disease.

Keywords: Paralytic poliomyelitis, injection, immunization

INTRODUCTION

Paralytic Poliomyelitis occurs all over the world, and seems to have been described even in ancient Egypt. The peak of the disease is in the late summer and autumn months in the temperate zone. The first clinical description of the diseases was made by Underwood (1784) and Monteggia in 1813. Heine in 1840 named it infantile paralysis. Medin was the first to describe the symptomatology of the disease during the epidemic in Stockholm in 1887 [1]. The production of the vaccine was made possible through the research of Enders, Salk, Koprowski and Sabin.

The Francis-Report, published on 12th April, 1955, proved clearly beyond all doubt the importance of mass immunization against poliomyelitis in the U.S.A. with the inactivated Salk vaccine [2]. In Europe the most dramatic effect of mass immunization against polio can be seen in the Federal Republic of Germany where there were just over 4,600 cases of polio in 1961. Immunization against the disease was started in 1962 and one year after in 1963 only 180 cases of polio were reported! [3]

Modern research has shown that apart from the 3 serotypes of polio-viruses, ECHO, Coxsackie and Louping-ill viruses can cause symptoms very identical with those of paralytic poliomyelitis and that only virological examination can distinguish between them [2]. With civilization and improved hygienic conditions in developed countries, the age incidence of paralytic polio has been significantly shifted upwards and paralytic polio is found relatively more frequent among adolescents and adults. In developing countries, however, almost all children acquire their immunity before the age of 6 years due to the prevailing unhygienic conditions [4].

Many authors have suggested that once the virus has entered the body stress eg. injections, muscular exhaustion and surgical procedures can provoke paralytic polio [5]. In Europe and America, elective operations such as tonsilectomy are therefore postponed during epidemics.

The survey was done to find out:

1. whether paralytic polio occurs in and around Kumasi

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2. whether it is seasonal
3. whether injections are associated with paralytic poliomyelitis and
4. what measures can be taken to help reduce the incidence of the disease.

MATERIALS AND METHODS

The diagnosis of poliomyelitis was made when an alert child presented with sudden onset of asymmetric flaccid paresis without sensory changes. All cases of flaccid paralysis were referred to the paediatrician specialist for confirmation of the diagnosis and records were kept. In the records book not only the name, sex and address were recorded but also the mode of onset of the paresis and possible provocative factors, if any. Lumbar puncture was performed on all cases. The survey was started in January, 1973. All cases of paralytic polio with respiratory distress and fresh cases not older than seven days were admitted. The limit of seven days was chosen because in most cases the development of paralysis of new muscle groups is very rare after one week.

Komfo Anokye Teaching Hospital is situated in Kumasi about 300 km. north of Accra in a tropical rain forest region and serves a population of about 3 million. The major rainy season is from April - July and a minor one from September - October. December to February on the other hand is the so called harmattan season when the weather is extremely dry and dusty. The Komfo Anokye Teaching Hospital is the only well equipped hospital in the northern sector as far as management of paralytic polio is concerned. The Physiotherapy Department is well staffed and the equipment are adequate for the management of children with paralysis.

RESULTS

During the 13 years, a total of 1164 cases of paralytic polio were recorded, 485 of whom were girls and 679 boys, ratio of girls/boys is 100:140. The highest number of cases (138) were recorded in 1973, whereas 1982 with 23 showed the lowest incidence. (Table 1). Table 2 shows a steady decline of paralytic polio as from 1981.

TABLE 1: MONTHLY DISTRIBUTION OF PARALYTIC POLIO BY CALENDAR MONTH

| MONTH | JAN | FEB | MAR | APR | MAY | JUNE | JULY | AUG | SEPT | OCT | NOV | DEC | TOTAL |
|--------------|-----|-----|-----|-----|-----|------|------|-----|------|-----|-----|-----|-------|
| NO. OF POLIO | 59 | 57 | 64 | 67 | 87 | 107 | 127 | 136 | 138 | 136 | 85 | 67 | 1164 |

TABLE 2: YEARLY DISTRIBUTION OF PARALYTIC POLIO OVER A 13 YEAR PERIOD, 1973 - 1985

| YEAR | 73 | 74 | 75 | 76 | 77 | 78 | 79 | 80 | 81 | 82 | 83 | 84 | 85 | 86 | TOTAL |
|--------------|-----|-----|----|-----|-----|-----|----|-----|----|----|----|----|----|----|-------|
| NO. OF POLIO | 138 | 118 | 98 | 126 | 124 | 101 | 83 | 109 | 44 | 25 | 52 | 39 | 37 | 32 | 1164 |

The months of June through October were the peak months, whereas during the dry season December - February only very few cases were recorded (Table 1).

Table 3 indicates that the age group 1 - 2 years with 602 (51.7%) shows the greatest number of cases. Two hundred and one cases (22.4%) are found in age group 0 - 1 and 272 cases (23.4%) in age group 1 - 5. In other words 95.5% of all the cases in this survey involved children under five years.

TABLE 3: AGE DISTRIBUTION OF PARALYTIC POLIO

| Age | No. of paralytic polio | % of total No. of polio | No. of cases paralytic after injection | % in age group | Paralytic polio after measles | % of polio after measles in age group | No. of polio without prodromal syndrome | % in age group of polio without prodromal syndrome |
|-------|------------------------|-------------------------|--|----------------|-------------------------------|---------------------------------------|---|--|
| 0 - 1 | 261 | 22.4 | 231 | 88.5 | 81 | 31.0 | 38 | 14.5 |
| 1 - 2 | 602 | 51.7 | 394 | 65.4 | 110 | 18.2 | 40 | 5.8 |
| 2 - 5 | 272 | 23.4 | 160 | 58.5 | 28 | 10.3 | 14 | 5.1 |
| 5 | 29 | 2.1 | 5 | 17.2 | NIL | NIL | 4 | 13.7 |
| Total | 1164 | 100 | 790 | - | 219 | - | 96 | 8.2 |

Seven hundred and sixty cases out of the 1164 cases (67.9%) of paralytic polio were associated with history of prior injections. It was noticed that the younger the child the more readily the injections provoked paralysis and it was also severer and more wide spread than in older children. (Table 3).

In age group 0 - 1, 231 out of 261 cases (88.5%) had the polio after injections 68 cases (29.3% of which had paralysis of multiple muscle groups, whereas in age group 1 - 2 years 394 out of 602 cases (65.4%) had the polio after injections and only 56 (14.1%) developed widespread paralysis.

Fever was the commonest prodromal symptom and 704 cases (60.4%) had fever as the only symptom. Ninety six cases (8.2%) had no prodromal symptoms and the children surprised their parents one morning with paralysis. Two hundred and nineteen cases (18.8%) had the paralytic polio during measles.

Chloroquine was the commonest drug injected, 78% of all the injections was chloroquine because malaria was invariably diagnosed due to the febrile nature of the prodromal stage of poliomyelitis. Antibiotics were also given specially in children under 1 year. There were 3 cases of paralytic polio after D.P.T. injection in children under 9/12.

Paralysis of the limbs normally started 1 - 7 days after the injections or fever. Of the 1164 cases of paralytic polio 861 (74%) involved the lower limbs. Three hundred and thirty eight or 29% involved the right lower limb, two hundred and forty four (21%) the left and 279 (24%) both lower limbs. Two hundred and forty cases (21%) involved a combination of muscle groups. Eighty-four per cent of the children with paresis of multiple muscle group were children under 2 years.

There were 36 deaths due to respiratory failure

in bulbar type of poliomyelitis. All the children were under 2 years. Death rate is 3.1%. During the follow-up it was noticed that during the 1st 3 months all the children attended regularly for physiotherapy. After the 3rd month however the attendance dropped to 66%. The majority of the defaulters were those, who after 3 months did not notice any appreciable improvement. This group included all those who reported too late and all who had the polio after measles.

It was noticed that all the 96 children who developed paralysis without any prodromal symptoms and without injections recovered fully without any residual defect. Five hundred and seventy or 68% of those who developed the polio after injections recovered with only minimal residual paresis.

The remaining 32% who did not recover from the paralysis included all those with abdominal wall paralysis and those children who developed the polio during measles. These children eventually had to use crutches or calipers [9].

DISCUSSION

The main reason for the steady decline of cases of paralytic poliomyelitis since 1973 is due to the fact that immunization against the disease became consistent as from 1980, because of regular supply of vaccines and strict adherence to the principle of the cold chain.

In Ghana the most humid months are July, August, September with the mean monthly relative humidity of 90, 91 and 92 respectively [7]. It is known that in arid areas epidemics of paralytic poliomyelitis occur usually in years in which there has been abundant rainfall. The high mean monthly relative humidity during July-September may therefore explain why the peak of paralytic polio is in these months.

The results of the survey show that 95.5% of all the cases of paralytic polio in and around Kumasi involved children under 5 years. The youngest affected child was 5 months and the oldest 11 years. This fact suggests a possible protection of the young infant by transmitted circulating maternal polio antibodies during the first few months after birth [4]. It is therefore possible that almost all adults acquire polio virus infection before the age of 12. The antibodies then persist and continue to give protection even to the babies born by the females for the first 5 months of their life.

Although all the measles cases had multiple injections which could have provoked the paralysis when one is incubating polio, it is known that the measles virus suppresses the immunity by invading the lymph nodes and the thymus gland. These children then may become very susceptible to viral and bacterial infections [5], [8].

All the paralytic polio cases after measles had severe paralysis. It was evident in the survey that the

more the injections the severer the paralysis. It was noticed that both chloroquine and antibiotic injections could precipitate paralytic polio. In the light of the above observation, it is most probable that the stress of the injection per se and not the substance injected was the more important factor in provoking paralytic polio.

CONCLUSION

Paralytic polio is found in and around Kumasi, with peak in June to October. It is essentially found among children under 5 years. The youngest child was 5/12, which suggests a possible transmitted protective maternal antibodies in the young infant.

Injections undoubtedly play an important role in provoking paralytic poliomyelitis and the more the injections the severer the paralysis. The younger the child the more readily it gets paralysed after injections and the paralysis involves multiple muscle groups. In children above 3 years however only the injected limb got paralysed.

Measles may play a role by suppressing the immune system.

Paralytic polio is on the decline due to improved immunization programme and strict compliance with the regulations of the "cold chain".

Physicians should avoid unnecessary injections in young children especially below 3 years. Immunization against paralytic polio should be intensified to avoid provocative paralytic polio.

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