ORIGINAL ARTICLE

Clinical Profile of Acute Flaccid Paralysis

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Summary

This study was done to determine the clinical course, cause and outcome of Acute Flaccid Paralysis (AFP) in children. All AFP cases (<15 years) in the children's ward of Khulna Medical College Hospital (Bangladesh) were recorded, investigated and followed up to sixty days as a part of passive surveillance. Main outcome variables were vulnerable age group, vaccine status, predominant limb involvement, clinical variants, virus isolation and residual paralysis. Thirty-four children with AFP were admitted in hospital in the last three years with the highest number (14) in 1998. The majority of children belonged to the age group 5 - 9 years with a male female ratio of 1.3 : 1. Nearly one third of the cases were either partially vaccinated or not vaccinated at all. The lower limbs bore the brunt of paralysis excepting a few (14.7%). Clinically, Guillain Barre Syndrome was the commonest (47.1%) followed by encephalomyelitis. No poliovirus was isolated from these cases. Residual paralysis was observed in four out of ten cases who returned for follow up. AFP will continue to occur even after eradication of poliomyelitis and Guillain Barre Syndrome is the most important clinical entity for this.

Key Words: Acute flaccid paralysis, Poliomyelitis, Guillain Barre Syndrome

Introduction

Acute Flaccid Paralysis (AFP) is a syndrome with several possible causes. Poliomyelitis was the leading course of AFP in the prevaccine era[1] and society was reminded constantly of the devastating effect of this crippling disease. In 1988, the World Health Organization (WHO) estimated that approximately 3,50,000 cases of paralytic poliomyelitis occur annually, and adopted a global eradiction traget by the year 2000[2,3].

While poliomyelitis has been eradicated from many countries in Europe, the tropical countries of Asia are struggling to achieve eradication. For a country to be declared as polio free it needs to meet a few criteria[3]: poliovaccine coverage of more than 80%, no confirmed poliomyelitis cases for three years, sensitive surveillance of AFP and investigation of suspected cases of poliomyelitis. To achieve these criteria, Bangladesh has implemented a number of strategies including conduction of National Immunization Days (NID) to interrupt widespread circulation of poliovirus[4]. The number of reported polio cases decreased from 520 in 1988 to 207 in 1995.

National AFP reporting began in 1996 and the identification of AFP rose from 99 in 1996 to 167 in 1997. While the reported number of AFP cases were increasing, the confirmed polio cases were decreasing which indicates AFP surveillance in Bangladesh is improving but still it is below the

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standard level (80%) of the target i.e. 1/1,00,000[5]. In 1999, wild poliovirus was isolated from 29 children in 6 divisions but over 12,000 children may have been infected with wild poliovirus because surveillance detects only 50% cases and paralysis occurs in only one of every 200 infected children[6].

The differential diagnosis of Acute Flaccid Paralysis includes Guillain Barre Syndrome (GBS), transverse myelitis and traumatic paresis[6,7]. Other Entero viruses may mimic poliomyelitis as well[7]. Although these cases are prevailing in the community, the reporting is still inadequate. An understanding of the natural history of AFP is necessary to boost surveillance. The aim of this study was to ascertain the clinical course, causes and outcome of AFP cases in a medical college hospital.

Materials and Methods

Khulna Medical College Hospital (KMCH) is the only specialized teaching hospital the in Khulna division of Bangladesh which drains patients from 10 different districts. The annual admission rate in the children's ward of KMCH is around 1600 between the age of 0 - 12 years. Among these, all the patients presenting with AFP were taken into account. Adolescents (<15 years) with AFP were also admitted in the children's ward particularly for surveillance and included for this study.

A case of AFP was defined as a child aged less than 15 years with acute onset (<2 weeks) of flaccid paralysis in one or more limb or acute onset of bulbar paralysis[7]. History and physical findings were noted for each case in a predesigned proforma. After history taking and physical examination by the clinical assistant, information was sent to the district surveillance officer for collection of two stool specimens from the patient preferably 24 hours apart within 14 days of onset of illness[8]. Clinical diagnosis of poliomyelitis was based on WHO criteria[8]. Characteristic features for similar illness were worked out from the reports of different authors[9-11].

CSF was drawn from each patient (unless contraindicated) for biochemical and cytological analysis. Final diagnosis was made at the time of discharge and patients were asked to report after 60 days for evaluation of residual paralysis. AFP cases were classified into three variants on established surveillance system[12].

- Poliomyelitis: An AFP case with wild poliovirus isolation
- Non polio AFP: An AFP with adequate stool specimen testing negative or with no residual paralysis except if wildvirus is isolated.
- Polio compatible AFP: An AFP case with residual paralysis or who died or was lost for follow up, in whom stool specimens were either not taken or inadequate.

Stool culture reports for virus were collected from the National virology laboratory and checked with clinical diagnosis. All the data after analysis were transferred to tables and figures. Statistical correlation was based on proportion and percentage.

Results

Thirty-four cases of AFP were admitted between January 1997 and December 1999. The total admitted cases during this period was 4826. Out of the 34 cases, 19 were male. The ages of affected children ranged from 5 months to 14 years but the frequency was higher in the middle group (Table I). The number of admitted cases rose from 11 in 1997 to 14 in 1998 and then fell to 9 in 1999. Adequate stool samples were collected from 7, 11 and 8 cases respectively.

Three or more vaccine uptakes by a child was considered as full vaccination. Seven cases received only one or two vaccinations whereas 3 cases were not vaccinated at all. Twenty children had paralysis of lower limbs and 9 cases had paralysis of both upper and lower limbs. Five cases had bulbar paralysis (3 with GBS and 2 with encephalomyelitis) and four of them died.

Table I
Distribution on Age & Sex

Age	Male	Female
0 - 4 years	6	5
5 - 9 years	9	7
10 - 14 years	4	3
Total (%)	19 (55.9)	15 (44.1)

Table II
Clinical Variants

	Number	Percentage
Guilliane Barre Syndrome	16	47.1
Encephalomyelitis	09	26.6
Transverse Myelitis	05	14.7
Traumatic Neuritis	02	5.8
Poliomyelitis	02	5.8

Sixteen cases of AFP were clinical diagnosed as Guillain Barre Syndrome (Table II). Next in common was 9 cases of encephalomyelitis. Only 2 cases had clinical resemblance with poliomyelitis. No wild poliovirus was isolated from stool samples of any case. Since adequate stool samples were collected from 26 cases, they were classified as non-polio and the remaining 8 as polio compatible AFP.

During discharge at the end of 2 - 4 weeks, 15 had paralysis and 10 cases turned up after 2 months. Four cases were identified as having residual paralysis. Clinically these were GBS (1), encephalomyelitis (2) and transverse myelitis (1). Virologically, three was non-polio and the last one was polio compatible.

Discussion

Acute Flaccid Paralysis is the term used in public health programme to identify suspected patients with paralytic disease consistent with acute poliomyelitis[13]. It is characterized by rapid onset of weakness of limbs progressing to maximum severity within 1 - 10 days, hypotonia, reduced tendon reflex and no upper motor neurone sign. Paralytic disease due to enterovirus and mumps virus occur sporadically. In certain circumstances oral polio vaccine can cause AFP and the estimated risk is 1 per 2.5 million dose administered[14,15]. The expected rate of AFP in a polio free country is 1 case per 1,000,000 children under 15 years[7]. Surveillance in America found an annual incidence of 1.4 cases and 1.10 in the UK[6,16]. Under reporting is the principle problem in underdeveloped countries but in Bangladesh the figure was 1.46 in 1999[5].

Children are immunologically susceptible to poliomyelitis and their unhygienic habits facilitates spread. The number of AFP cases were approximately 7 per 1000 admitted children. Age distribution showed great variation, with a peak at 5 - 9 years through at 10 - 14 years. Sokhey & Kakre in their study observed a peak number of polio cases between 1 - 9 years[17,18]. This again supports the clinical diagnosis of non polio AFP cases in the higher age group. In this study, male female ratio was 1.3:1. Although the incidence of infection and prevalence of antibodies do not differ in boys and girlsthe disease is more common in boys[9]. The male preponderance in this study was probably due to more parental concern about their male children.

FPI in Bangladesh was initiated in 1979 and intensified in 1985. Although reported coverage with OPV3 among children was stable at 87 - 98% since 1991, annual independent surveys during 1992 - 97 indicated actual coverage at 64 - 74%[4]. National Immunization Days (NID) have been conducted in Bangladesh since 1995 and it was effective in reducing polio by 97% but coverage is gradually decreasing. In our hospital fewer AFP cases have been recorded in the last three years except in 1998 which seems to be due to improved surveillance system. It does not reflect the true incidence in the community. In 1997, Bangladesh began the implementation of a comprehensive plan for AFP surveillance that

includes surveillance at different levels[19]. Two doctors in KMCH - one indoor (Clinical Assistant) and other outdoor (Resident Physician) are engaged in surveillance and also keep contact with district surveillance officers for collection of stool samples.

Among all, 20.6% cases were partially immunized and 8.8% cases were not immunized at all which divulges the drop out cases even after repeated NID. Each year 15 - 20,000,000 children are missed at NID[5]. Bangladesh is conducting the 7th intensive NID in 2000 to cover those hard to reach children.

In Australia, Herceg observed 19 out 33 cases had quadriparesis, 6 had paralysis, 1 had monoparesis and there was no information on 7 cases[8]. We found lower limb involvement in most (85.3%) of the cases. In spinal poliomyelitis cervical and thoracic segment are chiefly affected whereas with other virus infections there is no area of special prediliction[9].

The majority of cases were GBS (47.1%) followed by encephalomyelitis (26.6%). Clinical polio was diagnosed in 5.9% cases of reports from Australia showed 48% cases being GBS 15% transverse myelitis and 3% polio like illness[8]. No vaccine related cases were identified in this study. Solomon et al discovered totally new viral causes for AFP in children[10]. In endemic areas like India, Japanese Encephalitis virus infection in children can produce damage to the anterior horn cells of the spinal cord as in poliomyelitis. However the presence of urinary retention, pyramidal tract signs and unconsciousness are rare in poliomyelitis[10]. In general, GBS accounts for 50% or more of cases of AFP in the absence of wild virus induced poliomyelitis[16]. At times non-polio enteroviruses have been associated with polio like paralytic disease. Motor neurone disease, although rare in children can be distinguished only by electromyography. No cases of botulism or diphtheric neuropathy were recorded during this study. One case of post rabies vaccine paralysis were included under transverse myelitis which is consistent with other reports[10]. Two cases of traumatic neuritis were inflicted by intragluteal injection and lumber spine injury.

The number of polio compatible cases (8) designates the weakness of surveillance. However the drop out cases decreased last year suggesting an improvement. No polio case was detected virologically during this period. Accepting the limitation in follow up, only 40% cases had residual paralysis. Clinical polio cases were neither virologically positive nor had residual paralysis.

In conclusion, intensive surveillance is essential to reach the goal of polio eradication in this subcontinent. However AFP will continue to occur even after eradication of poliomyelitis with GBS at the main cause. Therefore virus isolation should be continued to determine other important causative agents.

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