

A clinical study of post polio infantile paralysis

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Abstract

This study reports on 3,000 cases of poliomyelitis seen at the Rehabilitation and Artificial Limb Centre at Lucknow between January 1976 and December 1980.

Factors such as age and sex incidence, extremity involvement, incidence of deformities at hip, knee and ankle, lower limb discrepancy, treatment and orthoses prescribed are discussed.

Introduction

Poliomyelitis is still endemic in India and on average poliomyelitis may be seen in 15-20% of the cases in the outpatient clinics of any paediatric or orthopaedic hospital. These patients, if not given proper care, develop various deformities and contractures which further delay their rehabilitation programme. Those deformities are directly proportional to the amount of disability and this depends upon the site and extent of the involvement, but there is no definite data to indicate the patterns of distribution of paralysis due to poliomyelitis. Thus this clinical study was undertaken in retrospect to determine the magnitude of the problem and with the aim of deciding the early rehabilitation programme for such cases.

Methodology

All the cases of poliomyelitis who reported for treatment in the outpatient clinic of the Rehabilitation and Artificial Limb Centre, Lucknow, from January 1976 until December 1980, have been studied. Each case was assessed by a team of medical and paramedical staff. The paramedical team consisted of a medical social

worker, an occupational or physiotherapist, an orthotist and a vocational counsellor. The cases with severe contractures and deformities, in whom corrections could not be achieved in spite of conservative treatment, were subjected to surgery and were later fitted with suitable orthoses. Patients with involvement of all four extremities and spine posed a special challenge for the whole rehabilitation team.

Discussion

During the last 5 years, 20,200 new cases were seen in the outpatient clinic of the Rehabilitation and Artificial Limb Centre, Lucknow. Of these, 3,000 cases (14.8%) were of poliomyelitis. A steady increase in the attendance of polio cases was noted (Table 1) which may be due to the increased incidence of poliomyelitis (Arora et al. 1978; Basu, 1981; Pandey, et al. 1979; John, 1981) or to increased awareness of facilities available for management of the condition.

Table 1. Incidence of poliomyelitis

Year	Number of cases	Polio cases	Percentage
1976	2,697	293	10.8
1977	2,432	308	12.7
1978	3,881	513	13.2
1979	5,079	786	15.5
1980	6,131	1,100	17.9
Total	20,220	3,000	14.8

The involvement of males was found to be greater than females in the ratio of 1.3:1; most of the patients were children mainly in the age group 1-3 years (Ajao and Oyemade, 1981; Kumar and Arun,). Although the majority of cases, 50.5% (1,510 cases), were less than 3 years of age, many older patients also reported for treatment, 17.7% (531 cases) were over 9 years of age (Table 2).

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Table 2. Age and sex incidence

Age (years)	Male	Female	Total	Percentage
Less than 1	202	133	335	11.2
1-3	656	523	1,179	39.3
3-6	392	270	662	22.1
6-9	160	133	293	9.7
Above 9	300	231	531	17.7
Total	1,710	1,290	3,000	100

Most of the cases in the acute stage or in the early stage of poliomyelitis did not attend the specialized clinics due to ignorance and other socio-economic factors. Those who come some distance for treatment usually report at first to general practitioners or paediatric or orthopaedic clinics. Thus treatment in the specialized centres is usually given in the later stages, either in the convalescent or residual stage. In the present study, 48% (1,440) cases were in the convalescent phase and 41.3% (1,210) were in the residual stage. Thus it becomes more difficult to plan the future rehabilitation programme in such cases. As far as rural and urban population is concerned there was not much appreciable difference in the incidence in this series.

More than half of the total cases (50.7%) had not taken any treatment prior to their first attendance (Table 3) at the Rehabilitation and Artificial Limb Centre, Lucknow and the others had undertaken various types of conservative or surgical treatment. A large number of these cases have no access to proper facilities and a good referral system is not available. A long term rehabilitation programme for such patients should be mapped out for individual cases and emphasis should be placed on regular follow-up management. This will really help in preventing the recurrence of deformities and contractures.

It was observed that the lower limbs were more often affected (95.2%) than the upper limbs and, in addition, the paravertebral muscles

Table 3. Treatment received before attendance

Treatment taken	Number of cases	Percentage
No treatment	1,520	50.7
Conservative treatment	1,266	42.2
Surgical treatment	214	7.1
Total	3,000	100

Table 4. Extremity involvement

Extremity involved	Number of cases	Percentage
One upper limb	139	4.63
Both upper limbs	5	0.17
One lower limb	1,909	63.63
Both lower limbs	809	26.97
One upper limb and one lower limb	64	2.13
One upper limb, spine and one or both lower limbs	37	1.23
Both upper limbs, spine and one lower limb	3	0.10
All four limbs and spine	34	1.13
Total	3,000	100

were also involved at times along with the lower limb (Table 4). Many workers in the study of poliomyelitis have reported affection of lower limbs varying between 85 and 90%, (Ajao and Oyemade, 1981; Kumar and Arun; Punatar and Patel, 1977; Sachdeva and Gupta, 1972).

In further evaluation of the upper limb, 55 cases (19.5%) had completely flail upper limbs and 38 cases (13.5%) had partial involvement (Table 5). In the rest of the cases either the shoulder or wrist and hand were flail. In unilateral upper limb involvement, satisfactory readjustment occurs due to the normal upper limb and the person is more or less independent in his activities of daily life and can perform sedentary types of work. With the limited resources and manpower available it is not feasible to undertake long term planning and follow-up of these cases. Even after surgical intervention results are not very encouraging in such cases.

A detailed evaluation of lower limb involvement revealed that more than half of these cases had mild to severe deformities on their first attendance (Tables 6, 7 and 8). This is a

Table 5. Upper limb—clinical presentation

Presentation	Number of cases	Percentage
Flail (complete)	55	19.5
Flail shoulder	115	40.8
Flail elbow	6	2.1
Flail wrist and hand	68	24.1
Limbs with partial involvement	38	13.5
Total	282	100

significant observation which reflects not only the health care delivery system, but shows lack of proper guidance, apathy and other socio-economic problems. The majority of these cases presented themselves crawling or in some other badly deformed posture due to the severe soft tissue and bony involvement and malposition (Ajao and Oyemade, 1981; Cross, 1977; Huckstep, 1975).

Table 6. Incidence of ankle deformities

Deformity	Number of cases	Percentage
Equinus	687	40.2
Valgus	296	17.3
Cavus	249	14.5
Varus	186	10.9
Calcaneus	121	7.1
Others	171	10.0
Total	1,710	100

Other studies have shown a greater variation in the deformities (Sachdeva and Gupta, 1972). The present study reveals various combinations of deformities. Deformities around the ankle (1,710 cases) outnumbered those of hip (614 cases) and knee (608 cases). Equinus deformity (681 cases) was the most common ankle problem followed by valgus and varus deformities (Table 6). Surprisingly, weakness of the plantarflexors was seen only in 121 cases leading to calcaneus deformity. Around the hip the commonest deformity was flexion, abduction and external rotation (546 cases); subluxation or dislocation was found in only 21 cases (Table 7). The pattern of deformities around the knee is shown in Table 8, the most common being hamstring contractures, found in 259 cases, followed by genu recurvatum (174 cases) and genu valgum (158 cases).

Table 7. Incidence of hip deformities

Deformities	Number of cases	Percentage
Flexion, abduction and external rotation	546	88.9
Abduction	3	0.5
Pelvic obliquity	44	7.2
Dislocation/subluxation	21	3.4
Total	614	100

Table 8. Incidence of knee deformities

Deformity	Number of cases	Percentage
Flexion	259	42.6
Genu recurvatum	174	28.6
Genu valgum	158	26.0
Genu varum	13	2.1
Subluxation	4	0.7
Total	608	100

Lower limb discrepancy in the form of shortening was observed in 460 cases out of which 262 cases had shortening of more than $\frac{1}{2}$ " (12.5 mm) (Table 9). One case had shortening of 6" (150 mm).

Table 9. Lower limb shortening

Age (years)	Less than $\frac{1}{2}$ " (12.5 mm)		Between $\frac{1}{2}$ "-1" (12.5-25 mm)		More than 1" (25 mm)	
	Male	Female	Male	Female	Male	Female
1-3	49	25	20	12	2	1
3-6	49	25	23	6	—	—
6-9	25	10	25	8	2	—
Above 9	9	6	53	37	51	22
Total	132	66	121	63	55	23

Initially all these cases were subjected to different regimes of occupational and physiotherapy for their comprehensive management. They were provided with proper treatment to support or prevent deformities during their conservative management (Table 10). Out of 3,000 cases, 2,210 were prescribed an orthosis or special footwear along with conservative management; 404 cases required some surgical procedure prior to fitting an orthosis. It should be mentioned here that due to socio-economic and cultural constraints every patient was unable to undertake the treatment as prescribed and there were many dropout cases. However, 2,210 appliances for proper

Table 10. Treatment prescribed

Treatment prescribed	Number of cases	Percentage
Conservative treatment alone	386	12.87
Orthosis and shoes along with conservative treatment	2,210	73.66
Surgery	404	13.47
Total	3,000	100

ambulation of these cases have been fitted, the most common being KA and AF orthoses followed by surgical footwear and bilateral HKA orthoses (Table 11).

Table 11. Supply of orthoses

Orthosis	Number of appliances	Percentage
Bilateral HKA orthosis with pelvic belt and hip joint	266	12.04
KA orthosis	999	45.20
AF orthosis	575	26.02
Special orthopaedic shoes	370	16.74
Total	2,210	100

Summary and conclusions

A retrospective clinical study of 3,000 cases of post polio infantile paralysis was carried out at the Rehabilitation and Artificial Limb Centre, Lucknow with an incidence of 14.8%.

The prevalence of poliomyelitis has shown a trend to increase. The greatest number of cases reported were found in the 1-3 years age range (39.3%)

Males were more common than females, however this difference was in proportion to the general sex ratio of the population at large. The study reveals a greater number of attendances during the later stages of poliomyelitis.

No appreciable difference was noticed between the incidence in rural and urban population.

Affection of the lower limb was the greater compared to the upper limb. Nearly half of the cases had not received any treatment prior to attending the outpatient department at the Rehabilitation and Artificial Limb Centre.

To conclude, it is strongly suggested that an adequate inoculation campaign against polio, early detection and proper treatment of the cases will decrease the incidence of poliomyelitis and reduce the morbidity. Further, the opening of specialised centres, as recommended by Agarwal and Goel, (1978), on a three tier system is a necessity in the present circumstances. In the light of the experience gained over the past 5 years in rural camps, unless and until medical

and rehabilitative facilities are provided at the doorsteps of the patients, no great advance can be achieved.

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