THE LONG TERM PROSPECTS OF REHABILITATION IN CEREBRAL PALSY IN SINGAPORE

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INTRODUCTION

Cerebral palsy is the result of lesions in the motor centres of the brain either before birth, at birth or during infancy and childhood. It does not only produce a neuromuscular dysfunction but often causes mental retardation, sensory disorders, convulsions, eye and ear disabilities and behaviour disorders as well. Due to the multiplicity of physical and mental dysfunctions present in cerebral palsy, it is a great challenge to those involved in the rehabilitation of this category of disability. Rehabilitation is therefore a tedious process, often punctuated with frustration and disappointment and sometimes ends in total failure.

Singapore, an island nation in South East Asia with a land area of 600 sq km and a multiracial population of 2.35 million as recorded in December 1978, has 1,440 known cases of cerebral palsy registered with the Department of Paediatric Medicine of the Singapore General Hospital. As in other countries, we too experience the difficulty of having all cerebral palsied children registered and there are many more who are still alive and yet unknown to us. In Singapore, rehabilitation of the cerebral palsied is carried out at two centres, namely the Department of Rehabilitation Medicine at the Singapore General Hospital in conjunction with the Departments of Paediatric Medicine and Orthopaedic Surgery, and the school for spastics run by the Spastic Children's Association of Singapore which was founded in 1957. In 1975 a workshop was added to the school to train those between the ages of 17 and 30.

Towards, the latter half of 1978 a survey was conducted on some adult spastics in the age group of 17 to 30. The aims of the survey are threefold:—

1. To reappraise the cost-effectiveness of running the school in terms of the number of children successfully rehabilitated.
2. To analyse the causes of unemployment amongst those surveyed and to use these findings to improve, upgrade and diversify the program of the school vocational training to meet the changing needs of our society.
3. To set up an adult spastics club within the Association to provide a continuous service to those who have left the school.

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MATERIAL AND METHOD

The survey was conducted by the Spastic Children's Association of Singapore with the help of the Rehabilitative Services Section of the Ministry of Social Affairs which also keeps a register on spastics in Singapore. It was decided that a cross-section of those known cases between the age group of 17 and 30 should be surveyed, as we felt this is the adult group who should have left school by now and are either helping at home or having a job elsewhere if they have been successfully rehabilitated. Due to the rapid urbanisation and resettlement of the population in Singapore, about half of the 594 cases in this age group who are registered with the Association are untraceable. A random sample of 120 from the remaining cases was therefore selected, and each of the 120 cases was visited personally by a staff of the Association, each armed with a set of questionnaires on personal particulars.

RESULTS

1. **SEX AND AGE GROUP (TABLES 1A & 1B)**

   There were altogether 82 males and 38 females surveyed. 50.8% of them were in the age range of 21 to 25 years whereas 32.5% were between 17 and 20 years and 16.7% were between 26 and 30 years.

2. **SOCIO-ECONOMIC STATUS (TABLES IIA & IIB)**

   Only 34.2% come from families with less than five siblings and the rest were from families with more than five siblings. 86.7% of these cases belonged to the lower middle income group and the lower income group whose total family income is below S$1,000/= per month.

3. **TYPES OF CEREBRAL PALSY (TABLE III)**

   In this survey we have 28 hemiplegics, 45 diplegics or quadriplegics and 47 athetoids.

4. **INVOLVEMENT OF SPEECH, HEARING AND EYESIGHT (FIGURES I, II & III)**

   It has been estimated that 75% of all children with cerebral palsy have speech defects, and 50% suffer from squint. In our survey 7.5% had no speech and 45% had some speech defects. 5% of the cases were deaf and 11.7% had some hearing defect. Only 4.2% were either blind or had squint eyes.

5. **MOBILITY AND A.D.L. PROFILE (TABLES IVA & IVB)**

   69.2% of these adults were able to ambulate independently on one level although most of their gaits were not normal; 16.7% could move from one place to another with the help of aids or appliances; 7.5% could move about reasonably well in wheelchairs but 6.6% were totally bedridden. In activities of daily living (A.D.L.) 74.2% were totally independent; 14.2% were partially independent and 11.6% were totally dependent.

6. **EDUCATION (TABLES VA & VB)**

   Most of these cases had at one time or another been to the school for spastics for assessment of their physical and mental disabilities and those with least physical and mental disabilities were advised to attend schools for normal children, whereas those who were mentally retarded were sent to the school for educationally subnormal (E.S.N.). In this survey, 45 had attended normal schools, 51 went to the school for spastics, 5 attended the E.S.N. school whereas 19 did not go to school at all. Of the 101 who had received education, 88.1% were able to reach the primary level, 9.9% reached the secondary level and only 2% could manage to continue study at the tertiary level.

7. **PHYSICAL AND VOCATIONAL THERAPY (TABLES VIA & VIB)**

   72.5% of the cases had received therapy either at the Singapore General Hospital or at the school for spastics. 50.8% had received some form of vocational training either at the school for spastics or at the various Government Vocational Schools for normal children.

8. **EMPLOYMENT (TABLES VIIA, VIIB, VIIC)**

   When we say of a disabled of employable age being successfully rehabilitated we automatically think of him or her being gainfully employed, or at least being independent in self-care activities. In this survey 36.7% (44) of the cases were gainfully employed at the time of survey. A breakdown analysis shows that 25 worked in factories of whom only 2 worked in a sheltered workshop; 10 were office workers of whom 4 were clerks, 3 were office boys, 2 were lift attendants and one was a qualified accountant; 6 were unskilled manual workers of whom 5 were labourers and one was a car-washer; and 3 worked as domestic help.

   There were various reasons for unemployment amongst the remaining 76 spastics. 17 of them had severe physical disabilities; 21 were mentally retarded; 13 were either not trained or lacked motivation coupled with poor work discipline and low work tolerance; 8 had transport problems and parental objections; 6 were still studying; and 11 could not find suitable jobs.

   Of the 44 who were working, 38 were independent in ambulation and 6 could walk with some form of aids or appliances. And of the 76 who were unemployed, 45 were independent in ambulation, 14 needed aids or appliances to walk, 9 used wheelchairs to move about and 8 were bedridden. (Table VIID).

TABLE IA — SEX DISTRIBUTION

Sex	Number	Percentage
Male	82	68.3
Female	38	31.7
Total	120	100.0

TABLE IB — AGE GROUP

Age	Number	Percentage
17 — 20	39	32.5
21 — 25	61	50.8
26 — 30	20	16.7
Total	120	100.0

SOCIO-ECONOMIC PROFILE

TABLE II A — FAMILY SIZE (No. OF SIBLINGS)

Siblings	Number	Percentage
1 — 4	41	34.2
5 — 7	55	45.8
8 — 10	20	16.7
Above 10	4	3.3
Total	120	100.0

TABLE IIB — TOTAL FAMILY INCOME

Total Income	Number	Percentage
Lower Income Group (Below S$500/-)	48	40.0
Higher Income Group (Above S$1000/-) Total	56	46.7
Middle Income Group (S$500/- — S$1000/-)	16	13.3
Total	120	100.0

SENSORIA INVOLVEMENT

FIGURE 1: SPEECH

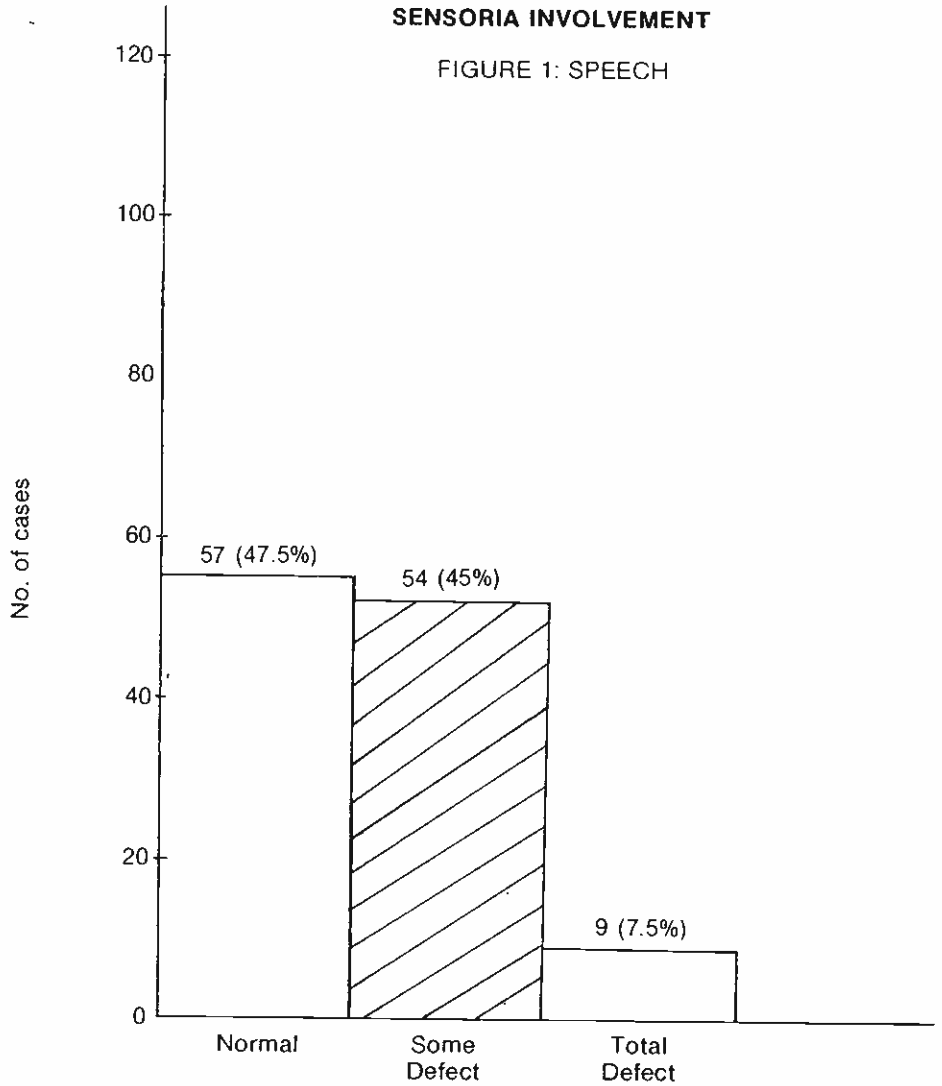

FIGURE II — HEARING

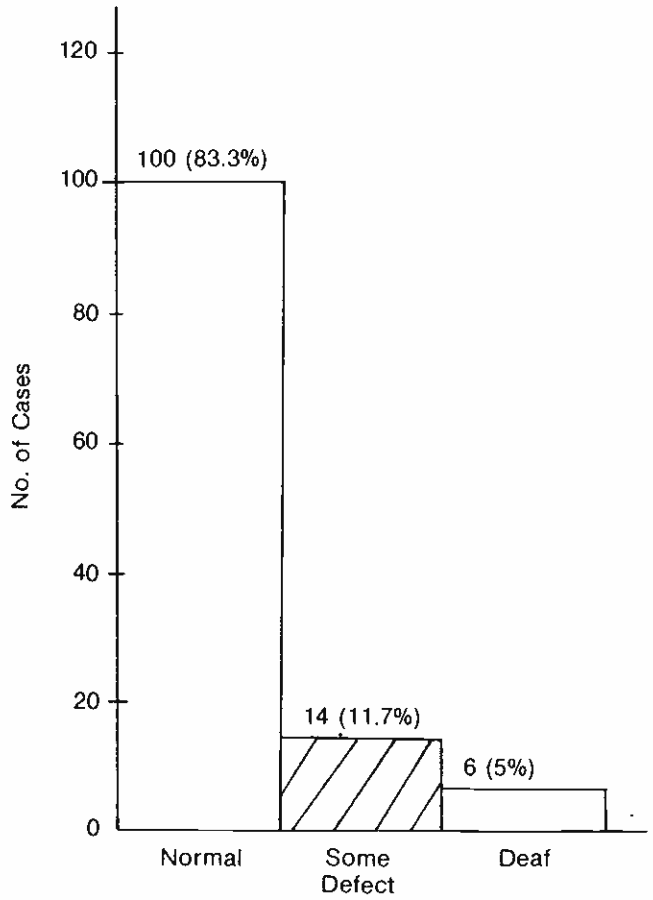

FIGURE III : EYESIGHT

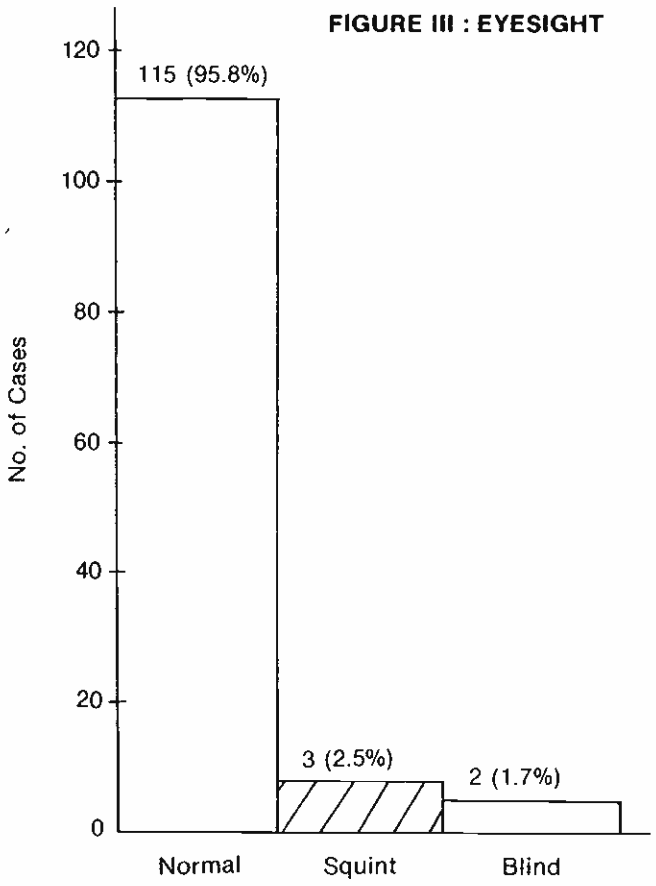

TABLE III — TYPES OF CEREBRAL PALSY

Types	Number	Percentage
Hemiplegics	28	23.3
Diplegics/Quadriplegics	45	37.5
Athetoids	47	39.2
Total	120	100.0

TABLE IVA — MOBILITY PROFILE

Level of Independence	Number	Percentage
Independent In Ambulation	83	69.2
Independent In Ambulation With Aids/Appliances	20	16.7
Independent In Wheelchair	9	7.5
Bedridden	8	6.6
Total	120	100.0

TABLE IVB — SELF-CARE INDEPENDENCE (A.D.L.)

Level of Independence	Number	Percentage
Total Independence	89	74.2
Partial Independence	17	14.2
Total Dependence	14	11.6
Total	120	100.0

TABLE VA
EDUCATION — TYPES OF SCHOOL ATTENDED

School	Number	Percentage
Normal Schools	45	37.5
S.C.A. School	51	42.5
E.S.N. School	5	4.2
Nil	19	15.8
Total	120	100.0

S.C.A. = Spastics Children's Association
E.S.N. = Educationally Subnormal

TABLE VB — LEVEL OF EDUCATION

Level	Number	Percentage
Primary	89	88.1
Secondary	10	9.9
Tertiary	2	2.0
Total	101	100.0

TABLE VIA

THERAPY GIVEN (P.T./O.T./S.T.)

	Number	Percentage
Yes	87	72.5
No	33	27.5
Total	120	100.0

TABLE VI B — VOCATIONAL THERAPY

	Number	Percentage
Yes	61	50.8
No	59	49.2
Total	120	100.0

TABLE VII A — EMPLOYMENT STATUS

	Number	Percentage
Gainfully Employed	44	36.7
Unemployed	76	63.3
Total	120	100.0

TABLE VII B — TYPES OF EMPLOYMENT

Jobs	Number	Percentage
Factory Work	25	56.8
Office Work	10	22.7
Domestic Work	3	6.9
Unskilled Manual Work	6	13.6
Total	44	100.0

TABLE VII C — REASONS FOR UNEMPLOYMENT

Reasons	Number	Percentage
Physical Disabilities	17	22.9
Mental Disabilities	21	27.1
Not Trained/Lack Of Motivation	13	17.1
Lack Of Suitable Jobs	11	14.5
Transport Problems	8	10.5
Still Schooling	6	7.9
Total	76	100.0

TABLE VII D — EMPLOYMENT STATUS IN RELATIONS TO MOBILITY

Level Of Independence	Employed	Unemployed
Independent In Ambulation	38	45
Independent In Ambulation With Aids/Appliances	6	14
Independent In Wheelchair	0	9
Bedridden	0	8
Total	44	76

DISCUSSION AND PLANNING

The results of this survey show us that the long-term prospects of rehabilitation in cerebral palsy is good for those with minimal physical and mental disabilities, but is disappointing for the very disabled. The Singapore Spastics Association spends about half a million dollars annually to run the school which has an annual enrolment of 150 school children, 60 preschoolers and 30 adult spastics between the age of 17 and 30 who are undergoing vocational training in the workshop. Most of the school teachers are paid by the Ministry of Education.

The Association has long realised that to fully utilise the limited manpower and to spend the limited fund from charity in a more meaningful and fruitful way, an effective and comprehensive plan has to be set up as soon as possible for the school. For this purpose, all spastic children are thoroughly and meticulously assessed at the school and then streamed into 3 categories. The first category are those with minimal physical and mental disabilities. They are sent to study in normal schools. The second category are those whose disabilities can improve with time and constant therapy. This group is allowed to study in the spastics school. The third category are those who are very disabled. This group will initially be given treatment at the school and at the Singapore General Hospital with full participation of the parents or guardians who are taught basic techniques in the prevention of joint contractures and on how to teach their children to be independent in self-care. After 3 to 6 months this group of children is discharged home and the parents are expected to continue treating them at home. A domiciliary team of physiotherapists and occupational therapists will visit them at regular intervals to reassess the children's progress and to advise parents faced with problems in managing their children. Parents are thus relieved of the inconvenience of accompanying their children to and from the school daily and the school will economise on transport which is normally provided for most of the school children. In this way more children can be absorbed by the school each year. Lateral transfers amongst these 3 categories are encouraged from time to time depending on individual progress.

As the school allows children to study until the age of 16, a vocational training workshop was established within the school to cater for those between 17 and 30 years of age. Pupils are taught woodwork, metal-work, and home economics. They learn good work habit, work tolerance and work discipline. Job placement for promising candidates in open factories are arranged from time to time by the staff. As 50% of those unemployed in our survey were due either to physical or mental disabilities, efforts are made to give them a more meaningful life by securing certain simple jobs for them to do at home so that they can earn some pocket money. This scheme will also be extended to those with transport problems, those waiting for suitable jobs and those with no motivation to work. It is expected that family members will help these cerebral palsied in their jobs at home. Another plan currently studied by the Singapore Council of Social Services is to provide Hostel, near industrial estates for those with transport problems.

To ensure continuation of service to the cerebral palsied after they have left school, an adult club needs to be formed within the Association. Ideally parents should play an active role in this club which should provide services like vocational guidance, social integration, recreation and free communication of knowledge amongst the adult spastics. This club should also keep track of the welfare of all registered adult spastics at all times.

CONCLUSION

This survey gives us some insight into the long term prospects of rehabilitation in cerebral palsy in Singapore and to ensure that the money spent on the school will benefit the maximum number of spastics, some of the plants I mentioned earlier have already been implemented and we hope the whole scheme will go into full function as soon as we have enough manpower.

REFERENCES

1. George G. Deaver: "Cerebral Palsy, Methods of evaluation and treatment." Rehabilitation Monograph IX, 3, 17, 1967.