EXPERIENCES WITH TRENTAL IN STROKE REHABILITATION

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Introduction

The Dept. of Rehabilitation Medicine (DRM), admits stroke patients with physical disability following the acute phase. The purpose of admission is to assess the degree of neurological deficit and functional handicap in ambulation and self-care activities of daily living (A.D.L.) The patients then participate in an intensive (whole day) programme of physical, occupational and speech therapy under medical direction. The objective is to achieve maximum independence in mobility (ambulation) and A.D.L.

The major neurological deficit is usually hemiplegia with or without aphasia. However, the outcome of medical rehabilitative measures depend on the degree of cerebration i.e., mental/emotional state which determines the patient's ability to participate actively in the prescribed programme of rehabilitation therapy. Many patients do not have cerebration problems but it was decided to use Trental on a group of patients with apparently poor degree of cerebration affecting their progress in rehabilitation.

Clinical Material and Methods

All stroke patients who are transferred to the DRM are assessed during their first week of admission by the Rehabilitation Medical Team comprising the doctors, nursing staff, physical, occupational and speech therapists and medical social worker. An assessment meeting is held once a week and the degree of disability and handicap is coded using the Profile System.

Trental at the dose of 100 mgm. t.d.s. was started on patients who were noted to have poor cerebration i.e., on their profile code. The degree of locomotor or speech disability was also coded but this was not considered as a basis for the drug therapy.

Neither was the degree of functional handicap in ambulation or A.D.L. considered likewise (although coded).

The Profile System of Disability Classification

This system was adapted for local use from that designed by E. Moscowitz (1957) and J.B. Millard. (1972). All staff are familiar with the classification and patients are coded on admission and discharge by the Team.

I. The Disability Profile (D.P.): Table 1

Table 1: THE PROFILE SYSTEM OF DISABILITY CLASSIFICATION
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1. DISABILITY PROFILE:

SCORE	P	U	L	S	E	C
NORMAL	0	0	0	0	0	0
MAXIMUM	4	4	4	4	4	4

P = PHYSICAL CONDITION INCLUDING ASSOCIATED DISEASES
U = UPPER EXTREMITIES
L = LOWER EXTREMITIES
S = SENSORY COMPONENTS (RELATING TO SPEECH, VISION, HEARING)
E = EXCRETION FUNCTION
C = MENTAL AND EMOTIONAL STATUS (CEREBRATION)

SCORE	S	M	WD
NORMAL	0	0	0
MAXIMUM	4	7	5

S = INDEPENDENCE IN SELF-CARE (A.D.L.)
M = MOBILITY
W = WORK (VOCATIONAL)
D = DOMESTIC ACTIVITIES

This denotes the organic state of the body and locomotor system creating the *physical disability*.

P: Physical condition including disease/disorder of the viscera (cardiovascular, pulmonary, gastrointestinal, urologic and endocrine) and cerebral disorders which are not enumerated in the lettered categoeis below.

0 : Normal or no gross abnormalities considering the age of the individual.

1 : Established disease/disorder which does not require medication or can be controlled by simply administered medication, not requiring medical or nursing supervision — e.g. mild diabetes or hypertension.

2 : Established disease/disorder which can be controlled with medical but requiring periodic medical or nursing supervision — e.g., diabetics on insulin therapy, labile hypertensives.

3 : Moderately severe disease/disorder requiring *frequent* medical and nursing supervision yet still permitting mobility.

4 : Severe disease/disorder requiring *constant* medical and nursing supervision confining individual to bed or wheel-chair.

U : Upper extremities, including shoulder girdle, cervical and upper thoracic spine.

0 : Normal or no gross abnormality considering the age of the individual.

1 : Minimal abnormality: Major Joint Range of Motion not less than75% of the full R.O.M. or average motor power not less than grade IV, or reduced co-ordination or sensation.

2 : Moderate abnormality: Major Joint Range of Motion 50 — 75 per cent, or average motor power grade III; or further reduced co-ordination or sensation evident only on specific clinical tests.

3 : Severe abnormality : Major Joint Range of Motion 25 — 50 per cent, or average motor power grade I — II; or further reduced co-ordination or sensation evident on inspection — e.g. ataxia of gait, trophic ulcers respectively.

4 : Complete motor paralysis; or sensory loss:
Gross incoordination or Joint Range of Motion 0 — 25 per cent.

L : Lower extremities, including the pelvis, lower thoracic and lumbosacral spine.

0 : Normal or no gross abnormality considering the age of the individual.

1 : Minimal abnormality; Major Joint Range of Motion not less than 75% of the full Range of Motion or average motor power not less than grade IV, or reduced co-ordination or sensation.

2 : Moderate abnormality : Major Joint Range of Motion 50 — 75 per cent or average motor power grade III; or further reduced co-ordination or sensation evident only on specific clinical tests.

3 : Severe abnormality: Major Joint Range of Motion 25 — 50 per cent average motor power grade I — II, or further reduced co-ordination or sensation clearly evident on inspection — e.g. ataxia of gait, trophic ulcers respectively.

4 : Complete motor paralysis or sensory loss.
Gross inco-ordination or Joint Range of Motion 0 — 25 per cent.

S : Sensory Components relating to speech, vision and hearing.

0 : Normal or no gross abnormalities considering the age of the individual.

1 : Minimal impairment, without causing sight or communication difficulties.

2 : Moderate impairment, causing mild sight or communication difficulties, correctable with use of aids and therapy.

3 : Severe impairment, difficult to correct.

4 : Complete loss of a sensory component.

E : Excretory function: — i.e. bowel and bladder control.

0 : Normal (spontaneous micturition) or no gross abnormalities considering the age of the individual.

1 : Occasional stress incontinence or nocturia, or complete control after bladder/bowel training.

2 : Has sensation to void but no immediate control.

3 : Periodic incontinence or retention alternating with control

4 : Total incontinence or complete loss of control of bladder/bowel performance.

C : Cerebration status:—

0 : Normal or no gross abnormalities considering the age of the individual.

1 : Minor deviations in mood, temperament and personality not impairing environmental adjustment.

2 : Decreased cerebration with poor motivation, mild confusion and disorientation.

3 : Moderately severe variations which can be controlled with therapy but require medical supervision.

4 : Severe variations requiring complete supervision.

II: Rehabilitation Profile (R.P.):— Table 2.

This denotes the functional state of the body and locomotor system arising out of physical disability and forming the handicap.

A.D.L. : The state of independence in self care activities or A.D.L. (Activities of Daily Living).

0 : Complete independence, without aids or appliances. Supervision only.

1 : Complete independence with the use of aids or appliances or requiring occasional help of another person with minimal assistance in one or two specific tasks.

2 : Partial dependence in the performance of some activities of daily living.

3 : Partial dependence in the performance of all activities of daily living.

4 : Complete dependence.

M : The mobility status : — i.e. ambulation, wheel-chair propulsion or bed-bound.

0 : Normal

1 : With the use of aids or appliances, can ambulate and manage steps without hand-rail and public transport. e.g. bus.

2 : With the use of aids or appliances, can ambulate and manage steps without hand-rail but *not* public transport.

3 : Independent ambulant on 1 level and can manage steps with handrail only.

4 : Ambulant on 1 level but requires minimal personal assistance.

5 : Ambulation with maximum personal assistance.

6 : Independent in wheel-chair mobility.

7 : Complete dependence in wheel-chair mobility or bedridden.

W : The work (employment) status or domestic activities status.

0 : Normal

1 : Modified work in open employment

2 : Production workshops — (competitive employment)

3 : Sheltered work.

4 : Home-bound employment

5 : Unable to work because of physical disability/handicap.

D : 0 : Normal

1 : Modified domestic activity with the use of aids/appliances and can cope with all household duties.

2 : Can cope with limited household duties only or needs occasional personal assistance.

3 : Can cope with limited household duties but needs full-time personal assistance.

4 : Complete dependence.

Analysis of Results

The tables illustrate the sex, age, ethnic group composition and clinical features of the 30 patients studied. The diagnosis i.e. cerebral thrombosis, cerebral haemorrhage was made by the referring medical unit (Table 2 — 6).

Table 2: NO. OF PATIENTS OBSERVED: 30

SEX	
Males	22
Females	8

Table 3: Age Groups of Patients

Age Groups (Years)	Number of Patients
40 — 44	1
45 — 49	3
50 — 54	5
55 — 59	4
60 — 64	7
65 — 69	4
70 — 74	5
75 — 79	1

Table 4: Ethnic Composition

Ethnic Groups	
Chinese	26
Indian	3
Malay	1

Table 5: Clinical Features of Patients

Clinical Features		
R	Hemiplegia	17
L	Hemiplegia	13
	Aphasia	10

Table 6: Diagnosis on Admission

Diagnosis	Number of Cases
Cerebral Thrombosis	25
Cerebral Haemorrhage	5

The duration of hospitalisation ranged from 4 weeks to 12 weeks. (average 7.5 weeks). This was taken from the time of admission of the acute stroke to the time of discharge from the D.R.M. Duration of treatment with Trental was taken from the time the drug was commenced in the DRM to the time of discharge; and this ranged from 2 weeks — 10 weeks. (average 4.8 weeks) — Table 7.

Table 7: Duration of Hospitalisation and Drug Treatment

Duration of hospitalisation (average)	7.5 weeks
Duration of treatment with Trental (average)	4.8 weeks

1. **Pre-Trental :** Prior to treatment with Trental, all the 30 patients showed signs of poor cerebration i.e. reduced mental activity, impaired concentration, sleep disturbances, dizziness, poor motivation, emotional lability and impaired memory, confusion and disorientation. These features were observed by the doctors and the staff and discussed at the assessment meetings. In all the 30 patients, these features were found to inhibit the active participation of the patients in the rehabilitation programme.

2. **Post-Trental :** Patients were assessed again on discharge and the profile coded. The analysis is a retrospective study of those patients who were treated with Trental. On discharge a clinical summary was made on a Rehabilitation card card which included, apart from clinical data, the report by each therapist concerned and a record of the profile (Table 8).

   In retrospect it was thus found that except for 3 patients, the remaining 27 showed significant improvement in the *degree of cerebration* and this affected the rehabilitation profiles (SM score) both in the aphasic and non-aphasic groups. There was no significant change, however, in the gross neuromotor/speech deficit (U.L.S. score). (Fig. 1).

The overall result was the achievement of greater independence in ambulation mobility with and without aids (quadrilateral walking stick) or appliances (short-leg brace on the affected limb).

Of the 3 patients that failed in rehabilitation, one case had the drug withdrawn after 4 weeks of therapy because of the development of a hypersensitive skin reaction. There was no conclusive evidence that this was due to Trental and the patient improved rapidly after the withdrawal of all medication.

Discussion:

In general, the drug was well tolerated without side effects. The significant improvement in cerebration after the administration of Trental coincided with the overall improvement in rehabilitation. This could well be due to the improved flow properties in areas of impaired cerebral vascular (arterial) circulation by increasing the oxygen transport in the capillary region. There was no significant effect however on the gross neuro-motor/speech deficit. From the rehabilitation point of view, it is of prime importance to obtain the full co-operation of the patient concerned, and this can only be done by improving the mental and emotional state of the stroke patient. From then on the objectives in rehabilitation can be achieved with less difficulty.

Conclusion:

In a group of 30 patients with cerebrovascular stroke and hemiplegia selected because of poor "cerebration", the use of Trental was observed to have significant effects in improving the overall mental state of the patients thus obtaining their maximum co-operation and active participation in the intensive rehabilitation programme.

REFERENCES

1. Millard, J.B.: Annual Report, 1972.
2. Moscowitz E., McCann, C.B.: Classification of disability in the chronically ill and aging, J. Chronic Dis. 5: 342-346, 1957.

Table 8: Summary of Patient Status

No	NAME	PROFILE ON ADMISSION	PROFILE ON DISCHARGE	DURATION OF HOSPITALISATION	DURATION OF TRENTAL	MOBILITY ON DISCHARGE
		ULS — C — SM	ULS — C — SM			
1	GRC	444 — 3 — 47	432 — 1 — 13	8 wks	6 wks	Ambulation with Q/S, SLB
2	WSG	440 — 2 — 37	430 — 0 — 13	6 wks	3 wks	Ambulation with Q/S, SLB
3	SYS	310 — 2 — 34	310 — 0 — 13	6 wks	4 wks	Ambulation with Q/S
4	HCM	444 — 3 — 47	432 — 1 — 14	12 wks	10 wks	Ambulation with Q/S
5	LHC	444 — 2 — 37	443 — 0 — 14	12 wks	4 wks	Ambulation with Q/S.
6.	GEK	433 — 2 — 35	432 — 0 — 13	10 wks	7 wks	Ambulation with Q/S.
7.	VP	330 — 2 — 35	220 — 0 — 13	8 wks	6 wks	Ambulation with walking frame
8.	CFK	440 — 3 — 35	444 — 1 — 24	10 wks	8 wks	Ambulation with Q/S.
9.	CSH	330 — 2 — 35	330 — 0 — 13	4 wks	3 wks	Ambulation with Q/S.
10	GKL	440 — 3 — 35	430 — 1 — 14	12 wks	4 wks	Ambulation with Q/S, SLB
11	KAK	440 — 3 — 47	440 — 3 — 47	8 wks	5 wks	Failed Rehabilitation
12.	TYK	320 — 2 — 35	310 — 1 — 13	4 wks	3 wks	Ambulation without aids.
13	HLS	440 — 1 — 35	430 — 0 — 13	8 wks	6 wks	Ambulation with Q/S, SLB
14.	GKS	440 — 1 — 35	420 — 0 — 13	6 wks	5 wks	Ambulation with Q/S, SLB
15	PBA	220 — 2 — 35	110 — 0 — 13	5 wks	3 wks	Ambulation with Q/S.
16	TMF	220 — 2 — 35	110 — 0 — 14	4 wks	3 wks	Ambulation with Q/S
17	KR	440 — 3 — 47	440 — 3 — 47	4 wks	2 wks	Failed Rehabilitation.
18	LSS	422 — 3 — 37	320 — 0 — 14	6 wks	4 wks	Ambulation with Q/S
19	LTM	440 — 2 — 34	430 — 0 — 13	4 wks	3 wks	Ambulation with Q/S
20	LTC	440 — 2 — 35	440 — 0 — 23	10 wks	4 wks	Ambulation with Q/S, SLB
21	OAC	443 — 3 — 47	432 — 1 — 14	12 wks	6 wks	Ambulation with Q/S.
22	PKS	444 — 2 — 35	433 —0 — 14	10 wks	6 wks	Ambulation with Q/S, SLB
23	PSH	440 — 2 — 37	430 — 0 — 25	12 wks	8 wks	Ambulant with maximum assistance + Q/S
24.	TGK	440 — 1 — 35	430 — 0 — 24	8 wks	4 wks	Ambulation with Q/S
25.	SCR	443 — 2 — 35	432 — 1 — 13	8 wks	6 wks	Ambulation with Q/S
26	WAS	440 — 2 — 34	440 — 0 — 13	5 wks	4 wks	Ambulant with W/S.
27	WFM	440 — 3 — 47	430 — 0 — 14	8 wks	6 wks	Ambulation with Q/S
28.	KTL	430 — 2 — 35	430 — 0 — 24	4 wks	3 wks	Ambulation with Q/S, SLB
29	WGK	440 — 2 — 37	440 — 0 — 24	6wks	3 wks	Ambulation with Q/S, SLB
30.	YTC	444 — 3 — 47	444 — 3 — 47	6 wks	4 wks	Failed Rehabilitation (Drug sensitivity)

AVERAGE (Non-Aphasic) 6.9 — 2.1 — 8 6		6 2 — 0 4 — 5 4	7 5 wks	4.8 wks
AVERAGE (Aphasic) 11 2 — 2 6 — 9 6		9 5 — 0 8 — 5 4		
	PRE-TRENTAL	POST-TRENTAL	HOSPITALISATION	TRENTAL
			AVERAGE DURATION	

Fig. 1: REHABILITATION PROFILE IN STROKE TREATED WITH TRENTAL