

A STUDY OF 136 CASES OF GENERAL PARALYSIS OF THE INSANE (DEMENTIA PARALYTICA) IN A MENTAL HOSPITAL

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SYNOPSIS

A study was made of 136 patients suffering from Dementia Paralytica admitted to Woodbridge Hospital, Singapore, during the period 1960 to 1970. The incidence of Dementia Paralytica was found to decline rapidly during the last 5 years.

The male to female ratio was 14 to 1, which was extremely high compared to those obtained in studies from other countries. The age ranged from 21 to 70. 70% of cases fell within the 40 to 59 age groups. There were more Malays and less Indians than expected. All the patients were from the lower social classes.

The main symptoms most frequently recorded were: aggressiveness, insomnia, wandering, grossly bizarre behaviour, noisiness and being naked. Slurring of speech was the most striking neurological sign. Pupillary abnormalities were noted in 44 cases. 15 patients had grand mal epileptic attacks which caused death in 3 patients.

The five most common modes of presentation were: dementia, acute confusional state, grandiose and paranoid states, and depression. In the hospital, they were much more disturbed than other patients. All were treated with penicillin 14 to 21 megas, which were repeated in 41 cases.

81% of cases had positive blood serology findings. A typical C.S.F. findings were: cell count—15 cu. mm.; protein content—80 mgm./100 cc.; globulin—positive; and V.D.R.L.—positive. The typical colloidal gold curve was 5554321000. 31 patients were still in the hospital; 46 patients had died in the wards; and 69 patients were discharged at the time of the study.

INTRODUCTION

This paper is, as far as the authors are aware, the only one of some size published in this region. This is a retrospective study of 136 patients suffering from Dementia Paralytica admitted and treated in Woodbridge Hospital during the period 1960 and 1970.

Dementia Paralytica will always have an interest for psychiatrists for it was the first major illness in the field of psychiatry once regarded as incurable but finally responded to medical treatment. An introduction to this subject will not be complete without a brief history concerning this illness.

History

The recognition of Dementia Paralytica as a clinical entity should be attributed to the French Psychiatrist, A. J. L. Bayle, who published his thesis in 1881 (Noyes, 1968). However, it was not until 1913 that the brilliant Noguchi working in

association with Moore in the Rockefeller Institute in New York was able to demonstrate the *Treponema Pallidum* in the brains of Paretics. In 1917, Wagner Jaureg of Vienna observed that artificial fever induced by inoculation with Malaria arrested the paretic process in patients and resulted in improvement. In 1950, Hanh *et al* (1959) found that early diagnosis and prompt treatment with penicillin resulted in good clinical improvement and very rare death from this illness and thus revolutionized the treatment of Syphilis.

Method of Study

The clinical records of all patients admitted into Woodbridge Hospital from 1960 to 1970 were examined and those found suffering from Dementia Paralytica were selected for study. Woodbridge Hospital is the only mental hospital in Singapore which has a population of about two million in 1970.

Incidence

At one time Dementia Paralytica accounted for 5 to 15% of the admission rate to mental hospitals up until 1917. The wards of every mental hospital were crowded with them (Batchelor, 1969). However, during the period of survey,

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1960 to 1970, the total number of cases collected in this study represented only 0.8% of the total number of new admissions in Woodbridge Hospital.

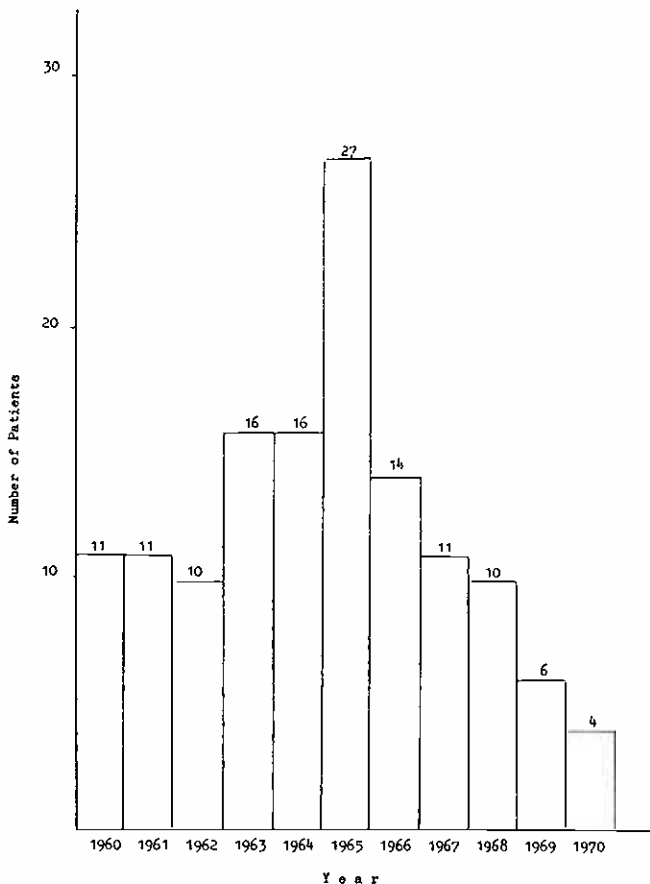


Fig. 1.

Diagram showing the annual admission rate of patients suffering from Dementia Paralytica between 1960 to 1970 in Woodbridge Hospital, Singapore.

From Fig. 1, it could be observed that there was an increase of the number of admissions per annum after the year 1962. This increase might not be due to an actual increase of the incidence of Dementia Paralytic in Singapore but rather to an increase in awareness by the doctors of this condition in the hospital. The rise reached a peak in the year 1965 (27 admissions) after which the incidence fell steadily to a minimum low of 4 admissions per annum in the year 1970. This present study thereby illustrated a rapid decline in the number of admissions of Dementia Paralytica during the last five years in the hospital.

A parallel trend was also noted in the records obtained from Middle Road Hospital (the only venereal disease hospital in Singapore) concerning primary and secondary syphilis. These records showed an increase in incidence from the year 1945 reaching a peak in the years 1948 and 1949, followed by a similar sharp decline. Thus, it could be seen that a peak incidence of Dementia

Paralytica occurred 16 to 17 years after the zenith of primary syphilis which was longer than the 11 years found by Dewhurst (1969) in England.

GENERAL CHARACTERISTICS OF PATIENTS

Age and Sex

TABLE I

Age of Admission	Male	Female	Total
20 - 29	4	—	4
30 - 39	19	1	20
40 - 49	50	3	53
50 - 59	39	4	43
60 - 69	13	1	14
70 and over	1	—	1
Unknown	1	—	1
TOTAL	127	9	136

Age of admission to hospital.

As could be observed from Table I, the ages on admission of patients in this series ranged from 21 to 70 with a mean of 46.8. The two youngest patients were aged 21 and 25 years, both presenting a clinical picture indistinguishable from schizophrenia. About 70% of the patients fell within the age groups of 40 to 59.

There were 127 males and 9 females giving a sex ratio of 14 to 1. The sex ratio obtained from Middle Road Hospital concerning primary syphilis for the years 1946 to 1955 was only 5.5 to 1. The sex ratio obtained in this study was extremely high when compared to those obtained from studies in other countries. Orban (1957) in Budapest and Dewhurst (1969) in England reported a sex ratio of 2.1 to 1. Hahn *et al* (1959) in America and Froshaug and Ytrehus (1956) in Oslo found

Ethnic Group

TABLE II

Ethnic Group	No. of Patients	%	Population of Singapore %	Woodbridge Hospital %
Chinese	117	86.0	74.2	77.0
Malays*	15	11.1	14.6	7.8
Indians†	4	2.9	8.1	13.6
Others	0	0.0	3.1	1.6
TOTAL	136	100.0	100.0	100.0

A breakdown of the patients into their ethnic group.

*Include Javanese.

†Include Pakistanis and Ceylonese.

a sex ratio of 3 to 1. Lui (1960) in Peking reported a sex ratio of 4.4 to 1. Hare (1959) suggested that the recent decrease in sex ratio of men to women in the United Kingdom might be a result of alteration in sexual behaviour of women following an increase of their emancipation.

As observed in Table II, the Indians were markedly under-represented. In Singapore, the Indians were more receptive to the idea of seeking western medical treatment than either the Chinese or the Malays. This could account for the low incidence of Dementia Paralytica which was a complication of untreated or partially treated syphilis. The reverse was true for the Malays which had a comparatively higher incidence than expected.

Social Status and Occupations

An analysis of social status revealed that all patients were from the lower social classes. There were 35 patients whose occupations were unknown and most of them were brought to the hospital by the police without their relatives. 28 patients were unemployed. Of the 73 patients with known occupations, there were 4 skilled (clerks), 34 semi-skilled and 35 unskilled workers. The concentration of patients at the lower social classes was probably due to ignorance or failure to seek early medical treatment and indifference to good health amongst these people.

In the occupational analysis of the patients, it was interesting to note that there were 11 drivers of motor-vehicles (6 taxi-drivers), 6 hawkers, 4 seamen, 3 trishaw riders and 2 of each of the following occupations: barmen, cobblers, carpenters and farmers. Some of these occupations were potentially dangerous for the patients and fortunately many had their jobs prematurely terminated before severe deterioration of their conditions set in.

CLINICAL FEATURES

Duration of Symptoms Before Admission

	No. of Patients
Under 4 weeks	28
1 to 6 months	37
6 months to 1 year	18
More than 1 year	3
No record	50

As observed from above, of the 86 patients, 65 (76% of cases) had their symptoms less than 6 months before admission into the hospital.

Presentations at the Time of Admission

75 patients were brought by their relatives to the hospital for treatment. Table III showed some of the disturbed behaviours exhibited by the patients as reported by their relatives. Many of these disturbed behaviours of the patients were caused by the rapidly developing dementia resulting in memory impairment, poor judgement, disorientation and disinhibition.

TABLE III

	No. of Patients
Aggressive behaviour towards relatives and others - - -	33
Not sleeping at night and causing disturbances - - -	29
Wandering aimlessly and getting lost	26
Grossly bizzare behaviour e.g. burning paper inside the house at night	24
Deterioration of personal habits (neglect personal hygiene, incontinence of urine and faeces, eating rubbish) - - -	18
Noisy behaviour (including shouting and using vulgar language) -	15
Suicidal attempts (possibly due to confusion: 2 patients jumped out of taxi) - - -	13
Theft of inexpensive objects - -	6
Childish behaviour, excessive spending and giving, borrowing, and moving - - -	1 to 4 each

The disturbed behaviours of patients.

Hearing of voices, a very common symptom of severe psychotics was relatively uncommon in Dementia Paralytica and was found in 17 patients. 5 patients also had visual hallucinations.

Other Sources of Admission

Police were involved in 33 cases for wandering, disturbed and noisy behaviour, obstructing traffic, thefts, indecent exposure and suicidal attempts. One patient made a complaint to the police saying that people were persecuting him.

28 patients were treated initially in medical, surgical and venereal disease hospitals before being referred to Woodbridge Hospital because they were unmanageable in the respective hospitals.

Clinical Syndromes

Although there was considerable overlap, because many patients had features of more than one syndrome, it was possible to divide the cases into the following syndromes:

TABLE IV

	Illustrative Cases	No. of Patients	%
Simple dementia	Case 2	61	45
Acute confusional state	Case 3	32	24
Grandiose form	Case 3	15	11
Paranoid state	—	13	10
Depressive state	Case 4	9	6
Schizophrenia	—	2	4
Catatonia	—	2	
Tabo-paresis	—	2	

Types of Dementia Paralytica.

The type of syndromes presented on admission depended on the age of patients, the severity and stage of the illness, and the pre-morbid personality and past experiences of the patients. The positive features of the illness e.g. paranoid delusion, grandiose delusion, depression and hallucination, usually disappeared after short periods (weeks or months) to give a picture of apathetic dementia which was always found in the background of all the above syndromes. Often the presence of positive psychotic symptoms also depended on the availability of relatives to give a comprehensive history and to the amount of attention and observation given to the patients.

From Table IV, it could be observed that simple dementia was the most common type of presentation found. Hahn *et al* (1959) and Froshaug and Ytrehus (1956) had similar findings. In this study only 11% of cases expressed grandiose delusion, which was very low when compared with Liu (1960) in Peking—39% and Varma (1952) in India—57.5%. The low percentage of grandiose delusion in patients observed in this study might be related to the low social status of the patients. Lucas, Sainsbury and Collins believed that grandiose delusion occurred more frequently in members of the higher social groups.

Neurological Examination

It was unfortunate that complete neurological examinations were not done in all the cases seen. Most of the patients were un-cooperative. The most striking sign was slurring of speech which was said to be highly characteristic of Dementia Paralytica (Brain, 1962). Pupil abnormalities were

noted in 44 cases, mainly irregular pupils not re-acting to light—this was a good confirmatory sign. 4 cases had optic atrophy. Rissl's reflexes were noted to be positive in 20 cases. The other reflexes were shown in Table V.

TABLE V

	Brisk	Present	Sluggish	Absent
Knee jerks	12 cases	48 cases	4 cases	21 cases
Ankle jerks	5 cases	27 cases	5 cases	29 cases
Plantar reflex: ↓/↓-74 cases; ↑/↑-4 cases; ↑/↓-3 cases				

We would have to conclude that more neurological abnormal signs could have been detected if the neurological examinations of all the cases had been more complete and thorough. Other interesting neurological syndromes probably also of syphilitic origin found to be associated with Dementia Paralytica were: Parkinsonism—1 case; Hemi-chorea—1 case; and Cerebellar ataxia—1 case.

Diagnosis

In most cases, given a good history by the relatives and with thorough psychiatric and neurological examinations, an early clinical diagnosis of illness could be made, to be confirmed only by positive blood and C.S.F. findings.

A history of wandering and losing one's way, disturbed or aggressive behaviour, stripping naked, erratic or abnormal behaviours e.g. burning paper inside the house, gross neglect of habits and loss of social sentiments, especially if they were of recent onset (one to six months), indicated rapidly developing dementia or cerebral degeneration. The diagnosis was obvious if the patient spoke with a slurring normally tested by the inability to pronounce tongue twister like 'British Constitution' in the English speaking patients. Apart for positive symptoms like grandiose or paranoid delusions, there was varying degree of memory impairment and disorientation. The more severely demented patients could not even recognise their relatives or differentiate night from day.

LABORATORY FINDINGS

Blood Serology

Of the 124 cases recorded, the blood V.D.R.L. was positive in 101 cases, doubtful in 15 cases and negative in 5 cases. Thus the V.D.R.L. was positive in only 81% of cases examined. In two of the 5 cases where the V.D.R.L. was negative, the blood Kahn Test was positive.

Cerebrospiral Fluid Findings

In most cases a characteristic C.S.F. picture was present. The abnormalities consisted of an increase in cells, elevation of total proteins, presence of globulin, a first zone colloidal gold curve (paretic curve) and a positive V.D.R.L.

TABLE VI

No. of Cells cu./mm.	Cases	mgm. Protein per 100 cc.	Cases
0 - 5	39	0 - 40	18
6 - 20	55	41 - 60	25
21 - 50	16	60 - 100	55
51 - 100	5	101 - 200	19
Over 100	4	201 and above	3

From Table VI, it could be seen that in 67% of cases the cell count exceeded 5 cells per cu. mm. and in 85% of cases the protein content was above 40 mgm. per 100 cc. Also presence of globulin was found in 85% of cases (positive in 89 cases; traces in 6 cases; and negative in 10 cases). V.D.R.L. was positive in 105 cases and negative in 6 cases.

TABLE VII

1st, 2nd, 3rd or 4th Readings Only of Colloidal Gold Curve	No. of Cases
55555	3
5555	29
555	41
55	13
5	7
4444	1
444	4
44	3
4	2
3333	1
333	1
33	2
TOTAL	107

A breakdown of the results of colloidal gold curve.

Typically, the Lange's colloidal gold curve was of paretic type, e.g. 5554321000 or even 5555543110 or 5432100000. Sometimes though the curve remained of this type, precipitation was not quite complete and the highest figures were 4 or even 3 (Brain, 1962). In 6 cases, the curves were non-paretic: 2332100000 (2 cases); 1233321000 (3 cases) and 0122100000 (1 case).

In the Wards

A follow-up observation in the wards showed that the patients were much more disturbed than the other patients. During the first week or month, they had a great tendency to abscond repeatedly. They were also more prone to get involved in fights with other patients because of symptoms caused by loss of inhibitions and restraint e.g. throwing water at others, hitting others with broom-sticks. At a later stage of their stays in the hospital, they were very prone to falls or knocking their heads. Some of these falls were mainly due to unsteady gaits and weakness of lower limbs and occasionally due to epileptic attacks.

Epilepsy and Apoplexy

15 patients were observed to have grand mal epileptic attacks during their stays in the hospital. 2 patients died after the attacks and 1 died of status epilepticus. There were 6 cases of apoplexy, two developing left hemi-paresis and one subarachnoid haemorrhage.

Other Associated Illness

Pulmonary tuberculosis appeared to be a common illness found in patients with Dementia Paralytica. Of the 75 cases with records of X-ray chest, the following incidence of pulmonary tuberculosis was recorded as shown in Table VIII below.

TABLE VIII

	No. of Patients	%
Normal chest X-ray	31	41.5
Scar or inactive	27	36.0
Receiving anti-T.B. drugs	13	17.0
Sputum positive for acid-fast bacteria	4	5.5
TOTAL	75	100.0

X-ray result of patients.

Treatment

All patients received 14 mega, 21 mega or more per course of penicillin. Some of the patients received more than one course of penicillin as shown in Table IX.

Changes in C.S.F. After Treatment

The results obtained were based on 30 cases. Cell count returned to normal by 16 weeks and remained normal. Protein content responded more promptly in this study and returned to normal after 12 weeks in most cases. However,

TABLE IX

No. of Courses	No. of Patients
1 course	105
2 courses	21
3 courses	3
4 courses	3
Many courses	4
TOTAL	136

there were 2 cases which remained abnormal at 60 mgm./100 cc. and 55 mgm./100 cc., up to 7 and 11 months after treatment respectively. The V.D.R.L., K.T. and W.R. reverted more slowly and might remain positive 2 to 3 years after treatment. The colloidal gold curve did not show much change during the first 3 months. It might even show a greater abnormality e.g. 5554321000 to 5555431000. It then dropped rapidly during the 7th and the 12th month and reverted to normal after 3 to 6 years. On one occasion, however, it remained unchange at 5554321100 up to the 6th year. According to Ambrose King (1966), the Wasserman reaction and colloidal gold tests improved more slowly and might show positive change for an indefinite period.

Follow-up and Outcome of Patients

At the time of study, 31 patients were found still in the hospital, 46 patients had died in the wards and 69 were discharged from the hospital. The average stay of patients still in the hospital was 5½ years with a range of 2 months to 10 years. Most of them were quiet, keeping to themselves and demented, but able to look after themselves. A few of them helped a little in looking after the wards. 3 patients were however found to be still very aggressive and disturbed, and 4 patients had to be fed and bathed.

46 patients died in the hospital. Their stays in the hospital before death ranged from 5 days to 8½ years with a mean of 2½ years. The common causes of death were: pneumonia, cardio-vascular failure, diarrhoea, amoebic dysentery, epilepsy, apoplexy, falls and infections. Of the 69 patients discharged from the hospital, there was difficulty in tracing many of them. The general impression obtained was that once the patients had to be admitted into the hospital for in-patient treatment, they were invariably incapacitated and disabled. On discharge from hospital many of them, though less disturbed, were still demented and had to be supported and looked after by their relatives.

Most of them were dismissed from or unable to carry on with their previous jobs because of inefficiency.

INTRODUCTION TO THE CASES

It would be noticed from the sample of cases studied below that the earliest change in this malady was a change of personality consisting mainly of emergence of the less desirable qualities which had hitherto been repressed e.g. aggressiveness, lack of concern, and callousness which might be accompanied by a depressive reaction (due to partial retention of insight). In some predisposed patients paranoid delusions and hallucinations might develop (Boestroem, 1929) and in others, grandiose ideas appeared usually inter-mingled with early signs of dementia characterised by poor memory for recent events, poor concentration and judgement, and acute confusion. During the illness most patients were very disturbed and aggressive, caused partly by active cerebral irritation or selective cerebral degeneration. As the disease progressed the dementia would become more marked and the patients were more apathetic and finally lapsed into a vegetative state, ending with pneumonia or heart failure.

Case 1

This case illustrated mild dementia and a change of personality in a patient suffering from G.P.I.

A 37 year-old male Chinese clerk, with a secondary English education was referred by his company doctor for admission because of a recent change of character. He was inefficient in his work, irregular in his office hours and absent from work for the last 6 days before admission. He would also not pay for his meals.

In the hospital, he burnt the ward-mattress with cigarette-butts. When questioned about his actions, he said that he thought he could go home if he did that. He was unkempt and indifferent. His blood V.D.R.L. was negative. A diagnosis of depression was made and he was treated with anti-depressants and sent home.

On discharge, he still refused to work. His wife then noticed further marked change in his personality and his behaviour e.g. he would beat his children; throw clothes, shoes and food into the dustbin; keep his salary to himself and increase his drinking habits (beer). He was re-admitted into the hospital after an attempt to hang himself in front of his wife. His blood V.D.R.L. was repeated and was found to be positive.

Case 2

This case illustrated gross 'simple dementia'.

A 52 year-old male Chinese with no formal education, worked as a rubber-tapper. At the age of 32, he went to Christmas Island and became a lorry-driver. Five months prior to admission, after driving his car into the drain, he was noticed to be mentally unwell. He would wander away from home aimlessly, grab at food during meal and neglect his children.

When examined in hospital, he was discovered to be severely demented, confused and disorientated. He said that he had been in the hospital for 50 years and was still working as a driver. He could not recognise the nurses and claimed that they were his friends. The positive neurological signs were dysarthria (slurring of speech), tremors of lips and hands, positive—Rissl's and grasp reflexes and a broad based gait.

Case 3

This case illustrated a patient with a mixed clinical picture of acute confusion, grandiose delusions and mild dementia.

A 56 year-old widowed Chinese, worked as a clerk in an engineering firm for 30 years. He was described as a hot-tempered, worrying but friendly type who had many friends.

One month prior to admission, he was absent from work for no reason. Two weeks later, he became forgetful, walked about naked and played with electric switches. He became very irritable, laughing and talking to himself and shouting. He would go shopping and take things by force from the shops without paying for them. He knocked at strangers' doors inviting them to dinners saying that he had won a lottery of \$30,000. He would pray to the gods for his good fortune and also claimed to see spirits and gods.

When interviewed, he said that he had come to the hospital for a 'check-up' of his health because he was suffering from giddiness (lacking insight). In between answers, he was found to be laughing inconsistently. He claimed that he had an estate, a godown and had won a lottery of \$8,000 the day before and wanted to spend his money for all.

Case 4

This patient presented with a picture of a typical depression with suicidal attempt. His subsequent behaviour, however, revealed the true nature of his illness.

A 50 year-old Chinese who had no formal education, was a taxi-driver until 2 years ago.

He was referred by a general practitioner because of a history of abnormal behaviour for the last 2 years. His complaints were headache, body-aches and insomnia. He was also observed to talk and laugh to himself and scold others for no apparent reason. One month before admission, he attempted to hang himself but was discovered 'in the nick of time' by his wife. He said he was depressed and wanted to die because he could not sleep.

After 10 days in the ward, he was observed to wander about aimlessly and to strip himself. Slurring of speech was then noted. Blood and C.S.F. findings confirmed the diagnosis of G.P.I.

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