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CLINICAL ARTICLES

NEUROSYPHILIS

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The other day one of the members of the hospital visiting committee, a renowned physician of the city, a doyen of the medical profession expressed his doubt about the incidence of neurosyphilis now a days and commented that he had not come across a single case of tabes dorsalis during his last ten years practice. His comments stimulated us to look into our records of neurosyphilis treated as inpatients during the last few years. 2776 patients were admitted in V. D. indoor during the period 1960–67. Of them 161 (5.8 percent) were found to have neurosyphilis. All the cases included in this study belonged to the group of late syphilis, acquired and congenital.

The diagnosis was based on historical, clinical, laboratory and therapeutic grounds. Blood VDRL was done in all and spinal fluid was examined in most of them. The cell count above 5 per cmm and protein above 40 mgm percent were considered abnormal. Colloidal gold test was not done due to lack of facilities. VDRL of spinal fluid was done as a routine. Other investigations such as skiagram of heart and aorta, electro-cardiogram, skiagram of bones and joints etc were done wherever possible and necessary to detect other concurrent syphilitic lesions.

The aim of the present study is to find out an answer to an often expressed doubt and complacency and to collect as much information as possible regarding present features of different neurosyphilitic conditions after more than 20 years of syphilotherapy with penicillin in our country.

Only one retinochoroditis and two cerebral meningeal cases were due to late congenital syphilis.

From the above table it appears that cerebral syphilis was present in 93, spinal in 60 and mixed in 4.

The asymptomatic cases were without any clinical neurological lesions and were diagnosed during routine examination of spinal fluid in seroreactive cases more than two years after infection.

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TABLE-1

Shows number and types of neurosyphilis

Total	Asymptomatic	Symptomatic	
161	4	157	
		(A) Parenchymatous – 120	(B) Meningovascular – 37
		Cerebral – 10	(a) Vascular – 9
		(Dementia paralytica)	Cerebral – 6
			(Hemiplegia)
		Spinal – 43	Spinal – 3
		(Tabes Dorsalis)	(Transverse myelitis)
		Mixed – 4	(b) Meningeal – 15
		(Taboparesis – 1	Cerebral – 14
		Amyotrophy – 3)	(Cranial nerve)
		Ocular – 63	Spinal – 1
		(Optic atrophy – 44	(c) Mixed – 13
		Optic neuritis – 2	Spinal – 13
		Retinochoroiditis-17	(Meningovascular)

TABLE-2

Shows different age groups

Age group	No. of cases		Age group	No. of cases	
15–20 yrs	1		41–45 yrs	30	51
21–25 yrs	3	21	46–50 yrs	21	
26–30 yrs	18		61–55 yrs	14	20
31–35 yrs	18	64	56–60 yrs	6	
36–40 yrs	46		61–65 yrs	3	4
			66–70 yrs	1	

115 (71.4 percent) were found between 31 and 40 yrs. and 22 (13.7 percent) were 30 or below.

TABLE 3

Shown details of asymptomatic cases

Age	Marital status	Positive anamnesis	Duration of infection	Blood and spinal fluid
Min – 28 yrs	Married – 3	4	Min – 3 yrs	Both
Max – 40 yrs	Single – 1		Max – 20 yrs	reactive – 4
Mean – 35.7 yrs			Mean – 12.7 yrs	

All of them were hindus and none had any anti luetic treatment before diagnosis.

TABLE 4

Shown details of parenchymatous cases

Clinical	Age	Positive anamnesis	Duration of infection at the time of diagnosis	Blood and spinal fluid
Dementia Paralytica 10	Min – 35 yrs Max – 46 yrs Mean – 42.2 yrs	8	Min – 6 yrs Max – 18 yrs Mean – 14.2 yrs	Both reactive – 10 Type – III
Tabes Dorsalis 43	Min – 30 yrs Max – 67 yrs Mean – 42.3 yrs	42	Min – 3 yrs Max – 45 yrs Mean – 17 yrs	Both reactive–10 Both non-reactiev –1 Blood only –32
Taboparesis 1	45 yrs	1	15 yrs	Blood only –1
Amyotrophy 3	Min – 40 yrs Max – 55 yrs Mean – 44 yrs	3	Min – 7 yrs Max – 35 yrs Mean– 17.6 yrs	Both reactive–2 Blood only –1
Optic atrophy 44	Min – 25 yrs Max – 65 yrs Mean – 42 yrs	38	Min – 3 yrs Max – 30 yrs Mean– 14.5 yrs	Both reactive–9 Blood only –35
Optic neuritis 2	Min – 40 yrs Max – 45 yrs Mean – 42.5 yrs	1	—	Blood only –2
Retino choroiditis 17	Min – 15 yrs Max – 56 yrs Mean – 40 yrs	16	Min – 5 yrs Max – 30 yrs Mean – 17.6 yrs	Both reactive–3 Blood only –14

110 were hindus and 10 were muslims. 96 were married 22 were single and 2 widower. 51 had had inadquate tretment.

Of the paretics 6 were in early stage. 12 (30 percent) cases of tabes exhibited primary optic atrophy, both eyes in 11 and in 1 right eye only. 40 cases showed primary optic atrophy of both eyes, left eye only in 3 and right eye only in 1. Both the eyes were involved in optic neuritis and retinochoroditis cases. The youngest of the retinochoroiditis group was a case of late congenital syphilis who had positive maternal anamnesis.

TABLE 5

Shows details of meningovascular cases

Clinical	Age	Positive anamenesis	Duration of infection at the time of diagnosis	Blood and spinal fluid
Vascular 9	Min – 26 yrs Max – 58 yrs Mean – 43.4 yrs	8	Min – 4 yrs Max – 35 yrs Mean – 16.7 yrs	Blood only reactive –9
Meningeal 15	Min – 22 yrs Max – 51 yrs Mean – 35.4 yrs	12	Min – 3 yrs Max – 15 yrs Mean – 7.5 yrs	Both reactive–3 Blood only –12
Mixed 13	Min – 26 yrs Max – 52 yrs Mean – 40 yrs	10	Min – 8 yrs Max – 22 yrs Mean – 14 yrs	Blood only –13
37		30		

34 were hindus and 3 were muslims. 25 were married and 11 were single. 11 had inadequate treatment.

Of the vascular group 6 had motor hemiplegia, 4 in the left and 2 in the right side. The other three had transverse myelitis in the lower dorsal region.

The chief manifestation of the meningeal group was cranial nerve palsy.

TABLE 6

Shows involvement of different cranial nerves

Cranial nerve invloved	No. of cases
II and VII right infranuclear	1
III right	1
V bilateral	1
VI bilateral	1
right	2
VII left supranuclear	1
infranuclear	3
right supranuclear	2
VIII bilateral	2
	14

The patients with 8th cranial nerve involvement were late congenital syphilitics with positive maternal anamnesis.

The only case of spinal meningeal involvement was probably that of radiculitis resulting in left foot drop with paresthesia of three months duration in a young boy of 18 years. He had no anamnesis, no evidence of congenital syphilis, reactive blood VDRL 8 dils and normal spinal fluid. His improvement with antiluetic treatment was dramatic.

The chief clinical feature of the spinal meningovascular type was that of chronic spastic paraplegia due to involvement of lower dorsal and lumbar segments.

TABLE 7

Shows number of cases with details of serological status

Clinical	Nonre-active	Blood VDRL Reactive							
		Neatserum			Dilutions				
			4	8	16	32	64	128	Total
Asymptomatic		1	1		2				4
Dementia		3	1			2	3	1	10
Tabes	1	35	2		4	1			43
Taboparesis		1							1
Amyotrophy		2			1				3
Optic atrophy		24	1	9	3	4	3		44
Optic neuritis		1					1		2
Retinochoroiditis		13		2		1	1		17
Vascular Cerebral		5	1						6
Spinal		3							3
Meningeal Cerebral		10			3	1			14
Spinal				1					1
Meningovascular		11	1	1					13
	1	109	7	13	13	9	8	1	161

TABLE 8

Shows spinal fluid changes

Clinical	Normal	Cell only	Protein only	Cell & Protein	Cell & VDRL	Protein & VDRL	Cell Protain & VDRL	VDRL only	Total
Asymptomatic					2		2		4
Dementia							10		10
Tabes	11	1	17	4		3	4	3	43
Taboparesis	1								1
Amyotrophy						1	1		2
Optic atrophy	14	2	13	5		3	4	2	43
Optic neuritis			2						2
Retinochoroiditis	6		4	3		1		2	16
Meningeal Cerebral	7	1		2	1			2	13
Spinal	1								1
Vascular Cerebral	2	1	1						4
Spinal	1								1
Meningovascular	7	1	4	1					13
	50	6	41	15	3	8	21	9	153

All were nonmotensive with clear fluid. No abnormality was found in 50. Cells were increased in 45, protein in 86 and VDRL was reactive in 41.

TABLE 9

Shows relation between blood serology and spinal fluid in different types of neurosyphilis

Clinical	Reactive VDRL in blood & spinal fluid	Reactive VDRL in blood only	Reactive VDRL in spinal fluid only	Nonreactive in both
Asymptomatic	4	—	—	—
Dementia	10	—	—	—
Tabes	10	32	—	1
Taboparesis	—	1	—	—
Amyotrophy	2	—	—	—
Optic atrophy	9	34	—	—
Optic Neuritis	—	2	—	—
Retinochorciditis	3	13	—	—
Meningeal Cerebral	3	10	—	—
Spinal	—	1	—	—
Vascular Cerebral	—	4	—	—
Spinal	—	1	—	—
Meningovascular	—	13	—	—
	41	111	—	1

Spinal fluid study could not be done in 8 cases.

So far the records go, none had cardiovascular and/or any other visceral involvement. In only one late congenital, involvement of bones and cartilages of nasal architecture was noticed.

Trichomonas urethritis with stricture urethra was found in a case of spinal meningomyelitis.

The mainstay of treatment was penicillin which was supported by various combination of vitamin B^1, Vitamin B^{12}, fever therapy and steroids. Vitamin A was also added in fairly high dose in some of the optic atrophy cases.

Inj. crystalline penicillin G was given 1 lac unit intramuscularly four hourly round the clock. A total dose of 10 megaunits was considered minimum. Full therapeutic dose of steroid for at least 10 days followed by tailing was considered adequate.

TABLE 9

Shows number of cases with treatment and results

Clinical	Penicillin	Penicillin & fever	Penicillin & steroid	Other antibiotics	Cured or markedly improved	Slight to moderate improvement	No. improvement
Asymptomatic	4				4		
Dementia	3	2	3			6	2
Tabes	26	1	9	3	2	26	12
Taboparesis	1					1	
Amyotrophy	2		1			3	
Optic atrophy	23	2	11	8		29	15
Optic neuritis			2			2	
Retinochoroiditis	14		3			14	3
Vascular	4		4			8	
Meningeal	12		3		6	9	
Meningovascular	6		3			6	3
	95	5	39	11	12	103	35

Tetracycline or chloramphenicol was given mainly to penicillin sensitive cases and in a few cases of optic atrophy to compare the results with penicillin. Plain tetracyclin was administered in 4, Terramycin in 3 and Chloramphenicol in 4. The schedule was 2 G a day in four equal divided doses for 12 to 16 days. Our impression is that they are equally effective as penicillin in syphilis.

Excluded in this study was a case of parkinsonism of paralysis agitans type in a married hindu of 46 years with positive anamnesis, reactive serology and normal spinal fluid. Whether syphilis was the etiologic factor or a concommitant one was difficult to establish.

In addition there were 8 more cases who came with some vague neurological symptoms without any difinite clinical finding, positive anamnesis, reactive serology with normal spinal fluid but all of them improved moderately with antiluetic treatment.

DISCUSSION

The present study has lost much of its representative character as it does not include all the neurosyphilis cases both male and female seen in the department during the period 1960 67 due to inadequate data. The working principle is to admit all clinical neurosyphilis cases for investigation and treatment and to examine the spinal fluid in cases with reactive blood with or without any other late manifestation to exclude neurosyphilis. Though we could not admit the female cases for lac of provisions, it it a fact that we came across only a few of them during the entire period of study contrary to what Rajam (1950) found, 1 in every 12 male in a series of 850. The male cases who could not be admitted due to various reasons comprise not less than 25 percent of the total cases under study. Most of them were the cases of optic atrophy, complete or in fairly advanced stage.

No difference in incidence was found between hindus and muslims. The incidence ratio between married and single persons was found to be 4:1 in the parenchymatous and 2.5:1 in meningo–vascular group.

Anamnesis was present in 119 (75 percent). The mean duration of infection at the time of diagnosis was maximum in retinochoroiditis and amyotrophy (17.6 years) and minimum in the meningeal form (7.5 years).

The mean ages of the parenchymatous and meningovascular groups were 42.57 years and 39.6 years respectively. It is worth noting that 22 (13.7 percent) were 30 or below.

TABLE 10

Shows the mean duration of infection and mean ages in comparison to Oslo study (Rajam, 1956).

	Mean age at recognition		Mean duration of infection.	
	Oslostudy	Presentstudy	Oslostudy	Presentstudy
Meningovascular	37.5 yrs	39.6 yrs	15.1 yrs	12.7 yrs
General paresis	52.5 yrs	42.2 yrs	25.6 yrs	14.2 yrs
Tabes dorsalis	60.8 yrs	42.3 yrs	29.2 yrs	17 yrs

The above table shows that the mean age at the time of infection varies between 25.2 yrs to 28 yrs in the present study against 22.4 yrs to 31.6 yrs in Oslo study.

Inadquate treatment in 62 could not prevent development of neurosyphilis and does not appear to have any effect on the production of precocious neurosyphilis.

During the above period not a single case of clinical early neurosyphilis was admitted. Spinal fluid examination in 100 acquired early syphilis showed abnormalities in 23, increased cell in 7, protein in 11, both cell and protein in 3 and reactive compliment fixation of precipitation test in 2 (Datta, 1968).

Out of 9277 cases of syphilis seen between 1960–67, 4611 were late, which includes latent and late symptomatic. The present study shows that at least 4 of them were having asymptomatic and 157 were symptomatic neurosyphilis of which only three were congenital syphilitics. The actual incidence will be 25 percent higher i. e. about 5 percent of the total late cases which appears to be lower than what reported before. Incidence as high as 39 percent in white males and 22 percent in white females, 16 percent in coloured males and 7 percent in coloured females has been recorded by Turner (quoted by Merrit, 1259) in a series of 10000 cases. Merrit et al (1946) found 29 percent neurosyphilis of 2263 syphilis cases, examined clinically and serologically including spinal fluid after secondary stage. Nielson, (Quoted by Rajam, 1956) found 8.6 percent out of 467 male patients.

The incidence of asymptomatic variety in this series is far below the real as spinal fluid examination was only possible in limited number of cases. Merrit et al (1946) found 30 percent asymptomatic neurosyphilis in a series of 676 among 2263 consecutive cases. Thomson (1955) found 12.8 percent in 1570 males and 6 percent in 251 female latent syphilis. Approximate percentage of asymptomatic variety among different types of neurosyphilis is considered to be 30 percent by King and Nicol (1964).

In the present series parenchymatous involvement was found in 120 (75 percent). Rajam (1955) found late parenchymatous lesion not so common in India as in western countries. In India involvement of neuroaxis was found predominenty to be of meningeal and meningovascular type particularly affecting the spinal cord comprising 3 to 5 percent of total syphilitic admission Rajam, (1955). Brain (1962) has mentioned that out of 12 cases, 8 are parenchymatous (paresis and tabes) and 4 are meningovascular. In a series of 676 cases Merrit et al (1946) found about 45 percent parenchymatous, 30 percent asymptomatic and rest were all the other forms. Girard et al (1959) found tabes and paresis in 209 out of 6200 in 1934–45 and 151 among 8643 during 1946–58. King and Nicol (1964) consider parenchymatous involvement in about 60 percent, 15 percent cerebral and 45 percent spinal. Low incidence of parenchymatous lesions in India was considered by many due to racial variation and various febrile conditions specially malaria. Parenchymatous involvement as high as 75 percent in a series of 161 probably the highest so far reported in India. Can this be the result of control of malaria and/or increased nutritional deficiency?

The present study shows 93 (60 percent) cerebral, 60 (38.2 percent) spinal and 4 combined neurosyphilis. Rao (1954) found 15 spinal and 16 cerebral in a series of 31 cases which did not include a single case of paresis or tabes.

There were only 10 cases of paresis of which 6 were in the early stage and all responded fairly well with treatment. Tabes was found in 43 (27 percent) against 30 percent reported by Merrit et al (1946). Rajam et al (1956) found 82 (4.9 percent) tabes in a series of 1677 neurosyphilis of which 3 were juvenile tabes. In the present series 12 (28 percent) tabetics had optic strophy against 20 percent seen by

Merrit (1959). The only case of taboparesis showed reactive serology and nonreactive spinal fluid which is quite unusual. Pure syphilitic amyotrophy was found in 3, two with both upper and lower motor neuron involvement (Datta, Adhikary and Ghosh, 1966) and one had involvement of lower motor neuron type only.

Ocular involvement alone constitutes the largest group (40 percent) in this series. Optic nerves are ontogenically part of the brain and have the same structure as the intracerebral tracts and commissures Bruetsch, (1953) and therefore are included in the parenchymatous group. Optic atrophy was found in 44 (27.3 percent) and most of them were bilateral. In addition one had slight optic nerve damage due to meningeal involvement along with 7th cranial nerve palsy. Syphilis is the commonest cause of optic atrophy (20 percent) Bruetsch, 1953). One of the 17 retinochoroiditis was due to late congenital syphilis. In absence of malaria, once the commonest febrile condition in India, nutritional deficiency particularly vitamin A and vitamin B, may be the factors influencing the production of degeneration of optic nerve and spinal cord as has been claimed by animal experiments (Rajam, 1950). In the present study tabes and ocular syphilis comprise 106 (88 percent) of 120 parenchymatous cases.

Two third of the vascular were cerebral with motor hemiplega. Spinal vascular syphilis was limited to lower dorsal segments. The chief cerebral meningeal manifestation was cranial nerve palsy. 7th cranial nerve was found to be the commonest to be involved. Of the 14 nerve palsies, 2 were due to congenital syphilis affecting 8th cranial nerves on both sides, predominently the vestibular divisions. The only case of spinal meningeal one resulted in left foot drop probably due to involvement of both anterior and posterior roots as a result of extension of inflammation from the meninges at about the lower lumbar and upper sacral segments on one side only. 7 of the 13 cases of chronic spastic paraplegia due to meningomyelitis developed bladder symptoms. It is worth noting that not a single case of gumma of brain or spinal cord was admitted. Concurrent syphilitic lesion was found in only one late congenital case.

Blood serology was non-reactive in 1 only, a case of burnt out tabes where spinal fluid was also normal. 115 (71.36 percent) showed serologic titre 4 or below 4. Abnormalities in spinal fluid was observed in 103 out of 153 examined. VDRL was reactive 100 percent in paresis, 23.25 percent in tabes, 20.5 percent in optic atrophy and 10 percent in the meningovascular cases examined. Both blood and spinal fluid were reactive in 41.

150 completed treatment. 95 were treated with penicillin alone and 39 in combination with steroid. Steroid was usually preferred in cases with symptoms of recent outset and/or spinal fluid with high cell and protein contents. We are convinced that the result with penicillin and steroid was definitely better than the penicillin alone specially in meningeal and optic atrophy cases our experience with penicillin and fever is limited in this series. The therapeutic effects with broad spectrum antibiotics were comparable to penicillin.

The result of treatment was excellent in 12, slight to moderate in 103 (64 percent) and none in 35. Earlier the treatment was started better was the reasult.

SUMMARY

Clinic incidence of neurosyphilis was found in about 5 percent cases of late syphilis attended during 1960–67. Not a single clinical early neurosyphilis was admitted during the above study period. 4 were asymptomatic and 157 were symptomatic neurosyphilis. 3 of 161 were late congenital syphilitic. Parenchymatous involvement was markedly predominent (75 percent) so also the cerebral (60 percent) than spinal (38.2 percent). Duration of infection at the time of diagnosis was shortest (7.5 yrs) in meningeal and longest (17.6 yrs) in amyotrophy and retinochoroiditis. Inadquate treatment failed to protect from developing neurosyphilis. Reactive blood serology was found in all except one. Reactive spinal fluid was found in 41 (27 percent) out of 153 examined. Not a single case of reactive spinal fluid and non-reactive blood was found. Satisfactory result with treatment was obtained in 12 only out of 150 treated. Maximum improvement was noted in the meningeal group and nil in advanced cases of optic atrophy. Penicillin with steroid was considered better than penicillin alone in cases with symptoms of recent ontset and in cases with highly abnormal spinal fluid.

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REFERENCES

1. Brain, Lord (1962)—Diseases of the nervous system, Oxford University Press, London.
2. Bruetsch, W. L. (1953)—Syphilitic Optic Atrophy, Charles C Thomas, Springfield, Illinosis, U.S.A.
3. Datta, A. K. (1968)—I. J Dermat & Venerol, 34, Jan–Feb.
4. Datta, A K, Dasadhikari, C and Ghosh, S (1966—J. I M A, 47, 6, Sept. 16, 287–290.
5. Girard, P. F., Garde, A and Masson, R (1959 —Rev. Lyon, Med, 8, 1249, quoted by King A (1964 —Recent advances in Venereology, J & A Churchill Ltd.
6. King, A and Nicol, C (1964)—Venereal Diseases, Cassel, London.
7. Merrit, H. H (1959)—A text book of neurology Lea & Febiger, Philadelphia, U.S.A.
8. Merrit, H. H. Adam, R. D. and Solomon, H. C. (1946)—Neurosyphilis, Oxford University Press, New York.
9. Rao, S. V. (1954)—J.I.M.A., 24, 2, Oct. 16, 48–51.
10. Rajam, R V. (1956)—The third all India Conference of Dermatologists and Venereologists, Madras, Souvenir, 37–64.
11. Rajam, R V. (1956)—Brit. J. Ven. Dis, 32, 79–81.
12. Rajam R. V. and Rangiah, P. N. (1956)—J.I.M.A., 27, 7 Oct 1, 236–239.
13. Rajam R. V. (1950)—The Madras Medical Journal, 1, 1, Jan, 52–61.
14. Thomson, G. M. (1955)—Brit. J. Ven. Dis, 31, 184.