

EVALUATION OF THE FLUORESCENT TREPONEMAL ANTIBODY CSF TEST (FTA-CSF TEST)

C. N. SOWMINI AND K. N. GOPALAN

Summary

The Fluorescent treponemal antibody test has been performed on Cerebro-spinal-fluid from 397 patients of various categories. The findings indicate that this test is not merely of immunological importance but has a diagnostic value specially in problematic neurological cases of syphilitic origin.

The demonstration of treponema pallidum in the spinal fluid or brain tissue is the only sure method of diagnosing syphilitic infection of the central nervous system. The next method is indirectly by demonstrating the antibody in the C.S.F. For this, VDRL slide test is being widely used because CSF-VDRL is found to be a specific test unlike blood VDRL slide test. However, CSF-VDRL is not a very sensitive test with the result it is incapable of picking up all cases of Neuro-Syphilis like vascular neuro-syphilis with minimal meningeal reaction, inadequately treated neuro-syphilis, adequately treated neuro-syphilis showing clinical progression and asymptomatic neuro-syphilis in early syphilis. So in the search for a more sensitive test FTA and other allied tests have been used since 1960. (Harris et al¹, Vaisman and Hamelin², Neil and Fribourg-Blance³). But it has failed to gain popularity because firstly the

CSF-VDRL test rarely gives false positive reactions (Chacko et al⁴). Secondly the reactive CSF-VDRL shows activity of the neuro syphilitic process (C.U.S. Dept⁵. HEW). Thirdly the CSF-FTA test is supposed to be only of immunological interest and does not show activity of the neuro syphilitic process (Duncan et al⁶).

The clinicians are at times confronted with patients having undoubtedly late neuro syphilitic conditions but without any supporting laboratory evidences. In such cases, the less sensitive VDRL slide test is not able to give a clue to the etiology, therefore one has to resort to a more sensitive test like CSF-FTA test. Furthermore, it is well accepted that the central nervous system gets involved early during the syphilitic infection without any clinical or usual laboratory evidences indicating the involvement of the central nervous system. (Merrit⁷) Thus at this stage, the CSF-FTA test may be useful in detecting antibodies present in sub-optimal doses. This will help the clinician to identify asymptomatic neuro syphilis and institute proper therapy during the pre-symptomatic stage. Hence this paper is an attempt

Paper read at the Annual Conference of the Indian Association of Dermatologists, Venereologists and Leprologists held at Udaipur in January, 1973

Institute of Venereology, Madras Medical College, Madras 3, Tamil Nadu.

Received for Publication on 12-4-1973

to evaluate the usefulness of CSF-FTA test as a diagnostic test in problematic cases of neuro syphilis.

Materials and Method

Cerebro-spinal fluids from 397 patients attending the Institute of Venereology, Neurology, and Surgical side of the Government General Hospital were taken up for this study. The CSF collected from the above sample based on the diagnosis furnished by the Clinicians was categorised :

A. Non-syphilitics:	104
(a) Minor surgical cases	25
(b) Neurological cases	79
B. Syphilitics	293
(a) Non-neuro syphilitics	193
i. Early (Sy. I; II latent)	79
ii. Late (latent and symptomatic)	114
(b) Neuro syphilis and ocular syphilis	100
i. Meningo vascular	43
ii. Paresis	33
iii. Tabes	3
iv. Optic atrophy	11
v. Other ocular syphilitic conditions	10
	<hr/>
	Total 397

The serum from all these patients were tested for VDRL slide test in parallel. The cell count and total protein estimation of the CSF were also carried out in majority of the cases.

The CSF-VDRL was performed by the slide method. (Duncan et al⁸) The FTA test was done with the undiluted CSF and a 2+ fluorescence was taken as an end point. The results were reported as reactive or non-reactive. (Harris et al¹)

Results

Table I shows results of VDRL and FTA tests on the CSF's from different categories of patients. In all non-syphilitic presumably normals (surgical cases-hydrocele, hernia) the FTA-CSF was non-reactive giving a 100% specificity. The blood VDRL slide test in 23 cases tested were also non-reactive confirming the specificity of FTA-CSF test. In the same table out of 79 cases of non-syphilitic abnormal with neurological lesions 77 showed non-reactive CSF-FTA test again giving a specificity of 97.47%. The two patients who showed a reactive FTA-CSF test were diagnosed as Tuberculous meningitis and brain tumour. However, the patient with brain tumour had anamnesic evidence of syphilis and also his blood VDRL and FTA were reactive. Whereas, the second one, a case of tuberculous meningitis had no evidence of syphilis. Now, out of the 79 cases there were 9 cases of tuberculous meningitis and only one in this group showed reactivity in the CSF to FTA test. Investigation of a larger series of tuberculous meningitis cases is warranted to see whether tuberculous meningitis will give rise to a false positive reaction with FTA test.

The same table shows that out of 193 known syphilitics other than neuro syphilitics 3 or 1.6% of cases showed asymptomatic neuro syphilis by VDRL slide test whereas with CSF-FTA 64 or 33.2% cases showed asymptomatic neuro syphilis. What is the clinical relevance of this highly sensitive FTA-CSF test in these cases? It might give us an indication that the reactive ones

TABLE I

Result of V. D. R. L. & F. T. A. tests on the C. S. F.'s from Different Categories of Patients

Categories	No. of Patients	C. S. F.				Specificity	Sensitivity	
		VDRL		FTA			VDRL	FTA
		R.	N.R.	R.	N.R.			
Non-syphilitic:								
Normal (surgical cases)	25	0	25	0	25	100%		
Non-syphilitic abnormal (Neurological cases)	79	0	79	2	77	97.47%		
Syphilitic:								
Known syphilitics other than neuro syphilis	193	3	190	64	129	1.6%	33.2%	
Neuro syphilis	100	33	67	80	20	33%	80%	
Total	397	36	361	146	251			

R : Reactive

N. R. : Non-reactive

are likely to develop symptomatic neuro syphilis at a later date if left untreated. Table I also shows 100 cases belonging to different categories of neuro syphilis studied. Of these 80% were reactive to the CSF-FTA test while 33% alone were reactive to CSF-VDRL test. The remaining 20 cases were non-reactive to VDRL and FTA test of which 8 were untreated neuro syphilitics, 7 were inadequately treated neuro syphilitics and five treated neuro syphilitics. Out of the 80 cases that were reactive to CSF-FTA test, 46 were untreated neuro syphilitics 12 inadequately treated neuro syphilitics and 22 treated neuro syphilitics.

Table II shows comparative data on the CSF-VDRL and CSF-FTA on 64 syphilitics early and late other than non-neuro syphilitics. Most of the patients who showed CSF-FTA reactivity belonged to the late syphilitic group. Of the 64 cases, 24 or 31.25% showed other CSF abnormality like increased cells and increased protein adding additional information that changes in the CSF can occur inspite of a negative VDRL slide test.

TABLE II

Comparative Data on the C. S. F. Reactivity of V. D. R. L. & F. T. A. on 64 Syphilitics (Early and Late) other than Neuro-syphilitics.

Category	V. D. R. L.	F. T. A.
Early	0	20
Late	3	44
Total	3	64

Table III shows the percentage of reactivity in CSF-FTA and VDRL test in treated, untreated and inadequately treated cases of neuro syphilis. CSF-VDRL was reactive only in 51.8% of untreated cases and it was as low as 10.5% in inadequately treated and treated cases whereas CSF-FTA was found to be uniformly high. Irrespective of the treatment or non-treatment the CSF-FTA remains reactive. This poses two problems (1) whether or not the treatment given was sufficient and (2) whether or not this FTA reactivity is only an immunological scar?

In observing neuro syphilitics clinically it has been found that some remains stationary and some show clinical

TABLE III

C. S. F. F. T. A. and V. D. R. L. Reactivity (%) and Treatment Status of 100 Neuro-syphilitic patients.

		F. T. A. Reactive		V. D. R. L. Reactive	
		Number	Percentage	Number	Percentage
Untreated	54	46	85.2	28	51.85
Inadequately treated	19	12	63.2	2	10.5
Treated	27	22	81.5	3	11.1
Total	100	80	80	33	33

progression. For example, for the past ten years, two cases under our observation show clinical progression with non-reactive VDRL slide test and reactive FTA test both in the blood and CSF. On admission ten years ago these patients had laboratory evidence of a reactive VDRL, both in blood and CSF. Repeated courses of anti-syphilitic treatment were administered whenever they showed evidence of progression. Hence perhaps it is worthwhile to have a long term clinical study along with CSF-FTA test to solve the above mentioned problems.

However, one fact remains that is CSF-FTA test is a good diagnostic test for diagnosing problematic neuro syphilis cases and also asymptomatic neuro syphilis in early stage of syphilis.

Acknowledgment

We wish to thank the Superintendent, Government General Hospital, the Principal, Madras Medical College for permitting to utilise the hospital facilities and the Government of Tamil Nadu for permitting to read and publish this paper.

REFERENCES

- Harris A, Bossak HN, Deacon WE et al: Comparison of the Fluorescent treponemal antibody test with other tests for syphilis on cerebrospinal fluids. *Brit J Vener Dis* 38: 178, 1960.
- Vaisman A, and Hamelin A: Application to the serological diagnosis of syphilis of the immunofluorescent method. *Presse Med* 69: 1157, 1961 (Fr).
- Niel G, and Fribourg - blanc A: Quantitative fluorescent antibody tests and the serology of syphilis. Report on 10,000 sera and specimens of cerebrospinal fluid. *WHO VDT* 315: 1, 1964.
- Chacko CW, Krishnamoorthy N, and Gopalan KN: A comparative study of the complement fixation and the precipitation *Indian J Derm Ven* 23: 145, 1957.
- US Dept. of Health Education and Welfare: Syphilis a synopsis. PHS publication No. 1660, US Govt. printing office, Washington, 1968.
- Duncan WP, Jenkins TW, and Parham CE: Fluorescent treponemal antibody cerebrospinal fluid (FTA-CSF) test. *Brit J Vener Dis* 48: 97, 1972.
- Merritt HH: A text book of Neurology Lea and Feibger, Philadelphia, 1963, P 120
- Duncan WP, Bossan HN, and Harris AD: VDRL slide spinal fluid test. *Amer J clin Path* 35: 93, 1961.