Screening for syphilis and neurosyphilis in acute psychiatric admissions

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Abstract

The value of blood screening for syphilis and cerebrospinal fluid (CSF) screening for neurosyphilis in acute psychiatric admissions is assessed. Of 1 296 patients, 248 (19%) had evidence of previous or current syphilis as shown by a positive *Treponema pallidum* haemagglutination test, and 68 (5,2%) had potentially treatable syphilis as shown by a positive Venereal Disease Research Laboratory (VDRL) titre. CSF examination was performed on 169 patients with a positive blood test. Seventeen (i.e. 1,3% of all patients included in the study) met our criteria for neurosyphilis. The best predictor for neurosyphilis was the presence of a reactive serum VDRL. However, it is recommended that all patients with a positive blood test and symptoms that could possibly be ascribed to neurosyphilis undergo CSF examination.

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Neurosyphilis is a serious and debilitating illness leading to severe neurological and cognitive impairment. The psychiatric manifestations of neurosyphilis are notoriously varied.[1-3] Most commonly seen are the simple dementing form, the depressive form and a grandiose form, often with the full manic syndrome. Other psychiatric manifestations include insidious personality changes and psychotic symptoms, which in the early stages may resemble schizophrenia.[4] For these reasons it is necessary to consider the diagnosis of neurosyphilis in a large proportion of psychiatric patients.

Because neurosyphilis is readily preventable if syphilis is diagnosed and adequately treated,[5,6] it would seem prudent routinely[6] to perform blood tests for syphilis in psychiatric patients. Furthermore, because progression can be halted and improvement can even be expected with early diagnosis and treatment of neurosyphilis,[7,8] it is necessary to test the cerebrospinal fluid (CSF) of high-risk patients. The major problem here, however, is that no clear guidelines exist as to what constitutes a 'high-risk' patient.

Various authors have addressed the issue of routine screening for syphilis and neurosyphilis in psychiatric patients. Banks[9] investigated the value of routine serum screening for syphilis in a mental hospital in Britain. In order to achieve a yield of 3 cases of neurosyphilis over a 5-year period, 2 625 routine blood tests had to be performed. In a screening programme in the USA involving 300 outpatients attending community mental health clinics,[10] 4 cases of neurosyphilis were diagnosed — a case yield of 1,3%. In a study in Jamaica,[11] however, 26% of 200 unselected psychiatric admissions had syphilis on routine screening and 8,5% had neurosyphilis. Unfortunately, none of these studies indicates which psychiatric patients are more likely to have neurosyphilis.

The present study attempted to assess the value of routine serological screening for syphilis and also the value of CSF examination in patients with positive blood serology in acute psychiatric admissions. In addition, 'risk factors' were sought that might predict which psychiatric patients were more likely to have neurosyphilis.

Patients and methods

All adult patients admitted to a short-term psychiatric admission unit at Tygerberg Hospital between 15 September 1987 and 15 September 1989 were included in the study. Serological tests for syphilis were routinely performed on the blood of all subjects. The tests comprised the *Treponema pallidum* haemagglutination (TPHA), fluorescent *Treponema* antibody absorption (FTA-Abs) and the Venereal Disease Research Laboratory (VDRL). The serum VDRL and FTA-Abs were only performed on sera showing a positive TPHA result. In order to detect undiagnosed cases of neurosyphilis, an attempt was made to examine the CSF of all subjects with positive blood serology (i.e. at least a positive TPHA test). CSF examinations consisted of biochemical analyses (total protein levels, IgG index, serum glucose level), microscopy and tests for syphilis (TPHA, FTA-Abs and VDRL). At least one of the following criteria, adapted from Burke and Schaberg,[12] were used to diagnose neurosyphilis: (*i*) CSF VDRL titre of 1:2 or more; or (*ii*) positive CSF TPHA and FTA-Abs and **1** of the following: (*a*) CSF cell count more than 5/ml, and (*b*) CSF protein more than 0,45 g/l and/or IgG index more than 0,70.

Patients with other neurological disorders which could cause CSF abnormalities were excluded from the study. Demographic and clinical data were obtained from the hospital files.

In order to determine the predictive value of a positive VDRL titre for diagnosing neurosyphilis, all patients with serological evidence of past or present syphilis (i.e. positive blood TPHA) were classified according to whether they had a negative blood VDRL titre (TPHA positive only) or a positive VDRL titre (TPHA and VDRL positive). The positive predictive value of a diagnostic procedure (proportion of persons with a 'positive' test who turn out to have the disease) and negative predictive value (proportion of 'negatives' who do not have the disease) are helpful in assessing the suitability of that procedure in a given clinical setting. In addition, the subjects were divided according to their psychiatric diagnoses into one of two groups: those with delirium, dementia or psychosis and those without any of these diagnoses. The predictive values of a positive or negative VDRL test in the presence or absence of the above diagnoses were calculated.

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Results

Patients with syphilis

During the specified 2-year period 1 406 adult patients were admitted. Two patients in whom neurosyphilis had been diagnosed before admission were excluded. Blood TPHA tests were performed on 1 296 patients (92%). Of these, 248 (19%) had evidence of previous or current syphilis as shown by a positive TPHA test. In these patients the VDRL titre was positive in 68 (27%) and negative in 180 (73%). Thus, of the 1296 patients tested, 68 had a positive VDRL titre — a case yield of potentially treatable syphilis of 5,2%. (A positive VDRL titre is used at Tygerberg Hospital as the major criterion for treatment of syphilis, provided that the patient has not been treated in the recent past.)

Patients with neurosyphilis

CSF examination was performed on 169 patients (68%) with a positive TPHA test. Of these, 52 had reactive blood VDRL tests. Seventeen of the patients who underwent CSF examination met our criteria for neurosyphilis. Thus 1,3% of all patients included in the study, and 10% of those with a positive blood TPHA test, had neurosyphilis. Pertinent clinical and laboratory data for the 17 patients who met our criteria for neurosyphilis are shown in Table I.

Predictive value of the blood VDRL test in patients with positive blood TPHA tests

Of the 52 patients who had a reactive VDRL test and whose CSF had been examined, 15 were found to have neurosyphilis, giving a positive predictive value of a positive VDRL test of 29%. Of 117 patients with negative VDRL (but positive TPHA), 2 were found to have neurosyphilis. Thus the negative predictive value for a negative VDRL test was 98%.

Predictive value of the symptoms of delirium, dementia or psychosis in patients with a positive blood TPHA test

Patients with a positive blood TPHA test were classified according to whether or not they had a diagnosis of delirium, dementia or psychosis. (Two patients were excluded due to uncertain diagnoses.) The presence of any one of the above psychiatric diagnoses in patients with a positive VDRL test did not make a diagnosis of neurosyphilis more likely (positive predictive value = 29%). Because of the relatively large number of patients with neurosyphilis presenting with dementia, it was further decided to assess the predictive value of the presence of dementia together with a positive blood VDRL titre. All patients meeting these two criteria ($N = 11$) were found to have neurosyphilis, i.e. the positive predictive value was 100%. However, it should be remembered that some of the diagnoses of dementia were made retrospective to the results of blood and/or CSF tests for syphilis being known.

Discussion

The finding that 19% of all patients tested had evidence of previous or current syphilis (i.e. a positive TPHA test) emphasises the widespread prevalence of this disease in the population studied. The fact that 5,2% had evidence of active syphilis (i.e. a positive VDRL test) reconfirms the need for routine screening for the disease in these patients.[13]

The need for lumbar puncture in patients with positive blood tests for syphilis but without neurological signs has been questioned.[14] It was argued that asymptomatic neurosyphilis is adequately treated (i.e. will remain asymptomatic) with the same penicillin regimens that are used in patients with latent syphilis, and that lumbar puncture is therefore of academic importance only. On the other hand, there are indications that this approach would be unwise. There have been reports of progression to symptomatic neurosyphilis in such patients who had been treated for latent syphilis (i.e. with intramuscular penicillin G benzathine).[15,16] Furthermore, penicillin G benzathine was found not to have crossed the blood-brain barrier in sufficient quantities to have reached treponemicidal concentrations in the CSF of patients with latent syphilis.[17] For these reasons, we believe that it is necessary to distinguish between latent syphilis (no CNS involvement) and asymptomatic neurosyphilis by means of CSF examination, although some patients may unnecessarily receive treatment for neurosyphilis when the simpler regimen used for latent syphilis would be adequate.

In the present study, the prevalence of neurosyphilis in psychiatric patients with a positive blood test for syphilis was 10%. Although our study was marred by

TABLE I.
Details of the 17 patients with neurosyphilis

Sex	Age (yrs)	Psychiatric diagnosis	Blood VDRL*	CSF VDRL	CSF Cells/ml	CSF Protein (g/l)	CSF IgG index
M	35	Delirium + dementia	1:128	1:2	13	0,95	9,20
M	33	Dementia	1:4	1:4	7	0,81	2,50
M	39	Delirium	1:16	1:8	33	1,00	4,96
M	37	Delirium + dementia	1:16	1:8	19	2,10	1,02
M	35	Delirium	1:128	1:16	27	0,70	ND
M	38	Dementia	1:32	1:8	5	1,30	1,30
M	51	Dementia	1:8	1:4	8	0,50	3,14
M	36	Dementia	1:16	1:8	15	1,00	6,96
F	51	Delirium + dementia	1:64	1:4	108	1,50	1,62
M	48	Delirium + dementia	1:64	1:4	10	0,80	ND
F	21	Delirium	1:128	1:2	48	0,49	ND
M	30	Dementia	NEG	1:4	49	0,97	2,85
M	33	Dementia	1:16	NEG	0	0,33	3,14
F	37	Depression	1:64	NEG	2	0,94	0,53
M	30	Dementia	1:128	1:4	35	1,29	5,37
F	21	Depression	1:64	NEG	22	0,18	0,61
F	50	Depression	NEG	NEG	1	0,53	0,53

* All patients had positive CSF TPHA and FTA-ABS tests.
ND = not determined.

the low proportion of lumbar punctures done in cases with reactive blood serology (68,1%), we still believe that some useful conclusions can be drawn. The presence of a psychiatric diagnosis of either delirium, dementia or psychosis was found not to be helpful in the decision to do a lumbar puncture on a given patient. We found the best predictor for neurosyphilis in our patients to be the presence of a reactive serum VDRL test because the positive predictive value was 29%. Otherwise stated, nearly one-third of the patients in this study who had a positive blood VDRL test were found to have neurosyphilis. The coexistence of dementia and a positive blood VDRL test was diagnostic of neurosyphilis. However, the fact that 2 patients with a negative blood VDRL test were also found to have neurosyphilis leads us to conclude that, in order to detect all cases of neurosyphilis, all patients with a positive TPHA test and presenting with a psychiatric disorder, which could be a manifestation of neurosyphilis, should undergo lumbar puncture.

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Syphilis in the 'unbooked' pregnant woman

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Abstract

To determine the prevalence of syphilis in the 'unbooked' pregnant woman attending King Edward VIII Hospital, Durban, mothers who had no previous history or record of antenatal care were studied over a 3-month period. One hundred and fourteen mothers were recruited, 35 (30,7%) of whom had reactive syphilis serology. None had clinical evidence of primary or secondary syphilis. Clinical evidence of congenital syphilis was found in 4 of the 35 (11,5%) babies born to mothers with reactive syphilis serology. While the fluorescent treponemal antibody absorption (FTA-ABS) IgG test was positive in umbilical cord and neonatal venous blood of all 35 babies, the FTA-ABS IgM test was negative in all specimens, including the sera from the 4 babies with clinical signs of syphilis. The FTA-ABS IgM test is therefore of little value for the laboratory confirmation of congenital syphilis. It also has limitations when it comes to screening asymptomatic neonates born to mothers with reactive syphilis serology.

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The incidence of syphilis in pregnancy is on the increase with an accompanying increase in perinatal morbidity and mortality. This increase occurs particularly in urban areas and developing communities and is probably related to socio-economic factors.[1] In Durban, one of the fastest growing cities in the world, syphilis is one of the most important causes of perinatal death. Ross[2] found that 4 perinatal deaths in every 1 000 singleton births were due to congenital syphilis. Moreover, the prevalence of the early and late manifestations of congenital syphilis continues to remain a major problem in South Africa.[3]

In 1983 Naicker and Moodley,[4] working in Durban, noted a high incidence of syphilis in pregnant women attending the antenatal clinic at King Edward VIII Hospital. However, a large proportion of women who deliver at this major urban hospital do not present for antenatal care and the prevalence of syphilis in this 'unbooked' group is not known. We therefore decided to investigate the prevalence of syphilis in these unbooked pregnant patients and the perinatal outcome.

Patients and methods

Patients

Informed consent was obtained from all patients included in the study. These patients presented for delivery to the labour ward at King Edward VIII Hospital, and had received no previous medical care either at a hospital, from a general practitioner, or at a community clinic.