Original Research Article

# Study of Cerebro-spinal fluid in HIV patients of Southern Maharashtra Population

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## Abstract

**Background:** CSF analysis is important for the diagnosis of opportunistic inactions and co-infections in the CNS. As HIV is most opportunistic infection can co-exist with other infections because of immune suppression. **Method:** 95 HIV patients aged between 19-50 years were conformed again by CD4 count CSF was drained through lumbar puncture MRI was also done to rule out tumours atrophy of the brain. **Results:** Body weight of the patients – 59 (62%) was between 38-45 kg, 36 (37.8%) was between 46-56 kg serum Creatinine level in 53 (55.7%) was 0.80 to 0-90mg/dL 42 (44.2%) between 0.91 to 100 mg/dL. CD4 count in 57 (60%) was between 83 to 100 cells/mm3$^{m}$, 38 (40%) 101 to 140 cells/mm3$^{m}$. Clinical manifestations were 37 (38.9%) had headache, 11 (11.5%) had fever, 16 (16.8%) had mental confusion, 17 (17.8%) had vomiting, 8 (8.42%) had dizziness, 6 (6.31%) had seizures. The associated diseases were – 29 (30.5%) TB, 49 (51.5%) Candida, 14 (14.7%) diarrhoea 3 (3.1%), pneumonia The contents of CSF was protein – 63 (66.3%) had between 75-80 mg/dL, 32 (33.1) between 81-90 mg/dL, sugar level in 62 (65.2%) was "Between" 38-44, In 35 (34.7%) were "Between" 45-50. Cells in CSF – 59 (62.1%) had 5-7 µL, 36 (37.8%) had 8-10 µL. India ink staining in 37 (38.9%) was 19-25, 58 (61%) 20-26, Cyptococcal antigen titre in 30 (31.5%) 3-4 in 65 (68.4%) 5-10, culture base line in 72 (75.7%) was 20-26, 23 (24.2%) 27-29. **Conclusion:** This pragmatic study will help to diagnose the seventy of HIV and treat the disease efficiently and symptomatically as HIV is only treatable disease.

**Keywords:** HIV, AIDS, CSF, Lumbar puncture, Neuro-vascular, CNS=Central Nervous System

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## INTRODUCTION

Cerebro-spinal fluid (CSF) is a modified tissue fluid, produced in ventricles of the brain. Apart from nutrition, excretion and shock absorber, it reflects the disease of the brain and spinal cord [(1)]. Whenever any pathogenesis cross the blood brain barrier the contents, colour (appearance) of CSF varies and affect the neuro-vascular system of the body and leads to multiple clinical symptoms like headache, seizure, mental confusion, focal neurological deficit, vomiting dizziness, meningitis coma etc [(2)]. Mycobacterium tuberculosis, cryptococcal meningitis is fungal meningitis was detected in CSF. Moreover in immune-compromised disease (HIV) the CSF becomes gelatinous and or fibrous apart from variations in the contents and staining [(3)]. CSF analysis is more important for the diagnosis of opportunistic infections and co-infections of central Nervous System (CNS). In HIV patient's more than one opportunistic infection can co-exist because of immune-suppression [(4)]. Hence attempt is made to study the contents of CSF in detail to correlate and confirm the HIV infections.

## MATERIAL AND METHOD

95 HIV patients regularly visiting to JIIU's Indian institute of Medical Sciences and research hospital Jalna Road Warudi, Badnapur (tq), Jalna (dist), and Maharashtra were studied.

**Inclusive Criteria:** The aged between 19-50 years having symptoms of HIV associated with diarrhoea, candid TB having decreased CD4 count were selected for study.

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**Exclusion Criteria:** The patients having malignancy septicaemia, cardio-vascular disease patients were excluded from study.

**Method:** The HIV test was done again (CD4 count) to confirm the admitted patients. The patients having neurological symptoms like headache, confusion vomiting, seizures were ruled out and CSF was drained through lumbar puncture. In most of the cases CSF was gelatinous or fibrous MRI of brain was also done to rule out any tumours, atrophy of the brain.

The duration of study was (July-2018 to August-2020) three years.

**Statistical analysis:** Clinical manifestations, Base line study associated diseases; contents of CSF were classified with percentage. The statistical study was carried out SPSS software. The ratio of male and female were 2:1.

## OBSERVATION AND RESULTS

**Table – 1:** (1) In the study of base line parameters in HIV patients – 59 (62.1%) patients body weight was 38 to 45 Kg, 36 (37.8%) patients body weight was between 46-56 Kg.

(2) In serum Creatanine analysis study – 53 (55.7%) patients had 0.80 to 0.90, 42 (44.2%) patients had serum Creatanine level "Between" 91 to 100.

**Table 1:** Study of base line parameters in HIV patients (No. of patients: 95)

| Sl. No | Parameters | No. patients | Percentage |
|---|---|---|---|
| 1 | Body weight | | |
| | 38-45kg | 59 | 62.10 |
| | 46-56 kg | 36 | 37.89 |
| 2 | Serum creatinine | | |
| | 0.80 to 0.90 mg/d1 | 53 | 55.7 |
| | 0.91 to 100 mg/d1 | 42 | 44.2 |
| 3 | CD4 Count | | |
| | 83 to 100 | 57 | 60 |
| | 101 to 140 cell/mm | 38 | 40 |

(3) The $CD_4$ count was 83 to 100 cells/$mm^3$, in 57 (60%) patients 38 (40%) patients had 101 to 140 cells/$mm^3$.

**Table – 2:** Clinical manifestations in HIV patients was – 37 (38.9%) had headache, 11 (11.5%) had fever, 16 (16.8%) had mental confusion, 17 (17.8%) had vomiting, 8 (8.42%) had dizziness, 6 (3.31%) had seizures.

**Table 2:** Clinical manifestations of HIV patients

| Sl. No | Particulars | No. of patients (95) | Percentage |
|---|---|---|---|
| 1 | Headache | 37 | 38.9 |
| 2 | Fever | 11 | 11.5 |
| 3 | Mental confusion | 16 | 16.8 |
| 4 | Vomiting | 17 | 17.8 |
| 5 | Dizziness | 8 | 8.42 |
| 6 | Seizures | 6 | 6.31 |

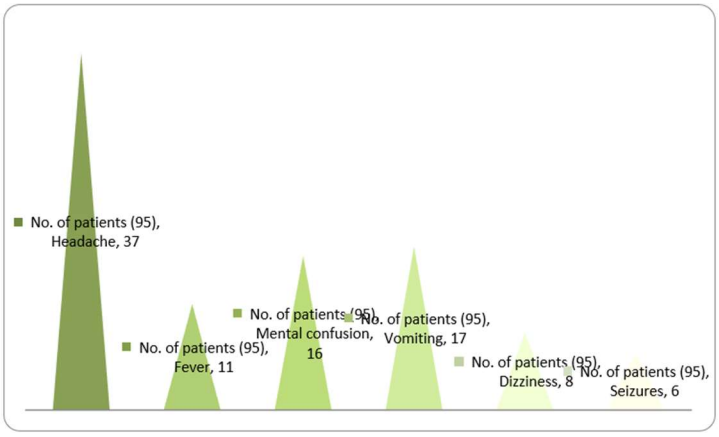


**Table 2:** Clinical manifestations of HIV patients

**Table – 3:** Study of associated diseases in HIV patients – 29 (30.5%) had TB, 49 (51.5%) had Candida, 14 (14.7%) had Diarrhoea, 3 (3.1%) had pneumonia.

**Table 3:** Study of associated diseases in HIV patients

| Sl. No | Diseases | No. of patients (95) | Percentage |
|---|---|---|---|
| 1 | Tuberculosis Bacillus (TB) | 29 | 30.5 |
| 2 | Candida | 49 | 51.5 |
| 3 | Diarrhoea | 14 | 14.7 |
| 4 | Pneumonia | 03 | 3.1 |

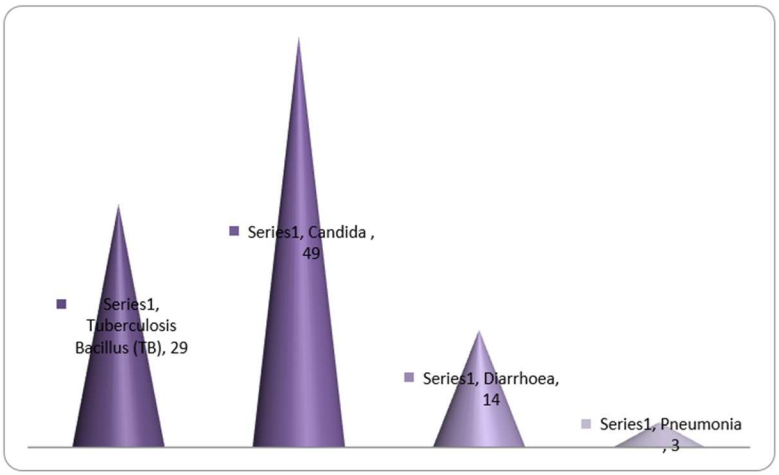


**Table 3:** Study of associated diseases in HIV patients

**Table – 4:** Study of contents of CSF in HIV patients.
(1) Protein value – 63 (66.3%) patients had 75-80 mg/dL, 32 (33.6%) had 81-90 mg/dL.
(2) Sugar value – 62 (65.2%) had 38-44, 45-50.
(3) Cells – 59 (62.1%) had 5-7 µL, 36 (37.8%) 8-10 µL.
(4) Indian Ink Staining – 37 (38.9%0 had 19-25, 58 (61%) had 20-26.
(5) Cryptococcal antigen titre – 30 (31.5%0 had 3-4, 65 (68.4%) had 5-10.
(6) Culture base line – 72 (75.7%) had 20-26, 23 (24.2%) had 27-29.

**Table 4:** Study of Contents CSF in HIV patients

| Sl. No | Contents | No. of patients (95) | Percentage |
|---|---|---|---|
| 1 | Protein | | |
| | 75-80 mg/dL | 63 | 66.3 |
| | 81-90 mg/dL | 32 | 33.6 |
| 2 | Sugar | | |
| | 38-44 | 62 | 65.2 |
| | 45-50 | 33 | 34.7 |
| 3 | Cells | | |
| | 5-7 µL | 59 | 62.1 |
| | 8-10 µL | 36 | 37.8 |
| 4 | India Ink staining | | |
| | 19-25 | 37 | 38.9 |
| | 20-26 | 58 | 61.0 |
| 5 | Cryptococal antigen titre | | |
| | 3-4 | 30 | 31.5 |
| | 5-10 | 65 | 68.4 |
| 6 | Culture base line | | |
| | 20-26 | 72 | 75.7 |
| | 27-29 | 23 | 24.2 |

## DISCUSSION

In the present study of CSF in HIV patients in southern Maharashtra. The Body weight of patients 59 (62.1%) were between 38-45 kg, 36 (37.8%0 were between 46-56 kg, serum creatnine value in 53 (55.7%) 0.80 to 0.90 mg/dL, 42 (44.2%) had 0.91 to 100 mg/dL. $CD_4$ count in 57 (60%) 83 to 100 cells/$mm^3$, 38 (40%) had 101 to 140 cells/$mm^3$, (Table-1) clinical manifestation were 37 (38.9%) had headache, 11 (11.5%) had fever, 16 (16.8%) had mental confusion, 17 (17.8%) had vomiting, 8 (8.42%) had Dizziness, 6 (6.3%0 had seizures (Table-2). The associated diseases were 29 (30.5%) had TB, 49 (51.5%) had Candida, 14 (14.7%) had diarrhoea, 3 (3.1%) had pneumonia (Table-3). The contents of CSF were protein was 75-80 mg/dl in 63 (66.3%) 32 (33.6%) had 81-90 mg/dl. The sugar level in 62 (65.2%) had 38-44, in 33 (34.7%) had 45-50. The presence of cells in 59 (62.1%) had 5-7 µL, 8-10µL. India ink staining in 37 (38.9%) was 19-25, 58 (61%0 had 20-26. The cryptococcal antigen titre in 30 (31.5%) was 3-4, in 65 (68.4%) 5-10. The culture base line in 72 (75.7%) had 20-26, 23 (24.2%) had 27-29 (Table-4). These findings are more or less in agreement with previous studies [(5)(6)(7)].

The nervous and immune systems are the HIV targeted organs. However the incidence of neurological complications related of HIV has increased considerably [(8)] probably because of the low penetration of anti retroviral (ARV) drugs into CNS or neuronal toxicity of ARV drugs or persistence of neuronal lesions might have caused during initial treatment [(9)]. It is also reported that, poly neuropathies myelopathies are associated with HIV. The cells observed in CSF are apoptosis, which are dead due to infection caused by HIV. It is also noted that; different concentration of ARV drugs are found in the drugs that penetrate Blood brain barrier (BBB) is considered necessary to control infection in the CNS in the patients at an advanced stage of the disease particularly those with neurological problems [(10)].Cryptococcal meningitis is one if the acquired immune deficiency syndrome defining infections with high morality because of late penetration of ARV drug.

## SUMMARY AND CONCLUSION

The present study of CSF analysis has well defined and valuable role in the diagnosis opportunistic infections and co-infections of HIV/AIDS patients. But this study demands further research to establish a clinically applicable bio-marker for HIV associated neuro-cognitive disorders diagnosis, promising CSF bio-markers including neopterin and light neurofilaments because exact Bio marker in the CSF to diagnose HIV/AIDS is yet to identified.

This research paper is approved by Ethical committee of JIIUS Indian Institute of Medical Sciences and Research, Jalna Road Warudi, Badnapur (tq), Jalna (dist) – 431202. (Maharashtra)

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