



CORRELATION OF EXTRA PULMONARY TUBERCULOSIS IN PEOPLE LIVING WITH HIV HAVING HEAD AND NECK MANIFESTATIONS ON THE BASIS OF CD4+ CELLS COUNT

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ABSTRACT

Introduction: AIDS is a deadly disease and is leading cause of morbidity in today's population .EPTB is one of most common opportunistic infection associated with AIDs and cervical lymphadenopathy is most common among them . CD4+ cells in our body plays an important role in treatment outcome of AIDS patients and is marker of good immunity. **Materials And Methods:** This is a retrospective analysis conducted in a tertiary centre in the Department of Otorhinolaryngology & head and neck surgery from January 2020 to December 2020. A total of 80 patients were studied for 1 year. Confirmed cases of AIDS with extra pulmonary tuberculosis in head and neck region were studied, keeping all ethical issues in mind and there CD4+ counts were followed up for 3, 6 and 12 weeks. **Results:** All patients under study were given HAART and ATT simultaneously, 69 % patients have cervical lymphadenopathy as the most common site of extrapulmonary tuberculosis, and CD4+ cells >500 cells/mm3 at the time of diagnosis proved to respond better to therapy. Also 84 % patients are resolved with EPTB after the treatment. **Conclusion:** Start ATT along with HAART as soon as possible to improve quality of life of the patient. Serial monitoring of cells is beneficiary for monitoring the prognosis of disease.

KEYWORDS

EPTB, CD4+ cells , cervical lymphadenopathy, HAART

INTRODUCTION:

HIV continues to be a major global public issue of health, which have claimed around 33 million lives till now. HIV i.e., human immunodeficiency virus is a species of *lentivirus*, which is a subgroup of retrovirus family. After a time when it infects the human, it causes an acquired immunodeficiency syndrome (AIDS), which is a condition in which there is progressive downfall of individual's immune system. Our immune system acts as a barrier, which protects us from various infections and diseases and helps our body fight some non-welcomed diseases. Our immune system is naturally so strong that it does not allow our body to get sick. AIDS is such a condition in which there is decreased cell immunity and this leads our body exposed to many diseases, with which our body cannot fight.

Some micro-organisms are already present in our mucosa, but they do not cause any damage as our immunity continuously suppresses their actions. In AIDS as there is decreased immunity at the local level too, these normally living micro-organisms, starts producing symptoms of diseases, these diseases, which are due to the opportunity of our reduced immunity, are called as opportunistic infections.3

It includes pneumonia, Salmonella, candidiasis, toxoplasmosis, and tuberculosis.

Both pulmonary and extra pulmonary tuberculosis is common in AIDS patients as an opportunistic infection, but incidence of pulmonary TB is much more. In recent times there is significant reduction in pulmonary tuberculosis as due to effective medications and great responsiveness.

Tuberculosis of the head and neck region comprises about 10% of all the cases of extra-pulmonary tuberculosis and cervical lymph nodes are the most commonly affected followed by laryngeal tuberculosis, deep neck space infections and tuberculous otitis media.

MATERIALS AND METHODS:

The present study is the retrospective analysis and was conducted in a tertiary centre in a teaching hospital in the department of Otorhinolaryngology, Gandhi medical college, Bhopal, from January 2020 to December 2020. A total of 80 patients were examined and taken for study. Study was performed for a period of 1 year, in which

the duration of follow-up of the patients is included. Out of 80 patients, 18 patients lost to follow-up and 7 patients were less medicine compliance. The patients were taken who are attending outdoor and indoor patients directly or indirectly from the Anti-Retroviral Therapy centre of our institute.

The study included confirmed cases of AIDS along with extrapulmonary tuberculosis mainly of head and neck region. Patients were informed thoroughly about the study and informed written consent was taken from each patient before the study. Follow up was done for 3 months, 6 months and 12 months.

Inclusion Criteria:

Patients having confirmed AIDS, Patients having positive extrapulmonary tuberculosis of head and neck region like lymph nodes, parotid swelling.

Exclusion Criteria :

People diagnosed with tuberculosis without HIV infection, People with extrapulmonary TB of other than head and neck region, People with other opportunistic infections anywhere other than head and neck Keeping the social stigmas in mind, Patients' identity was not disclosed, Patient were referred by their ART number, and not by name, Patients were not bounded and he/she could leave the study anytime during the entire study period.

Methodology:

After complete Ear nose throat and head and neck examination, following tests were done : chest x ray A-P view, ultrasonography neck, sputum for AFB, culture and sensitivity, CD4++ cells.

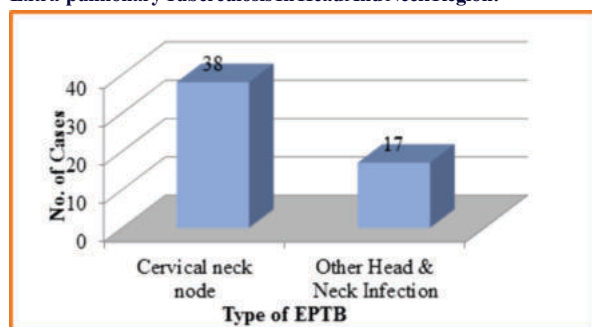
Patients followed up 3 months, 6 months and 12 months. Patients who were newly diagnosed were followed up for this period and the patients who were previously diagnosed they were followed up after the completed time period, and followed up from between. There previous data were obtained from their ART centre files and were noted. All the required data analysis was performed using IBM SPSS version 20 software. Tables are prepared using frequency distribution and cross tabulations. Quantitative data was expressed as mean and standard deviation whereas categorical data was expressed as number and percentage. Two means were compared using student paired 't' test

whereas percentage was compared using chi square test. A p value of <0.05 was considered as significant.

OBSERVATIONS AND RESULTS:

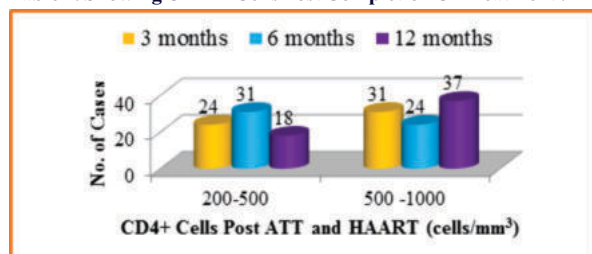
After performing detailed ENT examination and history, patients were retrospectively analysed and details were noted. 20-40 years was the mean age of the population and most common occupation among the subjects were driver in males and housewives in females. Most common extrapulmonary site was found to be cervical lymph nodes. 60% subjects had high CD4++ cells count i.e. >500 cells/mm³. It was observed that CD4++ cells count increased in 85% cases post HAART and ATT combined therapy. 78% cases resolved with EPTB after complete treatment.

Table 1 : Showing Cervical Lymphadenopathy As The Most Common Extra-pulmonary Tuberculosis In Head And Neck Region:



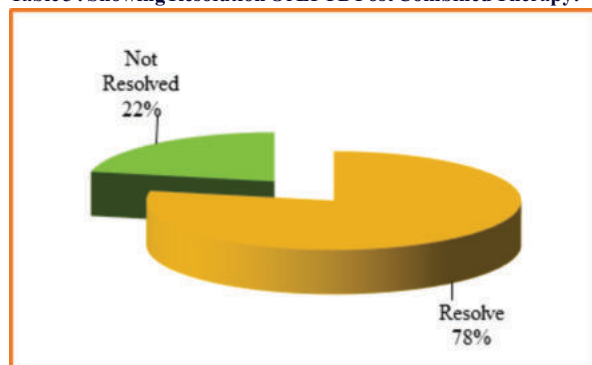
In table 1 we have found that cervical lymph node is the most common type of extrapulmonary tuberculosis in head and neck region. Other regions were parotid gland, pre-auricular region, post auricular abscess.

Table 2: Showing CD4++ Cells Post Completion Of Treatment :



In table 2, we have found that the number of CD4+ cells are represented after the treatment of HAART and ATT. It is observed that there is rise in CD4+ cells number post 12 months treatment of HAART and ATT.

Table 3: Showing Resolution Of EPTB Post Combined Therapy:



In table 3, we have found that the treatment outcome of extrapulmonary tuberculosis after complete treatment of ATT along with HAART. It has been observed there is resolution of extrapulmonary tuberculosis after treatment showing that higher CD4+ cells can lead to resolution of extrapulmonary tuberculosis by sputum negativity.

TABLES:

Table 4 : Association Between Type Of EPTB & CD4+ Cell At

Diagnosis.

Type of EPTB	CD4+ cell at diagnosis				Total	
	500 -1000		> 1000			
	No.	%	No.	%	No.	%
Cervical neck node	14	56.0%	24	80.0%	38	69.1%
Other Head & Neck Infection	11	44.0%	6	20.0%	17	30.9%
Total	25	100.0%	30	100.0%	55	100.0%

Pearson Chi-Square = 3.678, df = 1, **p value = .05***, Significant Fisher's Exact Test = .080

Table 4 is made by finding the most common type of extrapulmonary tuberculosis in head and neck region and the number of CD4+ cells at diagnosis. It is found from the relation that the cervical lymph nodes are found to be most common region of extrapulmonary tuberculosis in head and neck region in HIV patients with adequate number of CD4+ cells.

The relation was found to be statistically significant with p value of 0.05 thus concluding that cervical lymph nodes are the most common site of head and neck extrapulmonary tuberculosis in HIV patient.



Fig 1: Figure Showing Infected Cervical Lymph Node In HIV Positive Patient

Association Between CD4+ Cell Post Treatment And Outcome Of Extrapulmonary Tuberculosis:

Table 5:

CD4+ Cells Post ATT and HAART 12 Months	Treatment Outcome On EPTB				Total	
	Resolve		Not Resolved			
	No.	%	No.	%	No.	%
200-500	18	41.9%	0	0.0%	18	32.7%
500 -1000	25	58.1%	12	100.0%	37	67.3%
Total	43	100.0%	12	100.0%	55	100.0%

Pearson Chi-Square = 7.467, df = 1, **p value = .006**, Significant . Fisher's Exact Test = .005

In table 5 we have found that treatment outcome following HAART and ATT combined on the basis of CD4+ cells counts. It has been observed that after completion of treatment, the amount of CD4+ cells after at 12 months of treatment, 43 patients out of 55 patients were reported sputum negative after the treatment, and 12 patients out of 55 were reported repeat positive after the treatment. The relation was statistically significant, With p value 0.006. It is observed in the study that treatment combination is helpful in sputum negativity.

DISCUSSION:

The study was conducted in otorhinolaryngology department of Gandhi Medical college, Bhopal. Patients were taken into

consideration who came to ENT OPD directly or indirectly from ART center. In our study a total of 55 patients were studied. Distribution was according to age groups, occupation, family history, blood transfusion history, addiction history and radiological and sputum findings. The confidentiality and ethical issues were kept in mind and were strictly followed. No name is disclosed and no information is shared to other patient.

Common Site For Extrapulmonary Tuberculosis :

In this study most common site of extrapulmonary tuberculosis was Cervical lymphadenopathy (69.1%) cases. Similarly in study of Cbem et al out of 157 cases 71 cases (45.2%) were having cervical lymph nodes enlargement.⁴ Another study of John Mouza et al showed cervical lymphadenopathy as the commonest ailment in HIV-extrapulmonary tuberculosis coinfection with 81 patients (57.8%) positive out of 140 subjects.⁵

Correlation Of CD4+ Cells Count At Diagnosis And Incidence Of EPTB:

In this it is seen that the patients with high CD4+ cells counts i.e., > 500 cells/mm³ at the time of diagnosis responses better to the treatment than the one with low CD4+ cell counts at diagnosis i.e., <200 cells/mm³. In our study maximum cases were with CD4+ cells >1000 cells/mm³ at diagnosis and after treatment these patients had the ability to resolve the extrapulmonary tuberculosis. Similarly in study by R.A.G. KHAMMISSA et al it was found that the HIV seropositive cases with very low CD4+ cells are more frequent in having extrapulmonary tuberculosis then the one having high CD4+ cells.⁶ another study was conducted by PENELOPE K ELLIS et al in which there was increase in tuberculosis incident in patients with reduced CD4+ cells counts.⁷ Study by BRENDA JONES et al also concluded the relation of CD4+ cells count and extrapulmonary tuberculosis risk.⁸ (see table 6)

Table 6: Showing Comparison Of CD4+ Cells At Diagnosis And Incidence Of EPTB

	CD4+ CELLS at diagnosis	Incidence of EPTB
BRENDA JONES et al 1993	200-500 cells /mm ³	Very high
R.A.G. KHAMMISSA et al 2010	500- 1000 cells /mm ³	Low
PENELOPE K ELLIS et al 2017	< 500 cells /mm ³	Very high
OUR STUDY 2020	500- 1000 and >1000 cells /mm ³	Low

CD4+ Cells Post Treatment (HAART And ATT):

In our study, the CD4+ cells were measured after the treatment of HAART and ATT after 3 months, 6 months and 12 months. In this study CD4+ cells counts were seen which were not much altered during the treatment of 3 months, but at the end of combined treatment of ATT and HAART for 6 months and 12 months, CD4+ cells counts somewhat increases in 48 out of 55 patients (87%) and in 7 out of 55 patients CD4+ cells count decreased. In study by A WANCHU et al, 9 patients were divided into 4 groups on the basis of CD4+ cells number in which 2 groups were given only Anti-retroviral therapy and other 2 groups combined therapy. It has been observed that patient getting both ART and ATT have better prognosis and increase in CD4+ cells counts. Another study by IRA L LEEDS et al in 2012, improvement in CD4+ cell counts is been noticed after therapy in previously healthy patient without any co-morbidity. Similarly in study conducted by JONATHAN DRAKE BISHOP et al in 2016, after initiation of anti-retroviral therapy, there is increase in CD4+ cells counts.¹¹ (See Table 7).

Table 7: Showing Increment In CD4+ Cells Post Treatment

STUDIES	TREATMENT OF ART AND ATT	CD4+ CELLS
A WANCHU et al 2010	ATT +ART	Increased
IRA L LEEDS et al 2012	ATT + ART	Increased
JONATHAN DRAKE BISHOP et al 2016	ART	Increased
OUR STUDY	ART +ATT	Increased

RESOLUTION OF EXTRAPULMONARY TUBERCULOSIS AFTER COMBINED TREATMENT:

In this study resolution of

extrapulmonary tuberculosis is being measured after the combined therapy of ART and ATT. In our study there were 78.2 % cases who reported negative of CBNAAT after the combined treatment, and rest 21.8% remained sputum positive even after treatment. In study by C. Padma Priyadarshini 12 there is rise in CD4+ cells after combined therapy. This shows that the anti-retroviral therapy somehow intensifies the efficacy of ATT.

CONCLUSION:

TAKE HOME MESSAGE:

- It is important to do CD4+ cells count at diagnosis, so that the disease prevalence is known and high-risk population can be monitored.
- Its best to start ATT along with HAART as soon as possible to get the better outcome and improvement in quality of life of the patient.
- Serial monitoring of CD4+ cells count is beneficiary for monitoring the prognosis of disease.

LIMITATIONS:

- Being a social stigma, HIV patients tends to hide their symptoms and frequently lose to follow up.
- Due to covid pandemic, there was difficulty in tracing patients and collecting data.
- By combined therapy, less compliance was difficult to deal with.

Conflict Of Interest :

Authors declared. There is no conflict of interest.

Ethical Issues:

This study was ethical approved by Institutional Ethical Committee

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