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Prevalence of Clinical Tuberculosis in HIV Infected Patients from Kermanshah Province, IRAN

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ABSTRACT

Background: *Tuberculosis is a common infection among HIV positive patients. It causes a lot of obstacles in diagnosis, and it can significantly affect the course of HIV infection.*

Materials and Methods: *Between March 1997 and April 2001, we evaluated the rate of clinical tuberculosis among 638 HIV positive patients in Kermanshah province in IRAN. The study population was consisted of HIV infected patients who had been received anti tuberculosis drug regimen. Medical records of the patients were reviewed for age, gender, marital status, clinical presentation, infection source, and treatment outcome.*

Results: *Clinical tuberculosis was observed in 73 (11.4%) HIV- infected patients, 80.9% of whom were smear-positive, 10.9% were smear-negative, and the remaining 8.2% revealing to have extra-pulmonary tuberculosis. The patients were adapted to anti tuberculosis treatment with a cure rate of about 80%.*

Conclusion: *The prevalence rate of clinical tuberculosis is high but underestimated, and it seems to be due to vulnerability of our patients to tuberculosis in the setting of intravenous drug usage as a major underlying factor for HIV among infected individuals and also residence in prisons due to illegal drug consumption. (**Tanaffos 2002; 1(2): 27-33**)*

Key words: *Tuberculosis, HIV infection, IV-drug abuser*

INTRODUCTION

Tuberculosis is a common infection among HIV positive individuals. Almost one third of HIV infected patients have tuberculosis concomitantly (1). The rate of infection differs among the population residing in different geographical regions, depending on the rate of tuberculosis in the community (1,2).

In the regions of high prevalence of tuberculosis, mycobacterium tuberculosis is the leading cause of mycobacterial infections while in the region of low prevalence, atypical mycobacteria particularly "Mycobacterium Avium-Complex "(MAC) is more common (3,4). Tuberculosis plays important roles in HIV-infected patients who deserve special consideration (5). The clinical picture of tuberculosis is somewhat different in this group in comparison with HIV-negative population, particularly in advanced phases of infection which is manifested as atypical radiologic findings like the miliary pattern,

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mediastinal lymphadenopathy, pleural effusion, and high incidence of extra pulmonary involvement (6-13).

The diagnosis of tuberculosis is more difficult in HIV-positive patients due to lack of cavitary lesions in advanced stages which cause a paucibacillary state in sputum(14-18); thus, high clinical suspicion and further evaluations through radiologic studies, pathologic examination of the biopsy specimens, and other methods must be employed to prevent misdiagnosis of the patients (19-22).

Clinical tuberculosis was developed more rapidly in this group; 7 to 10% of HIV-infected patients develop tuberculosis each year, while this risk is totally 10% during life time in non-HIV infected population (23-26).

It is believed that the rate of multi drug resistant mycobacterium tuberculosis is higher in HIV-infected patients. It leads to multiple difficulties in the treatment of tuberculosis (27-29).

To evaluate the prevalence rate of clinical tuberculosis in HIV-infected patients, the present study was conducted in Kermanshah province in Iran between March 1997 and April 2001.

MATERIALS AND METHODS

In this study, we collected the available data from medical records of all HIV-positive patients receiving treatment for tuberculosis in a HIV clinic since March 1997 till April 2001.

The diagnosis was confirmed by positive sputum smear for BK, radiologic and pathologic studies. Two serial ELISA tests and Western blots were used to confirm the HIV positivity. Different variables including age, sex, marital status, clinical manifestations, route of HIV transmission, type of tuberculosis based on the presentation (new case, relapse, drug resistance), drug regimen, outcome, and mortality were all determined. Chi-square was applied to analyze the data. Statistical significance was specified at p= 0.05.

RESULTS

A total of 638 HIV- positive patients were studied, 73 of them (11.7%) had a concomitant tuberculosis infection (Table 1).

47(64%) out of 73 TB/ HIV infected patients were 20-40 years old and 26(36%) were 41 years old or more (Table 2).

Only 6.9% of TB/HIV infected patients were married; thus, unmarried HIV-positive patients developed TB 13.6 times as likely as married individuals. This rate was 34.7% in all HIV- infected patients.

Table 1. Prevalence of clinical TB in HIV- positive patient, Kermanshah, Iran

Gender	Tuberculosis	
	Positive	Negative
Male	73	557
Female	0	8
Total	73(11.4%)	565(88.6%)

Table 2. Age distribution of HIV-positive patients according to the presence of TB, Kermanshah, Iran

Age group(years)	Tuberculosis	
	Positive(%)	Negative(%)
<20	0	2(0.4)
20-40	47(64)	369(65.3)
>40	26(36)	194(34.3)
Total	73	565

Among 73 TB/HIV cases, 59 (80.9%) had smear-positive pulmonary tuberculosis; 8 (10.9%) had smear-negative pulmonary tuberculosis; and 6 (8.2%) had extrapulmonary tuberculosis consisting of 3 cases of TB lymphadenitis, one pleural TB, one TB meningitis, and one liver tuberculosis. Therefore, the

most common extraplumonary sites involved were lymph nodes.

Totally, smear-positive pulmonary tuberculosis was the most common type of TB recognized in HIV-infected patients ($P<0.05$). All TB/HIV cases (co-infected cases) had a previous history of residence in prison before diagnosis. Regarding the geographical distribution, 64 of co-infected cases (87.5%) have resided in Kermanshah city and the remaining 9 cases (12.5%) have belonged to Harsin, a small town near Kermanshah.

Of 73 TB/HIV cases, 61(83.5%) were newly diagnosed cases (new cases) while 12 (16.5%) had a previous history of TB treatment (relapse). Figure 1 shows the results of anti-TB treatment and the patients' outcome.

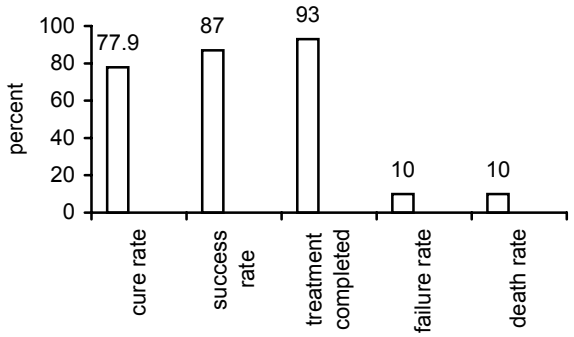

Figure 1. The treatment outcome of anti -TB in TB/HIV cases.

DISSCUSSION

The results revealed that, 11.4% of HIV-positive patients in Kermanshah province had tuberculosis. This is higher than other reports. In a study conducted in Quebec, Canada, during seventeen years (1979-1996), 242 out of 4684 (5.2%) HIV-infected patients confirmed clinical tuberculosis (30), which is higher than other parts: 1.6% in Ontario (31), 3.4% in British Colombia (32), and 1.4% in Colbra (33). It was higher than the 5% observed prevalence in USA (34), but less than 19.2% of the European result (35). The rate of clinical tuberculosis in HIV-infected patients in our study was significantly more than the estimated rate of tuberculosis in the Iranian general population (11,400/100,000 vs. 30/100,000).

In the present study, there is a significant predominance of tuberculosis in male individuals partly due to the higher rate of males infected with HIV, the vast majority of whom were IV-drug abusers and had previous history of long residence in prison, which facilitated transmission of mycobacterium tuberculosis.

In a Canadian study, 24.8% of TB/HIV cases were female and the relative risk of tuberculosis in females was three times more than males (30). In another study performed in Canada, the rate of tuberculosis in HIV- infected males was 4% compared to 13% of females (35).

In our study, the majority of TB/HIV patients were 20 to 40 years old (64.38%), but the relative risk of tuberculosis in this age group did not differ from that of the elder ones (13.4% vs. 12.9%).

This is contrary to the usual expectation of higher tuberculosis prevalence in the elderly due to reactivation. Furthermore, it seems that HIV-infection per se, as a predisposing factor, is more important than age. Some of our important findings are the high prevalence of pulmonary (91.8%), a lower rate of extrapulmonary tuberculosis (8.2%), and also a high rate of smear-positive pulmonary disease (80.9%). This result is in contrast to other studies (36). In a study conducted in Spanish prisons, the rate of pulmonary tuberculosis in HIV-infected patients was 57% and the remaining cases were extrapulmonary or disseminated tuberculosis (18). In another study the rate of sputum smear-positivity in pulmonary tuberculosis of HIV-infected patients was significantly lower than non-HIV cases (45% vs. 81%) (17).

Paul Brasale et al. have demonstrated 47.2% pulmonary, 35.3% extrapulmonary, and 17.5%

pulmonary as well as extrapulmonary TB in their patients (30).

The reason for this discrepancy may be due to underestimation of extrapulmonary tuberculosis or the disseminated type in the presence of pulmonary manifestations. This can be due to the priority of diagnosing pulmonary tuberculosis patients in the field of clinics and low attention to concomitant pulmonary as well as extrapulmonary cases. We believe that, the rate of pulmonary tuberculosis could be higher if sputum culture for mycobacterium tuberculosis was performed routinely.

Furthermore, with respect to the annual risk of clinical tuberculosis in HIV-infected patients which was estimated to be about 7.9%, following our four-year study, we expected to have a prevalence rate of 31.6% for TB which was 2.5 times more than our result. This can be explained primarily by our disability in case finding either pulmonary or extrapulmonary patients, and secondarily due to prophylaxis program, which was done for the majority of HIV-infected PPD positive patients in our center (36). The efficacy of anti-TB treatment was 79% in our study, since 58 out of 73 cases had sputum conversion or clinical and radiologic improvement. The treatment was four-drug regimen for new cases and five-drug regimen for relapsed patients.

The researchers believe that the result is reasonable, considering that the most of the patients were IV-drug abusers. Moreover, we predicted to have a lot of treatment failures due to psychosocial problems leading to non-compliance with the treatment.

We conclude that tuberculosis is a common infection in HIV-positive patients. We also insist on considering tuberculosis in this high risk group and emphasize to identify the latent infection by PPD testing as well as prevention by chemoprophylaxis.

Meanwhile, we believe that the rate of tuberculosis in HIV-infected patients in Iran must be higher than other communities due to the major underlying factor of intravenous drug abusing as an important route of transmission for HIV among residence in prisons for illegal drug abusing and marketing which favors tuberculosis transmission.

Finally, we suggest to optimize the diagnosis of tuberculosis in HIV-positive patients in our community by improving the laboratory facilities, enforcing the standard methods of case finding; applying appropriate treatment to inhibit the spread of tuberculosis as a potent communicable infection, and increasing the survival rate and quality of life in HIV-positive patients. Further studies are highly recommended in our country to evaluate the clinical, radiologic, and immunologic features of TB/HIV-infected patients.

REFERENCES

1. Sudre P, Ten Dam G, Chan C, et al. Tuberculosis in the present time: a global overview of the tuberculosis situation. ***WHO/TUB*** 1991; 158:1-47.
2. UNAIDS/WHO. Report on the global HIV/AIDS epidemic. ***Lancet*** 1997; 350:1683.
3. Nightingale SD, Byrd LT, Southern PM, et al. Incidence of Mycobacterium avium-intracellular complex bacteriemia in human immunodeficiency virus-positive patients. ***J Infect Dis*** 1992; 165(6):1082-5
4. Chaisson RE, Moore RD, Richman DD, et al. Incidence and natural history of Mycobacterium avium-complex infections in patients with advanced human immunodeficiency virus disease treated with zidovudine. *The zidovudine Epidemiology study group.* ***Am Rev Respir Dis*** 1992; 146(2):285-9.
5. Iseman MD. ***A clinicians guide to tuberculosis.*** Philadelphia: Lippincott Williams and Wilkins***;*** 2000.p. 206.
6. Alpert PL, Munsiff SS, Gourevitch MN, et al. A prospective study of tuberculosis and human

immunodeficiency virus infection: clinical manifestations and factors associated with survival. ***Clin Infect Dis*** 1997; 24 (4): 661-8.

7. Mukadi Y, Perriens JH, St Louis ME, et al. Spectrum of immunodeficiency in HIV-1-infected patients with pulmonary tuberculosis in Zaire. ***Lancet*** 1993; 342(8864): 143-6.
8. Jones BE, Young SM, Antoniskis D, et al. Relationship of the manifestations of tuberculosis to CD4 cell counts in patients with human immunodeficiency virus infection. ***Am Rev Respir Dis*** 1993;148(5):1292-7.
9. Fischl MA, Daikos GL, Uttamchandani RB,et al. Clinical presentation and outcome of patients with HIV infection and tuberculosis caused by multiple-drug–resistant bacilli. ***Ann Intern Med*** 1992; 117(3):184-190.
10. Keiper MD, Beumont M, Elshami A, et al. CD4 T-lymphocyte count and the radiographic presentation of pulmonary tuberculosis. A study of the relationship between these factors in patients with human immunodeficiency virus infection. ***Chest*** 1995; 107(1):74-80.
11. Batungwanayo J, Taelman H, Dhote R, et al.Pulmonary tuberculosis in Kigali, Rwanda. Impact of human immunodeficiency virus infection on clinical and radiographic presentation. ***Am Rev Respir Dis*** 1992: 146(1):53-6.
12. Long R, Scalcini M, Manfreda J, et al. Impact of human immunodeficiency virus type 1 on tuberculosis in rural Haiti. ***Am Rev Respir Dis*** 1991; 143(1): 69-73.
13. Eriki PP, Okwera A, Aisu T,et al. The influence of human immunodeficiency virus infection on tuberculosis in Kampala, Uganda. ***Am Rev Respir Dis*** 1991; 143(1): 185-7.
14. Klein NC, Duncanson FP, Lenox TH, et al. Use of mycobacterial smears in the diagnosis of pulmonary tuberculosis in AIDS/ARC patients. ***Chest*** 1989;95(6):1190-2.
15. Elliott AM, Luo N, Tembo G, et al. Impact of HIV on tuberculosis in Zambia: a cross sectional study. ***BMJ*** 1990; 301(6749):412-5.
16. Elliott AM, Namaambo K, Allen BW, et al. Negative sputum smear results in HIV-positive patients with pulmonary tuberculosis in Lusaka, Zambia. ***Tuber Lung Dis*** 1993; 74(3):191-4.
17. Long R, Scalcini M, Manfreda J, et al. The impact of HIV on the usefulness of sputum smears for the diagnosis of TB. ***Am J Public Health*** 1991; 81(10);1326-8.
18. Chaves F,Dronda F,Gonzalez lopez A,et al.Tuberculosis in prison population: study of 138 cases. ***Med Clin(Barc)*** 1993; 101(14); 525-9.
19. Kramer F, Modilesky T, Waliany AR, et al. Delayed diagnosis of tuberculosis in patients with human immodeficiency virus infection. ***Am J Med*** 1990; 89(4): 451-6.
20. Murray JF, Mills J. Pulmonary infectious complications of human immunodeficiency virus infection. Part I. ***Am Rev Respir Dis*** 1990; 141(5pt1): 1356-72.
21. Martinez-Marcos FJ, Viciana P, Canas E, et al. Etiology of solitary pulmonary nodules in patients with human immunodeficiency virus infection. ***Clin Infect Dis*** 1997; 24(5): 908-13.
22. Nelson JE, Forman M. Hemoptysis in HIV-infected patients. ***Chest*** 1996; 110(3):737-43.
23. Di Perri G, Cruciani M, Danzi MC, et al. Nosocomial epidemic of active tuberculosis among HIV-infected patients. ***Lancet*** 1989; 2(8678-8679):1502-4.
24. Daley CL, Small PM, Schecter GF, et al. An outbreak of tuberculosis with accelerated progression among persons infected with the human immunodeficiency virus. An analysis using restriction- fragment- length polymorphisms. ***N Engl J Med*** 1992; 326(4): 231-5.
25. Guelar A,Gatell JM, Verdejo J, et al. A prospective study of the risk of tuberculosis among HIV-infected patients. ***AIDS*** 1993; 7(10):1345-9
26. Antonucci G, Girardi E, Raviglione MC, et al. Risk factors for tuberculosis in HIV-infected persons: a prospective cohort study. *The Group Italiano di Studio Tubercolosi e AIDS (CISTA).* ***JAMA*** 1995; 274(2): 143-8.

27. Centers for Disease Control. Nosocomial transmission of multidrug-resistant tuberculosis among HIV-infected persons- Florida and New York, 1988-1991. ***MMWR*** 1991; 40: 585-91.

28. Fischl MA, Uttamchandani RB, Daikos GL, et al. An outbreak of tuberculosis caused by multiple-drug-resistant tubercle bacilli among patients with HIV infection. ***Ann Intern Med*** 1992; 117(3): 177-83.

29. Abouya L, Coulibaly IM, Coulibaly D, et al. Radiologic manifestations of Pulmonary tuberculosis in HIV-1 and HIV–2–infected patients in Abidjan, Cote d' Ivoire. ***Tuber Lung Dis*** 1995; 76(5): 436-40.

30. Brassard P,Remis RS. Incidence of TB among reported AIDS cases in Quebec from 1979 to 1996. ***CMAJ*** 1999; 160(13):1838-42.

31. Ofner M.Tuberculosis and AIDS in Ontario-a record linkage. ***Public Health Epidemiol Rep Ont*** 1993; 11(19):330-3.

32. Korzeniewska- Kosela M, FitzGerald JM, Vedal S, et al. Spectrum of tuberculosis in patients with HIV infection in British Columbia: report of 40 cases. ***CMAJ*** 1992; 146(11): 1927-34.

33. Jones JL, Burwen DR, Fleming PL, et al. Tuberculosis among AIDS patients in United States, 1993. ***J Acquir Immune Defic Syndr Hum Retroviral*** 1996; 12(3): 293-7.

34. European Center for the epidemiological monitoring of AIDS. ***HIV/AIDS surveillance in Europe***: quarterly report Saint Maurice (France). WHO 1995. p.69-73.

35. Murray JF. The white plague: down and out, or up and coming. ***Am Rev Respir Dis*** 1989; 140(6): 1788-95.

36. Barnes PF, Bloch AB, Davidson PT, et al. Tuberculosis in patients with advanced human immunodeficiency virus infection. ***N Engl J Med*** 1991; 324(23): 1644-65.