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ORIGINAL ARTICLE

Frequency of Extrapulmonary Tuberculosis among Human Immunodeficiency Virus (HIV) Patients at Lady Reading Hospital, Peshawar

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ABSTRACT

Background: Human immunodeficiency virus/acquired immunodeficiency syndrome (AIDS) has now infected nearly 80 million people around the world since it first appeared. The HIV epidemic has had a profound effect on the global tuberculosis (TB) crisis attributing to 20% of all AIDS-related deaths. Less than one-tenth of one percent of Pakistan's population was estimated to have HIV. However, Pakistan has gone from having a low HIV prevalence to a high HIV epidemic. Pakistan is the sixth most problematic country in the world for TB because it accounts for about 63% of the TB load in the Eastern Mediterranean Region.
Aim: To determine the prevalence of extrapulmonary tuberculosis among HIV patients.
Study design: Prospective, cross-sectional study.
Place and duration of study: Department of Medicine, Lady Reading Hospital, Peshawar from 17th April 2020 to 16th October 2020.
Methodology: Seventy eight HIV patients were recruited to determine the frequency of extrapulmonary tuberculosis.
Results: There were 34.6% males and 65.4% females with mean age was 45.44±5 years. The frequency of extrapulmonary tuberculosis in HIV was found to be 44.9%.
Conclusion: Extrapulmonary tuberculosis is a significant problem among human immunodeficiency virus patients.
Key words: HIV, Extrapulmonary tuberculosis, Pakistani patients

INTRODUCTION

HIV/AIDS has now infected nearly 80 million people around the world since it first appeared.[1] According to the WHO, as a result of this virus, 36.3 million people have died.[2] By the year 2020, an estimated 37.7 million individuals around the latent TB, HIV co-infection increases their susceptibility to primary infection or reinfection, as well as the likelihood of TB reactivation.[3-5] Because of its high contagiousness, pulmonary mode of transmission, and potential for the prevention of chemoprophylaxis, tuberculosis linked with HIV infection has a high prevalence rate[6].

A recent comprehensive study and meta-analysis of autopsy results of HIV-infected persons revealed that tuberculosis accounted for around 46% of AIDS-related adult deaths, with over half of these being misdiagnosed at the time of death[7]. In 2018, HIV-positive status is linked to a greatly higher risk of extrapulmonary TB, with the meninges being the most usually affected region[8]. The strong link between HIV virion with neuromeningeal tuberculosis is also revealed in many other studies[9,10].

A systematic review of 16 research (15 cross-sectional and 1 case-control) published between 1984 and 2016 institute a link between HIV and extrapulmonary tuberculosis.[3] In Pakistan, less than one-tenth of one percent of Pakistan's population was estimated with HIV (183,705 HIV people in 212 million population)[11]. However, Pakistan has gone from having low HIV prevalence to a high HIV epidemic[12]. Pakistan is the sixth most problematic country in the world for TB because it accounts for about 63% of the TB load in the Eastern Mediterranean Region.[13] Researchers in Pakistan found that TB patients are three times more likely than the general population to become infected with HIV.[14] With tuberculosis widespread in Pakistan and HIV prevalence on the rise, it's critical to understand the prevalence of extrapulmonary tuberculosis among HIV patients in the local population; yet, information is scarce. This study aims to expand the local community's understanding of the epidemiology of HIV-related extrapulmonary tuberculosis, which may aid health professionals in preventing and diagnosing extrapulmonary tuberculosis in HIV patients. World would be infected with HIV[1,2].

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The HIV epidemic has had a profound effect on the global TB crisis attributing to 20% of all AIDS-related deaths[3]. According to a WHO fact sheet (2017), tuberculosis was the leading cause of AIDS-related deaths, accounting for nearly 300,000 deaths[4].

The objective of the study was to determine the prevalence of extrapulmonary tuberculosis among HIV patients.

MATERIALS AND METHODS

The observational, prospective, cross-sectional was conducted at Department of Medicine, Lady Reading Hospital, Peshawar from 17th April 2020 to 16th October 2020 and comprised 78 patients. The patients of both genders having ages of 15 to 50 years patients with known prescreened HIV infections for the past 6 months were included. Patients not willing to participate and HIV-positive patients having only pulmonary TB were excluded.

All patients were informed about the nature and purpose of the study and informed consents were obtained. The patients were evaluated, and selection was made based on inclusion/exclusion criteria. The details regarding patient demographics, vital signs (Including body temperature, respiratory rate, and blood pressure), relevant medical history, systemic examination, temperature, concomitant medications, study medication were recorded in the case report form (CRF). The diagnosis of HIV-positive status was made on a positive ELISA test. All patients were managed according to the standard care received by patients who presented with HIV. Patients with MRI findings of meningeal enhancement or ring-enhancing lesion were followed by a lumbar puncture for diagnosis of neuromeningeal tuberculosis. The patients with pleural involvement on X-ray chest were followed by pleural fluid aspiration along with biopsy for diagnosis of pleural tuberculosis. Abdominal tuberculosis was diagnosed with ultrasound abdomen findings of intestinal wall thickening along with enlarged mesenteric lymph nodes which were biopsied for confirmation. Patients presented with backache or tenderness in the spine with or without neurological symptoms in the lower limbs were advised MRI spine with contrast and intervertebral discs involvement cases were referred to the neurosurgical unit for biopsy. Pleural TB was diagnosed with pleural biopsy showed caseous necrosis on histopathology or AFB on culture. Gastrointestinal TB was diagnosed with a biopsy of tissue obtained during endoscopy of the bowel showed caseous necrosis on histopathology or AFB on culture. Abdominal TB was diagnosed if intra-abdominal lymph

node biopsy showed caseous necrosis on histopathology or AFB on culture. Bone TB was diagnosed if the bone biopsy shows caseous necrosis on histopathology or AFB on culture. Neuromeningeal tuberculosis was diagnosed by a CSF analysis showing all of the following: raised protein, low glucose, and increased cell count with a predominance of lymphocytes. The data was analyzed using SPSS-23. Post-stratification chi-squared test was applied in which a p-value of <0.05 was considered significant.

RESULTS

Table 1: Demographic information of HIV patients (n=78)

Variable	No.	%
Gender		
Male	27	34.6
Female	51	65.4
Age (years)		
15 – 22	11	14.1
23 – 29	18	23.1
30 – 36	20	25.6
37 – 43	17	21.8
44 – 50	12	15.4
Duration diagnosis (months)		
1 – 3	36	46.2
3 – 6	42	53.8
Body mass index (kg/m²)		
18.5-24.9 (Normal weight)	24	30.8
25-29 (Overweight)	31	39.7
30-34.9 (Class-1 obesity)	13	16.7
35-39.9 (Class-II obesity)	10	12.8

Table 2: Frequency of sites of extrapulmonary tuberculosis (n=78)

Variable	No.	%
Extrapulmonary tuberculosis		
Positive	35	44.9
Negative	43	55.1
Pleural TB		
Yes	15	19.20
No	63	80.80
Neuromeningial TB		
Yes	10	12.8
No	68	87.2
Gastrointestinal TB		
Yes	7	9.0
No	71	91.0
Bone TB		
Yes	3	3.8
No	75	96.2

Table 3: Comparison of extrapulmonary tuberculosis according to gender, age, duration f diagnosis and body mass index

Variable	Extrapulmonary tuberculosis		P value
	Positive	Negative	
Gender			
Male	12	15	0.251
Female	23	28	
Age (years)			
15 – 22	4	7	0.517
23 – 29	11	7	
30 – 36	7	13	
37 – 43	7	10	
44 – 50	6	6	
Duration of diagnosis (months)			
1 – 3	19	17	0.194
3 - 6	16	26	
Body mass index (kg/m²)			
18.5 - 24.9	14	10	0.371
25 – 29.9	12	19	
30 - 34.9	6	7	
35 – 39.9	3	7	

There were 27(34.6%) males and 51(65.4%) females with mean age was 44.5±5 years. The frequency percentage was more prevalent between 30-36 years old (25.6%) [Table 1]. Extrapulmonary tuberculosis was found in 35(44.9%) of the HIV patients, with pleural TB 15(19.2%), neuromeningial TB 10(12.8%), gastrointestinal TB 7(9%) and bone TB 3(3.8%) [Table 2]. Table 3 shows the details of extrapulmonary tuberculosis stratification based on gender, age, duration, and BMI.

DISCUSSION

Tuberculosis is the leading opportunistic illness in HIV-positive individuals, driving the disease's spread across the globe, particularly in developing nations[15]. The probability of getting active tuberculosis in HIV-positive individuals is estimated to be 20-30 times higher than in HIV-negative people.[16] Globally, an estimation (WHO, 2015) of 1.2 million HIV contracted tuberculosis (TB), 19 times (17–22) more likely with Tuberculosis than those without HIV.[17] In TB-HIV, the total TB prevalence is 16 percent, however, the 30% of extrapulmonary TB seen in TB cases is significantly greater[18]. Extrapulmonary TB is widely documented to be more common in HIV patients[14,19]. HIV was linked to exclusively EPTB and any EPTB, according to Click et al.[21] Furthermore, the same study found that EPTB with concomitant pulmonary involvement had a stronger link to extrapulmonary disease than EPTB alone in those with HIV[21]. Our study results show the frequency of 44.9% involvement of extrapulmonary tuberculosis in HIV patients in the urban northern part of KPK, Pakistan. The local study reported the prevalence of HIV among TB Pakistani patients was found to be 0.34%, which is significantly lower than the global average of 12%.[22] In Asia and the Pacific, India, Indonesia, Myanmar, and Thailand are among the 41 nations with the greatest HIV–TB burden.[8] The local south Asian study by Kingkaew et al[23] presented that extrapulmonary tuberculosis occurred in 4% of HIV-infected individuals with Tuberculosis, especially in those with significant immune suppression. In the present study, females (65.4%) were exposed to extrapulmonary tuberculosis with HIV. Female gender demographics have previously been identified as risk factors for extrapulmonary TB[19,21,24].

After controlling for other confounding factors, Qian et al[25] discovered that female gender was related to individuals who only had EPTB. The study also revealed that the female gender was linked to lymphatic and peritoneal tuberculosis.[26] The link between extrapulmonary tuberculosis and female sex, which has been suggested in various studies to be attributable to women's differing exposure to infectious tuberculosis patients, smoking, and medical care when compared to men.[26] The previous local study endorsed the greater prevalence of extrapulmonary TB among females, however, the authors speculate that there may be a hereditary predisposition to extrapulmonary TB among indigenous ethnic populations.[15,27] The study data from the United States and Saudi Arabia opposes the local data, where Extra Pulmonary TB rates are relatively higher among male patients.[28,29]

Extrapulmonary TB has a wide range of clinical presentations depending on the region of involvement and the disease's aggressiveness.[30] In the case of the common site of extrapulmonary Tuberculosis associated with HIV infection, Lead et al demonstrated that the lymphocytic (28%) illness was the most common type of EPTB, followed by disseminated (23%), and CNS/meningeal (22 %).[19] In the other studies, the lymphatic system nodes and pleura were the most common locations of EPTB.[32,33] In a US study (North Carolina), the cervical lymphatic location was shown to be more common among foreign-born EPTB patients than among US-born patients.[32] The other US studies revealed that Pleural TB is the second most prevalent kind of EPTB, however, it is the most common presentation in TB-endemic area.[33,34] In our country TB exits as an endemic condition, our study results showed that the pleural TB 19.2 % (n=15) was the most common, followed by neuromeningial TB 10(12.8%), gastrointestinal TB 9% (n=07), and bone TB 3% (n=3.8) respectively.

In this study, HIV patients with extrapulmonary TB had normal BMI (40%), overweight (34.3%), and obesity (25.7%).

However, the low BMI and falling BMI are the important factors of tuberculosis risk are identified in Maro et al[35] research study. They reported that BMI 17 kg/m2 and a decrease in BMI of 0.5 kg/m2 were linked to an increased risk of tuberculosis, whereas the risk of TB is substantially higher among HIV-positive adults who have a low or declining BMI. HIV-related malnutrition raises the risk of tuberculosis (TB) and exacerbates the risk of increased mortality rate. Similarly, obese and overweight people have a lower chance of death and tuberculosis.[36] Shor et al[37] found an inverse relationship between BMI and mortality in HIV-positive intravenous drug users. Another US study by Shuter et al revealed that overweight individuals had slower disease progression and lower viral load among HIV-free AIDS-positive individuals.[38] Jones et al[39] endorses the Shuter et a study and linked the BMI level with slower disease progression, AIDS clinical symptoms, and lower risk of mortality among HIV-positive women. Multiple other studies' results reflected that higher BMI is associated with better survival outcomes in HIV patients without TB, and low BMI is a predictor of mortality even in individuals on ART[40-42].

CONCLUSION

Extrapulmonary tuberculosis is a significant problem among HIV patients. The high prevalence of tuberculosis in Pakistan necessitates an early screening for HIV in patients with extrapulmonary and pulmonary tuberculosis. The appropriate assessments significantly reduce the morbidity and mortality associated with TB with HIV in such immune-compromised patients.

Conflict of interest: Nil

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