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Original Research Article

Chemotherapy, dialysis and transplantation analysis among immunocompromised patients with focus on tuberculosis, syphilis, hepatitis B, C, HIV and chicken pox

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ABSTRACT

Immunodeficiency cases are a common cause of hospital deaths in hospitalized patients. Given the high prevalence of nosocomial deaths due to infection in immunocompromised patients, we aimed to evaluate Tuberculosis (TB), syphilis, hepatitis B and C, HIV and chickenpox in hospitalized immunocompromised patients, dialysis and Transplantation analysis of Shahid Sadoughi Hospital in 2017. This study was a descriptive cross-sectional study. The study population consisted of 100 patients with immunodeficiency admitted in chemotherapy, dialysis and transplantation wards of Yazd Shahid Sadoughi Hospital in 2017. Based on the obtained results, it could be concluded that HIV Ab, HCV Ab and HBS Ag tests are more prevalent in immunocompromised patients.

***Keywords*:** Immunodeficiency Patients, dialysis, transplantation, chemotherapy

INTRODUCTION

Immune deficiency means the malfunction of the immune system, making people susceptible to a variety of infections [1,2]. A healthy immune system protects the body against germs, bacteria, viruses and fungi and any foreign body that enters the body. When the immune system fails to function properly, the body is prone to a variety of infections. Immune deficiency can occur in both men and women and all ages [3,4]. Immune deficiency can be primary or secondary (acquired). Primary immune deficiency is

caused by congenital genetic defects, but secondary immune deficiency is caused by other diseases. The most famous secondary immunodeficiency is AIDS [5,6]. Among the primary immunodeficiencies, antibody deficiency is the most common type [7]. Patients with primary antibody deficiency are susceptible to a variety of bacterial infections [4]. These people need regular and continuous administration of the drug or immunoglobulin injections as well as antibiotics when needed [2,8].

The pathological basis of this group of diseases is the inability or inadequate quality of B lymphocytes to produce antibodies [9].

In fact, the lack of differentiation of B lymphocytes into bone marrow or peripheral lymphatic tissues for any reason can cause this. Viruses and fungi usually stimulate T cells. Infections caused by viruses or fungi, if repeated, can indicate defects in T cell defense [10]. Tuberculosis, syphilis, chickenpox, hepatitis B and C, and HIV are among the most common infectious diseases in immunocompromised patients [11]. Hepatitis, especially type C, in HIV patients will cause patients to move faster to chronic hepatitis, cirrhosis and liver malignancy [12-14]. Among bacterial infections, tuberculosis spreads through the air [8,15]. Most infections are asymptomatic and hidden. But usually out of every ten latent infections, one infection eventually progresses and becomes an active disease. If untreated, it kills more than 50% of people infected with it [9,16,17]. Most studies on the association of tuberculosis in immunocompromised patients are related to HIV patients. Also among the diseases associated with immunodeficiency, the incidence of syphilis was higher in men of the same sex than in other people. The reason for this is due to the high prevalence of HIV among homosexual men [18-20]. Immunodeficiency is one of the most common causes of hospital mortality in hospitalized patients [18].

Therefore, due to the importance of the subject, TB, syphilis, hepatitis B, C, HIV and chickenpox tests were evaluated in patients with immunodeficiency admitted in chemotherapy, dialysis and transplantation units of Shahid Sadoughi Hospital in 2017.

MATERIALS AND METHODS

This study was a descriptive cross-sectional and retrospective study. The study population consisted of 100 immunocompromised patients admitted to chemotherapy, dialysis and transplantation wards of Yazd Shahid Sadoughi Hospital in 2017.

This study is the result of a doctoral thesis with code 4555 registered in the Research

System of Yazd Shahid Sadoughi University of Medical Sciences.

The sampling method was easy or available sampling method. All patients with immunodeficiency admitted in chemotherapy, dialysis and transplantation wards of Yazd Shahid Sadoughi Hospital in 1396 were studied through census and patients with incomplete data were included. The study was excluded. Referring to the records of Shahid Sadoughi Hospital, patients admitted in these three wards in 1396 were separated and, using the records as well as telephone calls, information including age, sex, type of hospitalization, CBC, Duration of disease, Purified Protein Derivative (PPD), Venereal Disease Research Laboratory (VDRL), Varicella Zoster Virus (VZV) Ab, HBs Ag, HCV Ab and HIV Ab were recorded.

The study was conducted on the basis of checklists supplemented with the records of individuals by the researcher, and in accordance with the relevant researcher's commitment to safeguarding patient secrets in accordance with the Helsinki Treaty, the use of checklists was carried out solely for the purposes of the research and ethical considerations in this subject was followed.

The data were entered into SPSS software version 18 and analyzed using statistical methods including frequency distribution and analysis of variance, T-test and ANOVA. Significance level was considered to be 0.05.

RESULTS

In this study 100 immunocompromised patients with a mean age of 51.34 years, 58 of whom were male and 42 were female. The results of frequency of study variables (PPD Test, VDRL, VZV Ab, HIV Ab, HCV Ab, HBS Ag) show that in 100 patients studied, 71 (71 %) patients had no PPD test and 29 (29 %) had a PPD Test, In the case of VDRL, for 81 cases and for 19 cases, for VZV Ab all failed, for HIV Ab, 22 failed and 78 performed, for HCV Ab, 22 failed and 78 performed, and In the case of HBS Ag, 22 cases failed and 78 cases performed. Of the 71 subjects who did not undergo PPD testing, 49 (92.5 %) were in dialysis, 22 (75.9 %) were in chemotherapy and no transplants.

Results of the study on frequency of VDRL according to the type of hospital admission showed that out of 81 patients who did not perform VDRL, 52 (98.1 %) were in dialysis, 29 (100 %) were in chemotherapy and 0 were in transplantation. And. Significant relationship was found between frequency of VDRL according to type of hospital admission ($p = 0.00$) (Table 1).

Of the 100 VZV Ab patients, 53 (100 %) were in dialysis, 29 (100 %) were in

chemotherapy and 18 (100 %) were in transplantation. Also, of those who did not undergo HIV Ab testing, 22 (75.9 %) were admitted to the chemotherapy ward.

Regarding the frequency of HCV Ab and HBS Ag according to the type of hospital admission, 22 patients (75.9 %) were in chemotherapy ward.

The results of the study on the frequency of PPD Test by sex showed that out of 71 people who did not do PPD Test, 42 (72.4 %) were male and 29 (69 %) were female. Of the 81 patients who did not perform VDRL, 47 (81 %) were men and 34 (81 %) were female. Also, of the 100 individuals who did not undergo VZV Ab, 58 (100 %) were male and 42 (100 %) were female.

Results of the study on the frequency of HIV Ab by sex showed that out of 22 people who did not have HIV Ab, 8 (13.8 %) were male and 14 (33.3 %) were female (Table 2). The results of the above table were analyzed by Chi-Square test, with a p-value <0.05 indicating a significant statistical relationship between the frequency of HIV Ab by sex (p = 0.028).

The results regarding the frequency of HCV Ab by sex showed that out of 22 people who did not have HCV Ab, 8 (13.8 %) were male and 14 (33.3 %) were female (Table 3).

Table 1. Frequency of VDRL test according to the type of hospitalized ward

VDRL Test	**Hospitalized Ward**			
	Dialysis N (%)	**Transplantation N (%)**	**Chemotherapy N (%)**	**Total N (%)**
Not do	52 (98.1)	0 (0)	29 (100)	81 (81)
Do	1 (1.9)	18 (100)	0 (0)	19 (29)
Total	53 (100)	18 (100)	29 (100)	100 (100)
P-value	0.00			

Table 2. Frequency of doing HIV Ab test based on gender

Gender	**HIV Ab Test**		
	Not do N (%)	**Do N (%)**	**Total N (%)**
Male	8 (13.8)	50 (86.2)	58 (100)
Female	14 (33.3)	28 (66.7)	42 (100)
Total	22 (22)	78 (78)	100 (100)

Table 3. Frequency of HCV Ab test according to patient gender

Gender	**HCV Ab Test**		
	Not do N (%)	**Do N (%)**	**Total N (%)**
Male	8 (13.8)	50 (86.2)	58 (100)
Female	14 (33.3)	28 (66.7)	42 (100)
Total	22 (22)	78 (78)	100 (100)
P-value		0.03	

The results of the above table were analyzed by Chi-Square test, with P-value <0.05 indicating a statistically significant relationship between the frequency of HCV Ab by sex.

Results of the study on the frequency of HBS Ag according to patient gender showed that out of 22 people who did not have HBS Ag, 8 (13.8 %) were male and 14 (33.3 %) were female (Table 4). The results of the above table were also analyzed using Chi-Square test, with a p-value <0.05 indicating a significant statistical relationship between

the frequency of HBS Ag according to patient gender.

Table 4. Frequency of HBS Ag test according to patient gender

Gender	HBS Ag Test		
	Not do N (%)	**Do N (%)**	**Total N (%)**
Male	8 (13.8)	50 (86.2)	58 (100)
Female	14 (33.3)	28 (66.7)	42 (100)
Total	22 (22)	78 (78)	100 (100)
P-value		0.03	

DISCUSSION

The results of this study showed that out of 100 patients, 71 had PPD Test and 29 did VDRL, 81 did not, and 19 did not do VZV Ab. For HIV Ab, 22 failed and 78 performed, for HCV Ab, 22 failed and 78 performed, and for HBS Ag, 22 failed and 78 performed. There was a significant difference between the frequency of PPD Test, VDRL, HIV Ab, HCV Ab, HBS Ag according to the type of ward, and HIV Ab, HCV Ab, HBS Ag according to gender.

Most studies on TB, syphilis, hepatitis B, C, HIV, and chickenpox in immunocompromised patients have investigated the outcome and prevalence of these diseases in these patients.

In the study of 2011 in Qazvin, prevalence of hidden hepatitis B in hemodialysis patients was investigated. Results showed no significant relationship between hidden hepatitis B and sex, duration of hemodialysis and number of transfusions received, hepatitis C positive and Hbc-Ab positive [3].

The results of another study conducted in Guilan in 2003 to investigate the prevalence of hepatitis C and its risk factors in hemodialysis patients showed that there was a significant relationship between the duration of dialysis and the history of renal transplantation [6].

Sabour study of the predisposing factors of hepatitis C in hemodialysis patients in 2003 showed that the prevalence of infection and duration of dialysis ($p < 0.001$), history of transfusion ($p < 0.01$), and previous kidney transplant ($p < 0.001$) there was a direct and significant relationship between history of surgery ($p < 0.005$) [20].

The study of Aminzadeh in 2003 investigated the status of PPD tets in hemodialysis patients. The results of this study showed that there was a significant relationship between anergy skin test results and age. Also, 28.6 % of patients showed negative results for both first time and PPD tests [1].

A cohort study conducted in 2004 with the aim of examining the frequency of hepatitis C virus antibodies and related risk factors in dialysis patients showed that 10 patients (4.9 %) were positive for hepatitis C virus antibody. In this study duration of dialysis treatment ($p = 0.004$), history of kidney transplantation ($p = 0.032$) and being female ($p = 0.30$) showed a significant relationship with positive hepatitis C antibody [5].

Between 2004 and 2010, 530 adult patients were enrolled in a retrospective study of primary viral infections with herpes simplex virus (HSV-1), varicella-zoster virus (VZV), Epstein-Barr virus (EBV), and hepatitis (HAV / HBV / HCV analysis was finalized where 126 (25.1 %) had viral infection after liver transplantation [7].

CONCLUSION

According to the results, it can be said that viral macros (HIV Ab, HCV Ab, HBS Ag) are more frequently screened in immunocompromised patients and this is more frequent because of the higher prevalence of the disease. Hepatitis B, Hepatitis C, and HIV are common in immunocompromised patients and may also be due to routine testing in dialysis and transplant units. Despite the high prevalence of tuberculosis in patients with immunodeficiency, PPD test is of low frequency. Therefore, PPD Test should be considered as an important screening test in immunocompromised patients. Implementation of VDRL in immunocompromised patients is of low

frequency; due to its low prevalence of syphilis, its low frequency is justified. The frequency of VZV Ab in patients with immunodeficiency is zero; If tested negative, and if possible, get the chickenpox vaccine. Significance of the frequency of these tests according to the hospital admission ward indicates that type of ward is an important factor in performing or not performing the desired tests in patients. This may be due to the existence of specific protocols for routine testing. In the dialysis and transplantation section or in the patient's sensitivity to the above tests. The higher frequency of HIV Ab, HCV Ab, HBS Ag tests in men and its statistical significance indicates more attention to viral marker testing in men, given the higher prevalence of high risk behaviors and injecting addiction in males.

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