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THE ANALYSIS OF BIOCHEMICAL AND HEMATOLOGICAL PARAMETERS IN PSYCHIATRIC PATIENTS WITH A HISTORY OF IV DRUG ABUSE, ADDICTION AND HEPATITIS C IN AHVAZ CITY DURING 2012 - 2015

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ABSTRACT: Contaminated injection equipment have a pivotal role in the spread of HCV infection. IV drug users are one of the populations with a high risk of HCV infection. **Objectives:** our goal was to evaluate the role of a hazardous action (intravenous injection with contaminated equipment) in threat of public health. In this study, we collected data on 37 psychiatric patients with a history of IV drug abuse and addiction with HCV and compared to psychiatric patients with a history of IV drug abuse without HCV. Here was measured biochemical and hematological parameters and analyzed by SPSS. We found levels of AST and ALT significantly increased, but ALP and albumin none significantly decreased in patients ($p \leq 0.05$). Moreover, PT, aPTT, and ESR levels in patients were slightly higher than the control group. Also, a significant correlation between AST and ALT to serum creatinine in patients may indicate a relationship between kidney problems followed by hepatic damage. The mean value of FBS, Tg, and cholesterol levels was nearly similar in both groups. The serum level of calcium and phosphate in patients were significantly lower and higher than the control group, respectively ($p \leq 0.05$). There were a reduction and increment in serum level of free T3 and free T4 respectively, and the level of TSH in patients was nearly 3 times higher than the control group. Thus, primary hypothyroidism has seemed in the patients. Finally, we concluded the evaluation of IV drug abuser for the prognosis of HCV widespread is very important.

Keywords: HCV, IV drug abuse, Psychiatric patients, Serum level

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INTRODUCTION: According to a recent statistic, about 185 million people suffer from HCV in around worldwide, and the amount of mortality is 350,000 cases annually. This people usually are not aware of their infection and when they are aware that the treatment is very difficult [1].

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Intravenous injection can be risky behavior, particularly shared use or reuse of injection equipment that commonly observed in intravenous drug abusers [2, 3, 4].

One of the groups in exposure infection with HCV is intravenous drug abusers, and this is sure has become a major problem in society [5, 6]. However, the studies have been showed that 30-50% the prevalence of hepatitis C belongs to among intravenous drug users, so that an individual with a long history, may about 60% infect to HCV [5, 7, 8]. The risk of HCV spread through using injection equipment is 10 times more than the spread of HIV [9].

Statistics have been determined that about 20% of the Iranian population is addicted to drugs and is the prevalence of HCV nearly 1% in this country [10, 11, 12]. Probably the increment of addiction in Iran is inevitable due to a neighbor to Afghanistan as one of the main sources of drugs [13].

This study was performed according to our previous studies about mental disorders and the effect of different compounds on serum parameters in these diseases [14, 15]. Because HCV infection is often without symptoms and usually transmits by using common syringe and uncontrolled sexual behavior. Thus, the evaluation of HCV in high-risk people, especially in patients with a history of injection drug abuse to manage and control the disease is very valuable [16]. In this study, we examined biochemical and hematological parameters in the serum of psychiatric patients with a history of intravenous drug and HCV in the city of Ahvaz during 2012 - 2015.

METHODS:

The Evaluation of Biochemical and Hematological Parameters: In this case, due to the high specificity and limits of society, we used purposive sampling model. Thirty-seven psychiatric patients with a history of IV drug abuse and HCV participated in this study. Psychiatric patients with a history of IV drug abuse without HCV were selected as a control group. The average age of both groups was 35 years old. Sampling was performed with a sterile syringe and subsequently serum separated by centrifuge (1500 RPM, 5 min). Biochemical and hematological parameters were assessed according to instructions of a commercial kit (Pars Azmone, Tehran, Iran) with an automatic analyzer (Biotecnica BT-3000 plus Chemistry Analyzer, Italy). The measurements of thyroid biomarkers (free T3, free T4, and TSH) were performed by ELISA method. (Monobind, Inc. Costa Mesa, USA).

Statistical Analysis: All data are shown as mean ± SD. We used SPSS (version 16) software for analysis of obtained results. Independent Samples Test was performed for the compression of between groups. As a purpose, evaluation of correlation among parameters in the patient group, we used the Pearson correlation test. The significant difference was considered $p \leq 0.05$.

RESULTS: The results were determined that biomarkers of the liver (AST, ALT) significantly higher than the control group ($p \leq 0.05$). Also, the levels of ALP and albumin were none significantly lower than the control group ($p \leq 0.05$) **Table 1**.

As a purpose, the examination of inflammation associated with infection, we measured erythrocyte sedimentation ratio (ESR). We found that this parameter was slightly increased in the patients **Table 1**. It was also showed that measurement of prothrombin time (PT) and Activated Partial Thromboplastin Time (aPTT) as biomarkers extrinsic and intrinsic pathways of coagulation respectively in patients group was slightly raised in compared to control group **Table 1**. As depict **Table 1**, the mean value of serum creatinine level was nearly similar to the control group, and it also had a significant correlation with the level of AST and ALT($r = 0.613$, $p = 0.001$) and ($r = 0.658$ $p = 0.000$) respectively **Table 2**. We determined that BUN level was incremented in patients but as non-significant **Table 1**, thus probably there was the risk of kidney damage followed by liver enzymes increase an indicator of liver damage. Our study determined that only one patient had serum triglycerides above 200 mg/dl and also showed serum cholesterol above 200 mg/dl in three patients.

In this study, almost 90% patients have fasting blood sugar below 100 mg/dl, and only 2.7% of them have fasting blood glucose above 126 mg/dl in compared with the control group **Table 1**. It was not showed diabetes subsequently the elevation of liver enzymes. We found that the serum level of calcium inpatient group was significantly decreased in compared to the control group ($p \leq 0.05$). The mean value of phosphate serum was observed that this parameter at patient was significantly raised ($p \leq 0.05$) (3.98 and 4.23 mg/dl respectively). It was observed none significantly reduction in level of free T3, while free T4 inpatient group was increased but as non-significant **Table 1** was also observed about 3 times increase in TSH level, because the mean value of thyroid stimulating hormone (TSH) in control and patient groups was 0.46 and 1.48 mIU/L respectively. Deadly stimulation of TSH in patients resulted from a feedback response to thyroid hormones and indicated primary hypothyroidism.

TABLE 1: THE EVALUATION OF DIFFERENT PARAMETERS IN CONTROL AND PATIENT GROUPS

Parameters	Group	
	Control	Patient
age	35.45 ± 8.45	35.32 ± 8.30
AST (IU/L)	21.15 ± 5.76	58.29 ± 32.84*
ALT (IU/L)	19.45 ± 6.40	76.45 ± 49.05*
ALP (IU/L)	220.81 ± 56.42	214.83 ± 77.00
Albumin (gr/dl)	4.85 ± 0.24	4.50 ± 0.81
ESR (mm/hr)	9.19 ± 6.24	10.83 ± 13.79
PT (sec)	13.00 ± 0.25	13.09 ± 0.68
aPTT (sec)	34.80 ± 2.77	36.62 ± 3.78
BUN (mg/dl)	11.54 ± 2.57	12.35 ± 3.48
Creatinine (mg/dl)	0.79 ± 71.02	0.79 ± 69.74
Calcium (mg/dl)	9.62 ± 0.62	9.20 ± 0.59*
Phosphate (mg/dl)	3.98 ± 0.48	4.23 ± 0.43*
FBS (mg/dl)	86.13 ± 16.24	85.89 ± 16.00
Triglyceride (mg/dl)	97.10 ± 62.73	113.71 ± 71.25
Cholesterol (mg/dl)	143.86 ± 34.23	156.09 ± 45.83
T4 (µg/l)	6.96 ± 1.61	7.60 ± 0.76
T3 (ng/l)	1.24 ± 12.03	1.09 ± 0.31
TSH (mIU/L)	0.46 ± 8.45	1.48 ± 8.30*

The results depicted as mean ± SD and analyzed to Independent Samples Test using SPSS version 16.
* show a significant difference to the control group ($p \leq 0.05$).

TABLE 2: PEARSON CORRELATION TEST AMONG DIFFERENT PARAMETERS

Correlations	Pearson Correlation	P value
ALT, AST	0.711	0.000
ALT, ALP	0.753	0.012
AST, CR	0.613	0.001
ALT, CR	0.658	0.000

$p \leq 0.05$ was set as significant different between parameters

DISCUSSION: Our study investigated the evaluation of the relation between intravenous drug abuse and prevalence of HCV through measurement of biochemical and hematological parameters in psychiatric patients with a history of IV drug abuse and hepatitis C. It has been reported that about 60-85% patients with HCV would be infected to chronic infection.

Since most patients during chronic infection are asymptomatic or have nonspecific symptoms, thus prognosis is very important [17]. Erythrocyte sedimentation rate (ESR) is one of the biomarkers of infection and has been found that increases under conditions such as infection and inflammation [18, 19]. It has well been known that the levels of serum transaminase such as AST, ALT are valuable or assessing liver disease because they increment indicates liver damage [20]. Also, it was demonstrated that chronic hepatitis leads to the reduction of serum albumin and can also occur increment more than three second PT in viral hepatitis [20]. Significant reduction of proteins production and coagulation factors occur only in the end stages of liver damage and cirrhosis [21, 22]. Here, was observed a significant increase in serum AST and ALT concentration of patients compared to the control group ($p \leq 0.05$).

However, none significant reduction of albumin and ALP and slight increment of PT, aPTT, and ESR was showed that there was no damage the end stage. In previous studies, were confirmed that increase of serum creatinine and plasma cryoglobulin following treatment with interferon, indicate renal complications [23]. Our study showed that due to the significant correlation between serum creatinine to AST and ALT, there was the risk of kidney injury followed by liver damage.

Also, we determined significant reduction and increase in calcium and phosphate in the patient group respectively. Was also observed the prevalence of type 2 diabetes mellitus in liver disease for instant non alcoholic fatty liver, cirrhosis and viral hepatitis [24].

Mehta et al., 2001 showed that the prevalence of diabetes would increase approximately four times in people with HCV [25]. The study of Quershi and colleagues 2002 confirmed that about 19.4% of people with HCV in chronic status infected to diabetes. While the prevalence of diabetes is about 5.6% in patients without hepatic disorder [26]. Here was observed that there was no relationship between the liver injury to fasting blood sugar, cholesterol, and triglyceride levels.

The liver disorder, spatially acute hepatitis associated with reduction free T3 and free T4 [27]. It has well been confirmed the high prevalence of thyroid disorders among patients HCV, who received interferon, but it is controversial in patients that untreated with interferon.

Moreover, there is also a significant association between hypothyroidism and liver disease in patients with HCV [23]. We well demonstrated that the level of free T3 and free T4 in patients none significantly decreased and increased in compared to the control group, respectively ($p \leq 0.05$). While the serum TSH of patients significantly higher than the control group ($p \leq 0.05$) (about three times),

probably due to feedback response. Usually, occur autoimmune disorders after HCV for example; there is a possibility of hypothyroidism caused by thyroid autoimmunity by TAB and TPO autoantibody [28, 29].

CONCLUSION: In the end, we concluded that the use of contaminated injection equipment have a pivotal role in the spread of HCV and the evaluation of intravenous drug users as a high-risk group, to prevent the spread of infection in the community is very important.

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