ORIGINAL ARTICLE:
FREQUENCY OF DEPRESSION IN PATIENTS OF CHRONIC HEPATITIS C BEFORE STARTING TREATMENT
Muhammad Owais Fazal\textsuperscript{1}, Ghulam Abbas Tahir\textsuperscript{2}, Ahmed Bilal\textsuperscript{3}, Yasir Yaqoob\textsuperscript{4}, Kamran Ahmed\textsuperscript{5}, Ayesha Izzat\textsuperscript{6}

\textsuperscript{1-5}Faisalabad Medical University, Punjab, Pakistan.
\textsuperscript{6}Private clinic

CORRESPONDING AUTHOR: DR. MUHAMMAD OWAIS FAZAL E-mail: owais.fazal@pmc.edu.pk
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Abstract:

**Introduction:** Pre-existing psychiatric illnesses, such as mood and psychotic disorders, are 3–4 times more common and frequently undetected in HCV patients. This could be brought on by a diminished desire to use or access mental and primary health care services, actual or imagined stigma against HCV patients, or denial of their psychiatric symptoms. Comorbid depression can impact the outcome because it is linked to decreased HCV therapy adherence.

**Objectives:** To quantify the prevalence of depression among Hepatitis C patients not receiving treatment.

**Study Design:** This was a cross-sectional study.

**Setting:** Medical Department, Faisalabad Medical University and affiliated Allied Hospital, Faisalabad.

**Study duration:** 30\textsuperscript{th} December 2021 to 29\textsuperscript{th} June 2022.

**Methods:** A total of 310 patients having Hepatitis C infection, with an age range of 20 years to 60 years, were included, while the patients suffering from an additional underlying chronic medical disease like CKD, COPD, and diabetes, which can cause depression, were excluded. Demographic data, including age, gender, residence (rural or urban), education of patient (Primary, middle or higher education), marital status (single, married or separated), income of patient and duration of Hepatitis C infection were recorded. The researcher interviewed the selected patients by using Beck Depression Inventory.

**Results:** The study's age ranged from 20 to 60 years, with a mean age of 41.75 + 8.62. Most 163 patients (52.58\%) were in the 20–40 age range. 166 (53.55\%) of the 310 patients were men, and 144 (46.45\%) were women, for a male-to-female ratio of 1.2:1. In our study,
the frequency of depression in patients with Hepatitis C infection not receiving any treatment was found in 187 (60.32%) patients.

**Conclusion:** The conclusion of the study is that the frequency of depression in patients suffering from Hepatitis C infection not receiving any treatment is very high.

**Keywords:** hepatitis C, depression, Beck Depression Inventory.

**INTRODUCTION:**

The Flaviviridae family includes the Hepatitis C virus. The genome of the HCV virion is a single-stranded positive RNA. (1) It has numerous subtypes and six genotypes. Worldwide, 175 million HCV patients are or 3% of the world's population. (2) The highest incidence rate has been discovered in Egypt (15–20%) (3), while the United Kingdom has the lowest occurrence (0.01-0.1%). (3) Hepatitis C infection is present in 25% of people with hepatocellular carcinoma and 27% of people with cirrhosis, according to estimates. (4) Hepatitis C (HCV), which has a significant morbidity and mortality rate in Pakistan, is present in more than 10 million persons in the Pakistani population. (5)

Unsterilised sharp objects or needle stick injuries, blood and blood products transfusion, and tattooing are risk factors for spreading the hepatitis C virus. The possibilities of contribution from sexual and perinatal transmission have been estimated to be close to 5%. The other modes of spread are vertical transmission and sexual transmission. (6) Previous research revealed that the use of non-disposable needles for frequent medical parenteral injections was strongly linked to HCV seropositivity and that the majority of people who tested positive for the anti-HCV did not have a history of blood transfusions. Hepatitis C is one of the most widespread causes of chronic liver disease worldwide. (7) There are an estimated 71 million chronic hepatitis C infections worldwide. Those who get chronic hepatitis C infection run a 15%–20% chance of developing liver cirrhosis within 20 years. (8) According to the World Health Organisation, the Eastern Mediterranean and European regions, with 2.3% and 1.5% prevalence rates, respectively, are the most effective regions. (7) In Pakistan, which has a population of 190 million people, the hepatitis C virus has infected about 10 million people. (9)

Cirrhosis, hepatocellular carcinoma (HCC), and end-stage liver disease requiring liver transplantation are the most common outcomes of chronic hepatitis C. (10) A considerable global disease burden is a result of both rising mortality and morbidity from HCV-related advanced liver illnesses as well as patient-reported outcomes, such as quality of life or mental health status. (11)

Pre-existing psychiatric illnesses, such as mood and psychotic disorders, are 3–4 times more common and frequently go undetected in HCV patients. This could be brought on by a diminished desire to use or access mental and primary health care services, actual or imagined stigma against HCV patients, or denial of their psychiatric symptoms. As comorbid depression is linked to decreased adherence to HCV medication, it can impact prognosis. Between 20 and 50% of HCV patients report having depression, compared to
10% of the general population. \(^{(12)}\)

Before beginning treatment, 264 Hepatitis C patients were enrolled in a local study \(^{(13)}\) in Karachi. The subjects' average ages ranged from 17 to 71 and mean age was 39.82 ± 10.6121 years. 127 (48.1%) were men, and 223 (84.5%) were married. Hepatitis C was present for an average of 3.665 2.445 (0.1 to 12) years. 191 (72.3%) of the participants had depression.

The rationale of this study was to find the prevalence of depression in those patients with Hepatitis C who have not given any treatment yet (pretreatment prevalence in hepatitis C patients). Seeing the magnitude of the disease will help us find the burden of the disease and make policy for routine psychiatry evaluation in all patients of Hepatitis C infection before starting treatment. Without addressing depression, physicians cannot complete the treatment of chronic disease. Depression results in poor compliance and poor outcomes of medical treatment. Finding the frequency of depression and treating the undiagnosed depression will help improve the quality of life in patients suffering from Hepatitis C infection.

METHODS:

THE STUDY DESIGN:

It was a Descriptive, Cross-sectional study.

SETTING:

Medical Department, Faisalabad Medical University and affiliated Allied Hospital, Faisalabad.

OPERATIONAL DEFINITION.

**Hepatitis C infection:** Hepatitis C infection is defined as patient having positive ELISA report anti HCV antibodies.

**Depression:** Depression is operationally defined as symptoms meeting the Beck's Depression Inventory. (Performa will be filled for the selected sample in urdu language).

DURATION OF THE STUDY:

30\(^{th}\) December 2021 to 29\(^{th}\) June 2022.

SAMPLE SIZE:

It was calculated using the WHO sample size calculator,

\[ P = 72.3\%^{(3)} \]
Confidence Interval = 95%
Absolute precision required = 5%
Sample size = 310 patients

SAMPLE TECHNIQUE:

It was non-probability, consecutive sampling.

SAMPLE SELECTION:

a. Inclusion Criteria:

- Patients of both gender
- Patients aged 20 to 60 years.
- Patients were suffering from Hepatitis C infection as per the operational definition.

b. Exclusion Criteria:

- Already diagnosed cases of depression (Determined on medical record)
- Patients with underlying chronic diseases like CKD, COPD and diabetes can cause depression. (Determined by medical history).

DATA COLLECTION PROCEDURE:

After the approval from the hospital's ethical review committee, via letter No.F.4ERC/FMU/2020-21/, 310 patients with Hepatitis C infection were enrolled on OPD of the Medical Unit of Allied Hospital Faisalabad. Patients were enrolled after matching the inclusion and exclusion criteria. Written informed consent was taken from patients or guardians. Demographic data, including age, gender, residence (rural or urban), education of patient (Primary, middle, or higher education), marital status (single, married or separated), income of patient and duration of Hepatitis C infection were recorded. The researcher interviewed the selected patients by using the Beck Depression Inventory\(^{(4)}\).

All the pieces of information were collected on specially designed proforma. Patients with depression were treated as per hospital protocols.

DATA ANALYSIS PROCEDURE:

All the data was entered in SPSS V-23. The mean and standard deviation were calculated for all quantitative variables like age, duration of disease and Beck Depression Inventory score. Frequency and percentage were calculated for all qualitative variables like gender, income status, educational level, residence status and depression.

Effect modifiers like age, gender, duration of disease, educational status, residence status, income and marital status were controlled by stratification. Post-stratification chi-square test was applied, and a P-value ≤0.05 was taken as significant.
RESULTS:

The age range in this study was from 20 to 60 years, with a mean age of 41.75 ± 8.62 years. Most of the patients, 163 (52.58%), were between 20 to 40 years of age, as shown in Table I.

Of 310 patients, 166 (53.55%) were male, and 144 (46.45%) were females, with a male-to-female ratio of 1.2:1, as shown in Figure I. Our study's mean disease duration was 5.84 ± 2.16 years, as shown in Table I. The distribution of patients according to place of living is shown in Table I. The distribution of patients according to education, income & marital status is shown in Table II.

In our study, the frequency of depression in patients with Hepatitis C infection not receiving any treatment was found in 187 (60.32%) patients (Figure II).

Stratification of depression concerning age groups and gender & duration of illness is shown in Table III. Tables IV shows the stratification of depression concerning the income, education & marital status. The stratification of depression for residence is shown in Table V.
Table 1: Distribution of patients according to age, duration of disease, place of living, education, income, and marital status. (N=310 each group)

<table>
<thead>
<tr>
<th>Age in year</th>
<th>No. of patients</th>
<th>%</th>
<th>Duration of disease (years)</th>
<th>No. of patients</th>
<th>%</th>
<th>Place of living</th>
<th>No. of patients</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>20-40</td>
<td>163</td>
<td>52.58</td>
<td>&gt;5</td>
<td>177</td>
<td>57.10</td>
<td>Rural</td>
<td>110</td>
<td>35.48</td>
</tr>
<tr>
<td>41-60</td>
<td>147</td>
<td>47.42</td>
<td>&lt;5</td>
<td>133</td>
<td>42.90</td>
<td>urban</td>
<td>200</td>
<td>64.52</td>
</tr>
<tr>
<td>Mean ± SD = 41.75 ± 8.62 years</td>
<td>Mean ± SD = 5.84 ± 2.16 years</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table II: Distribution of patients according, education, income, and marital status, (N=310 each group)

<table>
<thead>
<tr>
<th>Education</th>
<th>No. of patients</th>
<th>%</th>
<th>Income status</th>
<th>No. of patients</th>
<th>%</th>
<th>Marital status</th>
<th>No. of patients</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Primary</td>
<td>50</td>
<td>61.13</td>
<td>Lower</td>
<td>98</td>
<td>31.61</td>
<td>Unmarried</td>
<td>66</td>
<td>21.29</td>
</tr>
<tr>
<td>Middle</td>
<td>128</td>
<td>41.29</td>
<td>Middle</td>
<td>138</td>
<td>44.52</td>
<td>Married</td>
<td>224</td>
<td>72.26</td>
</tr>
<tr>
<td>Higher</td>
<td>132</td>
<td>42.58</td>
<td>Affording</td>
<td>74</td>
<td>23.87</td>
<td>Separated</td>
<td>20</td>
<td>6.45</td>
</tr>
</tbody>
</table>

Table III: Stratification of depression concerning age group, gender, duration off illness.

<table>
<thead>
<tr>
<th>Age</th>
<th>Depression</th>
<th>Gender</th>
<th>Depression</th>
<th>Duration</th>
<th>Depression</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Yes</td>
<td>No</td>
<td>Yes</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>20-40</td>
<td>99 (60.4%)</td>
<td>65 (39.26%)</td>
<td>Male</td>
<td>112 (67.47%)</td>
<td>54 (32.53%)</td>
</tr>
<tr>
<td>41-60</td>
<td>89 (60.54%)</td>
<td>58 (39.46%)</td>
<td>Female</td>
<td>75 (52.08%)</td>
<td>69 (47.92%)</td>
</tr>
<tr>
<td>p-value</td>
<td>0.974</td>
<td>p-value</td>
<td>0.006</td>
<td>p-value</td>
<td>0.112</td>
</tr>
</tbody>
</table>
Table IV: Stratification of depression concerning income, education, marital status.

<table>
<thead>
<tr>
<th>Income</th>
<th>Depression</th>
<th>Education</th>
<th>Depression</th>
<th>Marital status</th>
<th>Depression</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Yes</td>
<td>No</td>
<td>Yes</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>Lower</td>
<td>62 (63.27%)</td>
<td>39 (35.45%)</td>
<td>32 (64.0%)</td>
<td>18 (36.0%)</td>
<td>Unmarried</td>
</tr>
<tr>
<td>Middle</td>
<td>82 (559.42%)</td>
<td>84 (42.0%)</td>
<td>75 (58.59%)</td>
<td>53 (41.41%)</td>
<td>Married</td>
</tr>
<tr>
<td>Affording</td>
<td>43 (58.11%)</td>
<td>31 (41.89%)</td>
<td>80 (60.61%)</td>
<td>52 (39.39%)</td>
<td>Separated</td>
</tr>
<tr>
<td>p-value</td>
<td>0.758</td>
<td></td>
<td>p-value</td>
<td>0.799</td>
<td>p-value</td>
</tr>
</tbody>
</table>
Figure I: Distribution of patients according to gender (n=310).

Figure II: Frequency of depression in patients of Hepatitis C infection not receiving any treatment (n=310).
Table V: Stratification of depression concerning residence.

<table>
<thead>
<tr>
<th>Residence</th>
<th>Depression</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>Rural</td>
<td>71 (64.55%)</td>
<td>39 (35.45%)</td>
</tr>
<tr>
<td>Urban</td>
<td>116 (58.0%)</td>
<td>84 (42.0%)</td>
</tr>
</tbody>
</table>

DISCUSSION:

A frequent mental disorder and the main contributor to disability globally is depression \(^{(5)}\). Major depression has been linked to long-term hepatitis C (HCV) exposure and prior interferon-alpha antiviral therapy. \(^{(6,7)}\) In over 80% of instances, HCV infection results in chronic hepatitis C (CHC), and in one in five people within 20 to 50 years of the initial condition, liver cirrhosis; of these, 5 to 10% will develop hepatocellular carcinoma or decompensated liver disease. \(^{(5)}\) It is now known that chronic hepatitis C (CHC) is a systemic illness with a wide range of extrahepatic symptoms, such as anhedonia, lethargy, irritability, anxiety, sleeplessness, and heightened pain sensitivity. \(^{(9)}\) There is proof that HCV directly invades the brain \(^{(10)}\) and that the immune system has been chronically stimulated. \(^{(11)}\) These elements may work in conjunction with several neuronal pathways, neurotransmission, and neurotrophic mechanisms to cause neuropsychiatric symptoms in CHC. \(^{(6,7)}\)

To ascertain the prevalence of depression in Hepatitis C patients who are not receiving therapy, we did this study. The study's participants ranged in age from 20 to 60, with a mean age of 41.75 + 8.62 years. 163 (52.58%) of the patients, or the majority, were in the 20–40 age range. 166 (53.55%) of the 310 patients were men, and 144 (46.45%) were women, for a male-to-female ratio of 1.2:1. In our study, 187 patients (60.32%) with hepatitis C infection who were not receiving therapy frequently experienced depression. Before beginning treatment, 264 Hepatitis C patients from Karachi were included in a local study \(^{(3)}\). The subjects' average ages ranged from 17 to 71 and were 39.82 10.6121 years. 127 (48.1%) were men, and 223 (84.5%) were married. Hepatitis C was present for an average of 3.665 2.445 (0.1 to 12) years. 191 (72.3%) of the participants had depression.

In a substantial American cohort (n=4,781) with prior history of intravenous drug use (IVDU) in 51.4%, the prevalence of depression in chronic HCV-infected patients was reported to be 29.7%, which is higher than the 9% prevalence in the general population using the personal health questionnaire (PHQ-8) with a cutoff score of 10,\(^{(14)}\) which was consistent with the findings of the other studies. \(^{(8,9)}\) In contrast to chronic hepatitis B, chronic hepatitis C (CHC) was independently related to depression, according to data from the National Health and Nutrition Examination Survey (2005–2010, n=10,231). Major
depressive disorder occurred in 11.4% of HCV patients, with a 54.6% prevalence of depression, according to the Patient Health Questionnaire (PHQ-9). Among Australian CHC patients (n=395), the Hospital Anxiety and Depression Scale (HADS-D 8) depression prevalence was 27%, which is 2.4 times higher than community norms and linked with single status. In a nationwide survey carried out in Japan, 7.1% of patients reported having depression. Even though a substantial prevalence (51.6%) of depression by Beck depression inventory (BDI-II) was identified in 67 Chinese IVDUs, there are data on the majority of depression in CHC patients from Asian countries.

One hundred thirty-five individuals with chronic hepatitis C and 76 patients with chronic hepatitis B were assessed for major depressive disorder by Mauro G. Carta et al. When compared to chronic hepatitis B and the control group, they found that major depressive disorder was more common in people with chronic hepatitis C. Ultimately, interferon therapy did not affect the association between chronic hepatitis C and major depressive disorder (based on international diagnostic criteria). This could be due to fewer therapeutic alternatives, increased social anxiety, and an unremarkable outlook for chronic hepatitis C, which together increase the prevalence of depression.

There is a considerable range in the commonness of depression among Hepatitis C patients. Compared to the general population (6–10%), it ranges from roughly 24–70%. The wide variety of prevalence estimates made by various studies may be due to the complexity of the disease itself, the racial and population makeup of the study participants, and other factors related to depression and anxiety. According to Kenny-Walsh, 376 Irish women who had contracted iatrogenic hepatitis C had a 16% prevalence of sad mood documented in their medical records. In 500 patients evaluated at a tertiary referral center, a majority of 24% were diagnosed with depression, according to Lee et al. Using a standardized psychiatric interview, Dwight et al. discovered a 28% frequency in 50 individuals.

Uncertain factors may be at play in the increased rate of depression among hepatitis C patients. However, it has been hypothesized that several factors may be at play, including disease characteristics, such as changes in brain metabolites as shown by dynamic brain imaging and unpredictable, inconsistent, and complex disease progression. The reasons for depression in this population have also lately been linked to affective variables, stigma perception, and the involvement of platelet 5-HT. As seen in numerous studies in Pakistan, where the prevalence of depression is twice as high in female patients compared to male patients, gender differences also play a crucial role. However, this study's HCV patients did not exhibit this gender disparity.

CONCLUSION:

This study concluded that the frequency of depression in patients with Hepatitis C infection not receiving any treatment is very high. So, we recommend that in every patient with hepatitis C, depression should be considered, and its early recognition and management should be done to reduce the community's morbidity.

Conflict of interest
It is educational research, and there is no intervention of any kind, and researchers have no conflict of interest.

References:


