

Investigating the Health-related Quality of Life in Hepatitis C Patients with Liver Cirrhosis Using Oral Antivirals, Before and after the Treatment

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Abstract

Objectives: Liver Cirrhosis is a debilitating chronic complication of many liver diseases including hepatitis C virus infection. Oral treatment of anti-viral infection can have effect alleviation this complication. The present study was conducted to measure the effect of oral antiviral treatment on the health-related quality of life in the patients with chronic hepatitis C. **Methods:** A before and after the treatment intervention setting clinical trial was setup. Patients included cases of clinically hepatitis C with liver cirrhosis. Oral antiviral drugs were administrated as intervention. The quality of life was measured using Chronic liver disease questionnaire (CLDQ) before treatment and after treatment. Patient demographics, treatment information, and HRQoL scores were collected. **Results:** A total of 65 patients with hepatitis C and liver cirrhosis were included in the study. The mean score of the patients' quality of life and all its dimensions, 12 weeks after treatment with oral antiviral drugs, was on average 23.59 points higher than before, and this difference was significant ($p < 0.001$). Significant improvements were observed in all dimensions of HRQoL, including emotions, worries, systemic symptoms, abdominal symptoms, activity, and fatigue ($p < 0.001$). No significant correlations were found between the mean difference in HRQoL scores and age or disease duration ($p > 0.05$). **Conclusions:** The present study shows that the use of oral antiviral drugs can improve the health-related quality of life. Health care providers can use the results of the study to plan regarding the treatment and care measures which increase the quality of life in hepatitis C patients.

Keywords: Quality of life- hepatitis C virus- liver cirrhosis- oral antiviral therapy

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Introduction

Hepatitis C is a major public health problem and the most common cause of death due to liver diseases in the world [1]. This disease has affected 3% of the world's

population, and 1.7 million people are infected with this virus every year [2]. Its prevalence in Iran has an upward trend, too [3]. Therefore, in order to prevent it from

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spreading, it must be properly managed [4].

Hepatitis C diagnosis is associated with anxiety, despair, depression, job instability, the collapse of married life, and being rejected by the society [5,6]. The liver damage caused by hepatitis C may be minor or progress to the stage of liver cirrhosis [7]. Therefore, hepatitis C treatment is done with the aim of improving the patients' quality of life [8].

There are many drugs in the world for the treatment of hepatitis C [9]. Alpha interferon along with ribavirin, with a recovery rate of 50 to 80%, was the first treatment approach for hepatitis C, which is still used today [4]. Treatment with interferon will aggravate neuropsychiatric symptoms such as depression, fatigue, and fever, which is associated with a decrease in the quality of life, and is considered as the main cause of discontinuation of treatment [10, 11]. With the improvements in hepatitis C treatment, diagnostic methods, and the development of new treatments, care provision for the chronic disease caused by hepatitis C has improved [12]. New drugs with greater effectiveness, fewer side effects, lower prices, easier access, and no need for injection are mainly chosen for therapeutic purposes [4, 13]. Currently, in Iran, oral antiviral drugs are mainly prescribed for the treatment of hepatitis C [9]. These drugs are associated with increased life span in the patients with hepatitis C and improved prognosis [14, 15].

Quality of life is a broad concept that includes health status, environmental, economic, social, political, cultural and spiritual characteristics [16]. Health-related quality of life is related to health and illness [17] and indicates physical, mental, and social health, which is influenced by one's feeling towards health status, expectations, and beliefs regarding disease [18].

the studies conducted regarding the effect of oral antiviral drugs on the patients' quality of life are limited [19]. On the other hand, the successive introduction of new drugs for treatment and the uncertainty about the effects of these drugs on the patients' quality of life lead to the lack of a clear image of the effects of these drugs on the patients' quality of life [20]. Assessing the quality of life is considered as a standard for reporting the patient's experiences of the disease, the treatment, and the main goal of care [21]. However, the quality of life in the patients with chronic liver disease has not been studied as well as other chronic diseases, and nurses do not pay special attention to the factors affecting the quality of life in these patients [22]. Examining the quality of life and health status is used in health policy making and determining the cost-effectiveness of treatment methods [23].

Objectives

Based on the results of literature review, considering the effect of patients' quality of life on the treatment's rate of success [18] and the limited number of studies on health-related quality of life in hepatitis C patients undergoing treatment with new drugs, the present study was conducted with the aim of investigating the effect of oral antiviral drugs used in Iran on the health-related quality of life in the patients with chronic hepatitis C.

Materials and Methods

A single-group descriptive-analytical study was conducted with the aim of determining health-related quality of life in 2 years in hepatitis C patients with liver cirrhosis undergoing treatment with oral antiviral drugs both before and after the treatment at Tehran Hepatitis Center from. The patients who visited Tehran Hepatitis Center for the first time and underwent treatment with new drugs were included in the study. In this study, convenience sampling method was used.

After stating the goals and completing the informed consent form, health-related quality of life questionnaire was completed by the patient on the first visit (time zero); in case of the patient's disability, it was completed by the researcher. At that time, the patients were not undergoing treatment with oral antiviral drugs. Then the questionnaire was completed again 12 weeks after completing treatment with oral antiviral drugs, either in person. The data collection tools included a demographic information questionnaire created by the researcher with a validity confirmed by 10 nursing professors including 10 statements about age, gender, marital status, the number of children, work experience, educational level, hospitalization history, insurance status, income status, and the duration of the disease, in addition to the Chronic Liver Disease Questionnaire (CLDQ), including 29 statements on a 7-point Likert scale consisting of all the time, almost always, most of the time, sometimes, not very often, rarely, and never. To analyze the data, they were entered into SPSS software version 22 in the form of codes. Descriptive and analytical statistical tests such as standard deviation, mean, paired t, and Pearson were used to analyze the data.

Since the observance of ethical principles in conducting research is of great importance, they were respected in this study, too. These principals include obtaining informed consent, respecting the dignity and the rights of patients, the patients' right to choose whether to participate in the research or not, and the samples' right to withdraw at any stage, and the principles of confidentiality, precision, and scientific trustworthiness in recording the obtained information and statistics. Moreover, sampling permission was obtained from the Ethics Committee of Shahid Beheshti College of Nursing and Midwifery with the ethics code of IR.BMSU.REC.1397.390.

Results

A total of 65 patients with hepatitis C and liver cirrhosis were included in the study. Sixty percent of the patients were male. The mean age of the patients was 47.23 (± 8.68). More than half of the patients (51.7%) were married. Most of the patients (83.3%) were also undergoing treatment with Daclatasvir/sofosbuvir (Table 1).

The results of the paired t-test showed that 12 weeks after completing treatment with oral antiviral drugs, the mean score of the patients' quality of life was 23.59 points higher than before on average, and this difference

Table 1. The Patients' demographic Characteristics

Variable	Number (Percentage)
Gender	
Female	23 (40)
Male	36 (60)
Marital status	
Single	16 (26/7)
Married	31 (51/7)
Divorced	11 (18/3)
Widow (er)	1 (1/7)
Education status	
Illiterate	7 (11/7)
Elementary school	12 (20)
Secondary school	13 (21/7)
High school	16 (26/7)
Above high school	12 (20)
History of hospitalization	
No history of hospitalization	41 (68/3)
Once	11 (18/3)
Twice	5 (8/3)
Three times	1 (1/7)
Four or more times	1 (1/7)
Type of treatment	
Daclatasvir/sofosbuvir	50 (83/3)
Sobopasvir	2 (3/3)
Ledibiox	7 (13/4)
Disease	
No disease history	28 (47/5)
Kidney diseases	9 (15/3)
Heart diseases	7 (11/9)
Lung diseases	5 (8/5)
Diabetes	4 (6/7)
Nervous system diseases	4 (6/7)
Joint disorder	2 (3/4)

is significant ($p < 0.001$). Moreover, the patients showed a significant difference in all the dimensions of quality of life both before and after the treatment ($p < 0.001$) (Table 2).

The results of Pearson's test showed that the mean difference in the quality-of-life score before and after the treatment had no significant correlation with any of the variables of age and disease duration ($p > 0.05$). Due to the fact that the type of treatment in most patients (50 patients) was Daclatasvir/sofosbuvir and only 9 patients used other treatments, it was not possible to perform tests for this variable (Table 3).

Discussion

The present study was conducted with the aim of investigating the health-related quality of life in the hepatitis C patients with liver cirrhosis undergoing

treatment with oral antiviral drugs both before and after the treatment. The results of the study showed that the health-related quality of life in hepatitis C patients increased significantly after the 12-week treatment, which is in line with the results of the studies of Fagundes et al. (2020) [19] and Ohlendorf et al. (2021) [13]. In the study of Hussan et al. (2021) [4], which examined the health-related quality of life in the hepatitis C patients receiving different therapeutic diets, the results showed that the patients receiving oral antiviral drugs have better scores of quality of life in comparison with the patients treated with interferon [4], which is in line with the present study. The quality of life is affected by the management and the complications related to the disease, and the severity and the progressive nature of liver cirrhosis will have a significant negative impact on the quality of life [24]. That's why in the present study, most of the patients had a low quality of life before starting the treatment.

The use of new treatment approaches is effective in increasing the patients' quality of life through reducing complications, increasing performance, and shortening the treatment period [25]. In the study of Goñi Esarte et al. (2018) [17] as well as in the present study, the 12-week use of oral antiviral drugs was associated with shortening the treatment period, reducing side effects, and increasing the patients' quality of life, which can be caused by the initial feeling of euphoria because of achieving treatment [17].

In the current study, the health-related quality of life dimensions, including fatigue, systemic symptoms, abdominal symptoms, activity, emotional dimension, and worries had low scores before beginning the treatment, and within 12 weeks after the treatment, there were significant differences in the scores of the quality of life dimensions. The consumption of oral antiviral drugs for 12 weeks had the greatest impact, respectively, on the dimensions of emotions, worries, systemic symptoms, abdominal symptoms, activity, and fatigue, which will be discussed and analyzed regarding each dimension.

In the present study, before beginning the treatment, the patients had low scores in the emotional dimension of the quality of life, and during the 12 weeks of treatment with oral antiviral drugs, the emotional dimension score increased significantly. This can be due to the fact that at the time of being diagnosed with hepatitis C, the patients worry about transmitting the infection to their family and relatives, which is the most common factor decreasing the quality of life in the emotional dimension [13]. On the other hand, the disease symptoms affect the patients' quality of life in the emotional dimension, too. Through taking oral antiviral drugs, becoming aware of the treatment process, and the reduction of disease symptoms, the score of the quality of life increases in this dimension [2].

Depression, anxiety, worries, and fatigue are the most common extrahepatic complications of hepatitis C. On the other hand, these symptoms may be a psychological reaction to the decrease in the quality of life due to the chronic disease [2]. In the present study, the use of oral antiviral drugs for 12 weeks has been effective in reducing the patients' anxiety, and their level of anxiety

Table 2. The Comparison of Research Units According to the Quality of Life Score before and after the Treatment

Dimensions	Minimum-Maximum	Mean before	Standard deviation before	Mean after	Standard deviation after	P Value paired t test
Tiredness	3-21	8/47	2/09	8/52	2/08	0/000
Abdominal symptoms	5-35	4/55	1/03	6/49	1/51	0/000
Systemic symptoms	5-35	8/61	1/39	13/54	2/07	0/000
Activity	3-21	4/45	1/17	6/06	1/60	0/000
Emotional dimension	8-56	11/8	1/77	20/40	2/77	0/000
Worries	5-35	9/42	1/9	14/88	2/8	0/000
Overall score	29-203	46/32	4/7	69/91	5/9	0/000

Table 3. The Correlation between the Difference in the Score of Quality of Life before and after the Treatment, with Demographic Characteristics

Variable	Number	Differences in the mean score of quality of life before and after the treatment	Standard deviation	Test	Pvl	
Gender	Male	36	22/52	6/62	Independent t	0/171
	Female	23	25/26	8/47		
Disease genotype	1	39	22/76	6/80	Independent t	0/239
	3	20	25/20	8/53		
Comorbidity	Has	18	24/77	6/39	Independent t	0/423
	Doesn't have	41	23/07	7/88		

has decreased as a result of taking the drug. In the study of Youssef et al. (2017) [26], it was observed that the level of worrying and anxiety in hepatitis C patients is high before beginning the antiviral treatment, which has a considerable negative effect on the quality of life; during the treatment, the patients' worries decrease [26], which is consistent with the present study [17].

The hepatitis C patients with liver cirrhosis suffer from systemic complications such as ascites, liver encephalopathy, joint pain, itchy skin, loss of appetite, and memory problems [22]. At the beginning of the diagnosis of the disease, the symptoms and the systemic complications of the disease are associated with anxiety and will reduce the quality of life [4]. In the present study, the patients had a low quality of life in the systemic dimension before the treatment. Fever, headaches, fatigue, and muscle pain are among the common side effects of hepatitis C treatment. Most of the side effects occur during interferon treatment. On the other hand, the patients taking oral antiviral drugs do not have to endure the stress caused by injections. Therefore, these drugs are more tolerable, and with the reduction of the systemic side effects caused by the treatment, the quality of life in this dimension increases, too [4]; it was also seen in the results of the present study. In the present study, the patients had a low level of the quality of life in the systemic dimension before starting the treatment, but within 12 weeks after taking oral antiviral drugs, the quality of life in this dimension increased. The reason for the low effect of oral antiviral drugs on the systemic dimension of health-related quality of life can be related to the fact that the reduction of the systemic symptoms caused by the disease takes time, and the treatment itself can also be associated with

extrahepatic systemic symptoms such as fatigue [4].

The patients infected with hepatitis C virus are affected by fatigue, depression, and anxiety, and this disrupts the health-related quality of life [17]. Hepatitis C can significantly compromise the health-related quality of life indexes that indicate the impact of the disease and the treatment on social roles, activities, and responsibilities [19]. In the present study, too, the score of the quality of life before the treatment was low in the dimensions of activity and fatigue. Routine activities and self-care are also indirectly related to the fatigue caused by hepatitis infection [17]. Fatigue is a common and debilitating complaint among the patients with hepatitis C, which is associated with a negative impact on the quality of life [19]. In the present study, the quality of life dimensions of activity and fatigue were associated with a slight improvement after the treatment, compared to other dimensions, which is in line with the study of Fagundes et al. (2020) [19], because in these patients, fatigue occurs, followed by a decrease in productivity and activity, which can be due to the disease or the complications caused by the treatment [19].

The impact of hepatitis C on the health-related quality of life varies from population to population depending on socioeconomic differences, culture, religion, and lifestyle [27]. In the current study, the mean age of the hepatitis C patients with liver cirrhosis was 47.23 years, most of them were male, married, and had a high school diploma. The results are similar to those of the studies of Huang et al. (2018) [27] and Abd ElHamied et al. (2020) [28]. Also, in the systematic study by Peng et al. (2019) [29], most of the patients with liver cirrhosis were in their 50s and male [29]. In the patients with hepatitis C

and liver cirrhosis, the quality of life is not affected by gender [2]. In the study of Hussen et al. (2021) [4], no significant difference was found regarding gender and the health-related quality of life, either [4]. Similar to the study of Kačavenda-Babovi et al. (2021) [2], in the present study, no significant correlation was found between the scores of the quality of life before and after the treatment and any of the two variables of gender and age, either, while some studies show that the score of the quality of life is lower in the women with hepatitis C compared to men [30]. This inconsistency in the results may be due to the small sample size and data collection in a limited geographical area.

Based on the results of the present study it seems that new antiviral drugs improve the treatment results, and it is expected to have positive effects on the quality of life (21).

Considering the decrease in the health-related quality of life in the hepatitis C patients with liver cirrhosis, a multidisciplinary approach and timely interventions are of great importance [29]. A combination of psychosocial aspects and treatment is an important factor that determines the quality of life. Therefore, the health-related quality of life is an important consequence to determine treatment and prognosis in these patients [22]. Since the ultimate goal in managing the patients with liver cirrhosis is not simply to increase life, but the main goal is to improve and maintain a relatively good quality of life [24], nurses should take measures to improve the quality of life in the patients with hepatitis C infection through teaching lifestyle changes, increasing knowledge, modifying behavior, reducing fatigue, and increasing the functional ability [28]. Despite the progress in the field of hepatitis C diagnosis, treatment, and care provision, the best way to eradicate the disease is to teach prevention methods and increase disease detection in the community, in which community health nurses can play an effective role [25].

Among the applications of this research, it can be pointed out that as nurses are aware of the quality of life in hepatitis C patients, they can play an effective role in increasing it through educating, increasing information, and improving the behavior of the patients. All health care providers should pay attention to the quality of life in the infected patients in addition to treating hepatitis C, and try to increase it. Such studies can be used as clinical guides in order to get information about the patients' quality of life.

Study limitation

The characteristics and the psychological states of the patients while completing the questionnaire can affect the results of the research, which is one of the limitations of this study.

In conclusion, the significant increase in the prevalence of hepatitis C at the global level makes it vital to evaluate the patients' quality of life. The present study shows that the use of oral antiviral drugs for 12 weeks can be associated with improvements in all the dimensions of health-related quality of life. The results of the present study can help nurses, physicians, and psychologists to have an insight into the quality of life in hepatitis C patients, pay attention to their quality of life in their

treatment and care provision for them, and have an active role in planning measures to improve their quality of life. Moreover, counseling and nursing training in the field of primary and secondary prevention should be done, with the aim of reducing the burden of this chronic health condition and increasing the patients' quality of life.

Key points of this Study

1. Health-Related Quality of Life Improvement: The study investigated the health-related quality of life in hepatitis C patients with liver cirrhosis who underwent treatment with oral antiviral drugs. It was found that after a 12-week treatment, the patients' quality of life improved significantly in all dimensions, including emotional state, worries, systemic symptoms, abdominal symptoms, activity, and fatigue.

2. Impact of Oral Antiviral Drugs: The use of oral antiviral drugs for 12 weeks was associated with positive outcomes, such as a reduction in treatment-related complications and an increase in the patients' quality of life. The drugs were better tolerated compared to previous treatments involving interferon, leading to improved overall well-being in the patients.

3. Demographic Factors and Quality of Life: The study revealed that there was no significant correlation between the patients' age and gender and their quality of life scores. Most of the patients were male, married, and had a high school diploma, but these factors did not seem to affect the patients' quality of life before or after treatment significantly.

Overall, the study highlights the importance of considering health-related quality of life in hepatitis C patients with liver cirrhosis and emphasizes the positive impact of oral antiviral drugs on improving patients' well-being. The findings can be valuable for healthcare providers, including nurses, physicians, and psychologists, in planning measures to enhance the patients' quality of life during treatment and care provision.

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Contributor ships

Author (Sahar Haghghat, Atefe Salimi Akinabadi, Mitra Zandi, Aram Halimi, Homayoon Bana Derakhshan) Study conception/design; data analysis; drafting of manuscript; supervision; statistical expertise.

Author (Nabeel Al-Yateem, Aaliyah Momani, Alizera Mosavi Jarrahi, Jacqueline Maria Dias) drafting of manuscript, data analysis, critical revisions for important intellectual content.

Availability of data and material

The datasets used and/or analyzed during the current study are available from the corresponding author on reasonable request.

Conflicts of interest

The author(s) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

Ethical Statement

Sampling permission was obtained from the Ethics Committee of Shahid Beheshti College of Nursing and Midwifery with the ethics code of IR.BMSU.REC.1397.390.

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