PHARMACOECONOMIC CONSIDERATIONS AND QUALITY OF LIFE ASSESSMENT IN HEPATITIS C PATIENTS

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Abstract

Background: Gradual liver damage occurs due to hepatitis C virus (HCV) that may result in liver fibrosis and even cancer. Pakistan is a developing country with the second highest prevalence 4.5-8% of hepatitis C. The main purpose of this study was to estimate the quality of life of people affected with hepatitis, to create general awareness about the disease and to determine pharmacoeconomic considerations of hepatitis C treatment.

Methods: It was a cross-sectional study conducted in village Wali Pur Bura of District Nankana sahib, Punjab, Pakistan. Sample size determined by Daniels equation was 100, both male and female participants were included in this study. The data was collected to assess the health status data of study population through validated questionnaire and a Urdu version of tool EuroQol 5D-5L, comprising of five (5) questions covering the various aspects of health. Data were analyzed through SPSS version 16. Paired sample statistics for comparing two attributes of the study and frequencies were calculated.

Results: In current study, majority (70 %) of patients were belong to the lower class and only 39% patients were aware of Punjab Government's participation in hepatitis free treatment plan. 60% patients showed marked reduction in quality of life and the reason behind was painful interferon therapy. Poor quality of life is observed due to the extra hepatic symptoms of HCV including depression. According to the health scale of 60 participants out of 100 was having below Average health status, 21 participants possessed Average Health while 19 participants had Excellent Health.

Conclusion: Hence, concluded that due to hepatitis C, health as well as socioeconomic and family life is badly affected. Majority of the participants were having poor quality of life. Costly treatment is beyond the reach of majority of rural population that increases the incidence of depression among patients and their families.

Keywords: Hepatitis C, quality of life, socioeconomic, rural areas.

Introduction

Gradual liver damage occurs due to hepatitis C, which results in cancer of liver cells and liver fibrosis. Globally more than 185 million people have been infected with HCV, out of them 3,50,000 die every year (1). Globally, Pakistan is at the second number who has high prevalence of hepatitis C (4.5% to 8.0) (2). HCV is a hepatotropic RNA virus and belongs to the flaviviridae family (3). HCV infected person is the main carrier for the transfer of hepatitis C. In present, most widely spread blood borne disease is hepatitis C. It is calculated that the cases of HCV will increase in the future and it will be a main cause of hepatocellular carcinoma (4). HCV patients have multiple signs and symptoms of disease, which ranges from the lack of clinical manifestation to the presence of entire body symptoms, which includes loss of appetite and tiredness. At advance stage, abnormal accumulation of fluid in the abdominal cavity occurs other complications include hepatic encephalopathy and jaundice (5). It is not only a hepatic disorder but also a psychosocial disease (6). 20%-40% patients with chronic hepatitis C develop liver fibrosis or hepatocellular carcinoma that leads towards liver failure and ultimately death. The chances of liver cancer in patients with CHC reaches 1%-4% each year (7). Test for hepatitis C diagnosis divided into two categories: serological assays that determine anti-HCV antibodies and molecular assays that discover, represent or quantify HCV RNA genomes. For screening of anti-HCV serological assays are used like, the Recombinant Immunoblot Assay (RIBA) and the enzyme immunoassay (EIA) (8).

Quality of life of Hepatitis C patients

According to different studies, all patients affected with Hepatitis C, don't have compromised quality of life and other chronic symptoms associated with the disease. (9). While on contrast some other studies indicated have a reduced HRQOL in HCV patients (10). Even patients who did not show any signs of cirrhosis, confronted different psychological and physical problems (10). Extra hepatic symptoms of HCV infection including anxiety, myalgia, gastrointestinal disturbances, depression and fatigue may exacerbate the quality of life (11).

Gender difference is important factors in HCV infection as number of studies shows that women have more worsen quality of life than men. Reduced quality of life is due to the somatic side effects associated with interferon-ribavirin therapy. Relapse HCV is also associated with poor quality of life (12). The high cost of treatment also disturbs the patient psychologically (11). The poor quality of life is also due to non-viral factors, such as psychiatric disturbance associated with previous IV drug use (10). Patient's negative perception about his or her disease is also alter the quality of life. They believe that their disease is responsible for disconnecting them from social activities that leads them towards social loneliness. HCV can cross BBB and cause mood changes, depression is also one of the major factor which reduces the patient's quality of life (11).

Pharmacoeconomic considerations of Hepatitis C

A large number of individuals having HCV infection are unaware about their disease (13). Benefit from the treatment can be identified by screening. Mass screening for HCV infection has significant economic concerns which are linked with different additional diagnostic tests such as liver biopsies and also with the cost of screening test using different assays (14).

HCV executes a high economic burden globally. In 2012, the healthcare cost of HCV infection was 6.5 billion dollars and it is estimated that the cost will be reach at 9.1 billion dollars by the year 2024 (15). In developed countries treatment of Hepatitis of C with boceprevir or telaprevir and pegylated interferon/ribavirin has been estimated as cost-effective (16). Treatment cost are estimated to be in the range of US\$24000-39000 lifetime disease costs, for liver transplant and for the treatment of decompensated cirrhosis, other than antiviral treatment (17, 18).

Currently the annual costs of acute HCV infection and CHC is nearly 600 million US dollar (19), and it will be expected to be 184 billion US dollar over the period 2010-2019 (20), sofosbuvir-based treatment cost for one patient in the US is 85000-110000 US dollars (13), it is indicating the high burden of chronic HCV infection for national health systems, even country having low prevalence of HCV infection. In the ten European union countries the cost of HCV therapy is approximately €50?million. HCV causing considerable costs to world. The estimate Cost for Spain for HCV infection will be nearly €3?billion over the period of 2010-2030 (21). In Canada the costs are estimated to be 150

million canadian dollars annually until 2040 (22).

Methodology

A cross sectional study based on questionnaire was conducted in village Wali Pur Bura, Nankana sahib, Punjab, Pakistan.

Sample Size

Sample size determined through Daniels equation for our study was 100.

Informed consent

As study was conducted in a village (Nankana Sahab, Punjab Pakistan) where most people were illiterate due to that reason informed consent was taken orally.

Inclusion Criteria

Both males and females having HCV infection, individuals who have had been received treatment against Hepatitis- C, and age above 18 years.

Exclusion Criteria

Pregnant women, individuals having others infectious diseases including Hepatitis A, AIDS and hepatitis B, children are excluded, individuals who are under 18 and alcoholic.

Data Collection Tools

Validated EuroQol 5D-5L urdu version questionnaire tool comprising of five (5) questions covering the various aspects of health was used to assess the health status data of study population. Health status data was further graded up using health scale developed by EuroQol Foundation with due permission.

Data Analysis Tools

Data were analyzed through SPSS version 16 by applying paired sample statistics for comparing two attributes of the study and frequencies were calculated. Patient's quality of life was analyzed through predesigned EU-QOL 5D which includes questions comprising different factors like self-care, mobility, usual activities, depression, pain/discomfort.

Figure 1: Health Score Scale

Ethics of Study

Data was collected after the permission of particular individual either male or female to maintain the ethics of this study. Research procedure was completed under ethical considerations as per Helsinki Declaration, ICH and GCP guidelines. Informed consents were taken from the participants. Confidentiality of their identity and information was made sure. Risk/benefit ratio was measured and the benefits of the study were higher than the risks. Formal permission to carry out the research project in the form of official letter bearing reference number FYR/ ERC/11/2018 was taken from Ethical Committee of Foundation for Young Researchers, Lahore, Pakistan.

Results and Discussion

Table 1: Study Parameters of HCV Patients Related to Pharmacoeconomic Considerations n=100

Parameters	yes		No	
	Frequencies	Percentage	Frequency	Percentage
Treatment through loan	58	58%	42	42%
Knowledge about Government Free Treatment Plan	39	39%	61	61%
Compliance with Prescribed Treatment	53	53%	47	47%
Conventional Treatment	37	37%	63	63%

Table 2: Study parameters of HCV patient related to treatment strategies n=100

Parameters	Category	Frequency (n)	Percentages (%)
Socio-economic Status	Lower Class	70	70%
	Middle Class	30	30%
Monthly Income	less than 20, 000/ Rs.	70	70%
	More than 20, 000/ Rs.	29	29%
Family member	Less than 3	61	61%
	More than 5	39	39%

Out of participants 70 % patients were belong to the lower class and having monthly income less than 20,000 and 39% families having more than 5 members and that causes burden on the expenses (Table 2). In developing countries treatment cost of hepatitis is much high (23) and life time health care cost of HCV infected person is much high as compare to healthy person (24). Due to these factors unaffordability of treatment is much common in Pakistan. Due to the poor economic conditions and high treatment cost of HCV 58% patients took loan to get the costly treatment of HCV.

Out of 100 only 39% patients know Punjab Government is providing free treatment (Table 1) but most of they said Government providing medicines only to those who have reference and mostly low quality medicines are dispensed and it is also a time consuming process. More than half of population is unaware of this program. 53% patients were compliant with their treatment this rate is lower because of lack of knowledge. Virologic response of medicine can only be achieved through medicine adherence in HCV patients High cost is the major attribute contributing in noncompliance. It can lead to reduce outcome of therapy and different side effects. Patient motivation is required to optimize therapy outcome (25). Approximately 37% patients were also taking conventional treatment along with allopathic. Out of these many patients were having firm believe that they were cured by conventional treatment.

Table 3: Frequency distribution in different attributes obtained through Euro-qol5D Tool n= 100

Mobility	Frequency (n)	Percentage (%)
I have no problems in walking about	04	04 %
I have slight problems in walking about	25	25 %
I have moderate problems in walking about	33	33 %
I have severe problems in walking about	35	35 %
I am unable to walk	03	03 %
Self-Care		
I have no problems washing or dressing myself	06	06 %
I have slight problems washing or dressing myself	25	25 %
I have moderate problems washing or dressing myself	43	43 %
I have severe problems washing or dressing myself	23	23 %
I am unable to wash or dress myself	03	03 %
Usual Activities		
I have no problems doing my usual activities	03	03 %
I have slight problems doing my usual activities	25	25 %
I have moderate problems doing my usual activities	32	32 %
I have severe problems doing my usual activities	34	34 %
I am unable to do my usual activities	06	06 %
Pain/Discomfort		
I have no pain or discomfort	0	0 %
I have slight pain or discomfort	19	19 %
I have moderate pain or discomfort	16	16 %
I have severe pain or discomfort	18	18 %
I have extreme pain or discomfort	47	47 %
Anxiety/Depression		
I am not anxious or depressed	02	02 %
I am slightly anxious or depressed	05	05 %
I am moderately anxious or depressed	13	13 %
I am severely anxious or depressed	21	21 %
I am extremely anxious or depressed	59	59 %
Health Scale Number		
Below 50 = Health Below Average	60	60 %
50 = Average Health	21	21 %
100 = Excellent Health	19	19 %

Quality of life of people, suffering from Hepatitis C, is badly affected by the. Muscular or joint pains, fatigue, depression and other psychological problems are most commonly associated with this chronic disease (26). Fatigue, either mental or physical, is the most frequently documented complaint of HCV infected patients (27). About 35% patients had severe problem in walking due to poor health condition during HCV infection. 33% had moderate problem in walking. 43% patients had moderate problem in washing or dressing while 23% patients had severe problem while doing dressing. Due to HCV infection 34% patients had severe problems while performing

their usual activities. Many patients had lost their job due to this disease and suffer from severe financial crisis. 47% patients had extreme pain in HCV infection. That was due to extra hepatic symptoms of HCV infection as well as painful interferon therapy. According to findings of present study HCV patients were found be suffering from depression. Out of 100 patients 59% were extremely depressed. It has been reported that HVC have capability to cross blood brain barrier thus leads to mood swings and depression (28) and anti-viral drugs also disturb the psychological health of the patients (27). Irritability and stress associated with HCV patients has a negative impact on their interpersonal relationships that results into to visible change in behavior of HCV patients. That shows significantly compromised or reduced quality of life of HCV patients. This poor quality of life is due to the extra hepatic symptoms of HCV including depression. The above mentioned symptoms e.g. impaired mobility, fatigue and depression disturb the person's working ability all together (29). The high cost of treatment also disturbs the patient's financial life which has impact on patient's quality of life.

Overall health status of the participants was evaluated by employing Health Scale Number as shown in Fig. 1. According to this scale it was found that health of 60 participants out of 100 was Below Average, 21 participants possessed Average Health while 19 participants had Excellent Health (Table 3).

Conclusion

There is a marked decline in the quality of life of patients suffering from hepatitis C. This decline is majorly due to the extra hepatic effects and common symptoms of this disease. Interferon therapy is another reason of compromised health status. Financial status of hepatitis C patients usually declines because the treatment of hepatitis C is not cost-effective. Costly treatment is beyond the reach of majority of rural population that increases the incidence of depression among patients and their families.

Recommendations

Patient compliance can be improved by informing the patients regarding potential side effects of interferon, before starting the interferon therapy. Prevalence of hepatitis C can be decrease in rural areas by providing easy access of Punjab government free treatment plan of hepatitis C to common people.

References

- Mohd Hanafiah K, Groeger J, Flaxman AD, Wiersma ST. Global epidemiology of hepatitis C virus infection: New estimates of age-specific antibody to HCV seroprevalence. *Hepatology*. 2013;57(4):1333-42.
- Jiwani N, Gul RB. A silent storm: hepatitis C in Pakistan. *Journal of Pioneering Medical Sciences*. 2011;1(3):89.
- Manns MP, Buti M, Gane E, Pawlotsky J-M, Razavi H, Terrault N, et al. Hepatitis C virus infection. *Nature Reviews Disease Primers*. 2017;3:17006.
- Shalmani HM, Ranjbar M, Alizadeh AHM. Recommendations for prevention and control of hepatitis C virus (HCV) infection and HCV-related chronic disease. *J Liver*. 2013;3(147):2167-0889.1000147.
- Cho HJ, Park E. Quality of life of chronic hepatitis C patients and its associated factors. *Osong public health and research perspectives*. 2017;8(2):124.
- Miller ER, McNally S, Wallace J, Schlichthorst M. The ongoing impacts of hepatitis c-a systematic narrative review of the literature. *BMC Public Health*. 2012;12(1):672.
- Marinho RT, Barreira DP. Hepatitis C, stigma and cure. *World Journal of Gastroenterology: WJG*. 2013;19(40):6703.
- Scott JD, Gretch DR. Molecular diagnostics of hepatitis C virus infection: a systematic review. *Jama*. 2007;297(7):724-32.
- Alter HJ, Conry?Cantilena C, Melpolder J, Tan D, Van Raden M, Herion D, et al. Hepatitis C in asymptomatic blood donors. *Hepatology*. 1997;26(S3).
- Foster G, Goldin R, Thomas H. Chronic hepatitis C virus infection causes a significant reduction in quality of life in the absence of cirrhosis. *Hepatology*. 1998;27(1):209-12.
- Malhotra P, Malhotra N, Malhotra V, Chugh A, Singh I, Chaturvedi A, et al. Impact of Hepatitis C on Quality of Life.

12. Strauss E, Porto-Ferreira FA, de Almeida-Neto C, Teixeira MCD. Altered quality of life in the early stages of chronic hepatitis C is due to the virus itself. *Clinics and research in hepatology and gastroenterology*. 2014;38(1):40-5.
13. Alter MJ, Margolis HS. Recommendations for prevention and control of hepatitis C virus (HCV) infection and HCV-related chronic disease. 1998.
14. Alter MJ, Kuhnert WL, Finelli L, Control CfD, Prevention. Guidelines for laboratory testing and result reporting of antibody to hepatitis C virus. 2003.
15. Qureshi S, Qazi M, Aziz MT. Pharmacoeconomic analysis of treatment of patients infected with hepatitis C virus. *Pakistan journal of pharmaceutical sciences*. 2018;31(2).
16. Martin NK, Vickerman P, Miners A, Foster GR, Hutchinson SJ, Goldberg DJ, et al. Cost-effectiveness of hepatitis C virus antiviral treatment for injection drug user populations. *Hepatology*. 2012;55(1):49-57.
17. Wong JB, McQuillan GM, McHutchison JG, Poynard T. Estimating future hepatitis C morbidity, mortality, and costs in the United States. *American Journal of Public Health*. 2000;90(10):1562.
18. Siebert U, Sroczynski G, Rossol S, Wasem J, Ravens-Sieberer U, Kurth B, et al. Cost effectiveness of peginterferon α -2b plus ribavirin versus interferon α -2b plus ribavirin for initial treatment of chronic hepatitis C. *Gut*. 2003;52(3):425-32.
19. Moyer L, Mast E, Alter M. Hepatitis C: Part I. Routine serologic testing and diagnosis. *American family physician*. 1999;59(1):79-88, 91-2.
20. Shah BB, Wong JB. The economics of hepatitis C virus. *Clinics in liver disease*. 2006;10(4):717-34.
21. Buti M, San Miguel R, Brosa M, Cabasés JM, Medina M, Casado MA, et al. Estimating the impact of hepatitis C virus therapy on future liver-related morbidity, mortality and costs related to chronic hepatitis C. *Journal of hepatology*. 2005;42(5):639-45.
22. El Saadany S, Coyle D, Giulivi A, Afzal M. Economic burden of hepatitis C in Canada and the potential impact of prevention. *The European Journal of Health Economics*. 2005;6(2):159-65.
23. Obach D, Deuffic-Burban S, Esmat G, Anwar WA, Dewedar S, Canva V, et al. Effectiveness and cost-effectiveness of immediate vs. delayed treatment of HCV-infected patients in a country with limited resources: the case of Egypt. *Clin Infect Dis*. 2014;58(8):1064-71.
24. Razavi H, ElKhoury AC, Elbasha E, Estes C, Pasini K, Poynard T, et al. Chronic hepatitis C virus (HCV) disease burden and cost in the United States. *Hepatology*. 2013;57(6):2164-70.
25. Wilkinson M, Crawford V, Tippet A, Jolly F, Turton J, Sims E, et al. Community-based treatment for chronic hepatitis C in drug users: high rates of compliance with therapy despite ongoing drug use. *Alimentary pharmacology & therapeutics*. 2009;29(1):29-37.
26. Hsu PC, Federico CA, Krajden M, Yoshida EM, Bremner KE, Anderson FH, et al. Health utilities and psychometric quality of life in patients with early and late stage hepatitis C virus infection. *Journal of gastroenterology and hepatology*. 2012;27(1):149-57.
27. Karaivazoglou K, Iconomou G, Triantos C, Hyphantis T, Thomopoulos K, Lagadinou M, et al. Fatigue and depressive symptoms associated with chronic viral hepatitis patients. health-related quality of life (HRQOL). *Ann Hepatol*. 2010;9(4):419-27.
28. Wilson MP, Castillo EM, Batey AM, Sapya J, Aronson S. Hepatitis C and depressive symptoms: psychological and social factors matter more than liver injury. *The international journal of psychiatry in medicine*. 2010;40(2):199-215.
29. Foster GR. Quality of life considerations for patients with chronic hepatitis C. *Journal of viral hepatitis*. 2009;16(9):605-11.