

A study of the awareness of chronic liver diseases among Korean adults

Dae Won Jun^{1,6*}, Yong Kyun Cho^{2,6*}, Joo Hyun Sohn^{1,6}, Chang Hyeong Lee^{3,6},
Seok Hyun Kim^{4,6}, and Jong Ryul Eun^{5,6}

¹Department of Internal Medicine, Hanyang University College of Medicine, Seoul, Korea,

²Department of Gastroenterology, Kangbuk Samsung Hospital, Sungkyunkwan University School of Medicine, Seoul, Korea, ³Department of Internal Medicine, Catholic University of Daegu School of Medicine, Daegu, Korea, ⁴Department of Internal Medicine, Chungnam National University College of Medicine, Daejeon, Korea,

⁵Department of Internal Medicine, Yeungnam University College of Medicine, Daegu, Korea,

⁶Publicity and Casting Committee of 8th Korean Association for the Study of the Liver, Seoul, Korea

Background/Aims: Chronic liver disease is closely associated with lifestyle, and public enlightenment of the lifestyle factors is important in reducing prevalence of chronic liver disease. The KASL (Korean Association for the Study of the Liver) conducted a survey of basic information and epidemiological data regarding chronic liver diseases. **Methods:** A survey of chronic liver disease involving a total of 2,794 respondents was conducted. The respondents included patients and their guardians, visitors for health check-ups, and online pollees who completed a questionnaire on the awareness of fatty liver or chronic liver disease.

Results: Of the entire cohort, 854 (39.7%) said they have had or still have fatty liver or an elevated transaminase level (>40 IU/L), but only 23.4% of the respondents had visited a hospital. It was found that 35% of healthy subjects and 45% of patients and their guardians misunderstood hepatitis B as the hereditary disease. Furthermore, 26% of the subjects responded that patients with inactive hepatitis B do not require regular follow-up. While 17.9% answered that it is not too late to test for liver cancer when symptoms arise, 38.8% believed that liver transplant in liver cancer patients has a low success rate and is thus not recommended. **Conclusions:** Despite the inundation of information and widespread media advertising, the awareness of chronic liver disease is unsatisfactory among Korean adults. Systematic nationwide studies are needed to obtain data and information regarding the prevalence of chronic liver disease and patterns of use of the health-care system. ([Korean J Hepatol 2011; 17:99-105](#))

Keywords: Awareness; Chronic liver disease; Korea

INTRODUCTION

Chronic hepatitis B is a major cause of liver cirrhosis and liver cancer in South Korea and is one of the most important factors of chronic liver disease. Vaccination at the national level starting in the late 1980s has decreased successfully the prevalence of hepatitis B. The prevalence of HBs Ag dropped from 6-8% of the total population in the 1980s to 5.7% of adults and 2-3% of children in the 1990s.^{1,2} According to Korea Health and Nutrition Examination Survey in 1998, the prevalence of HBs Ag recorded

4.5% in the population aged over 10 years and it declined to 3.7% in 2007.³ However, despite the decrease of the prevalence of hepatitis B the prevalence of chronic liver disease and social cost of total chronic liver disease have not been reduced. The amount of money claimed from National Health Insurance Cooperation due to alcoholic liver disease (K70), liver cirrhosis (K74) and other liver disease (K76) increased by 9-16% every year from 2007 to 2008 (Fig. 1).

A reason for the prevalence and the social cost have not been declined despite the decrease of chronic viral hepatitis B, is

Received July 5, 2010; Revised January 5, 2011; Accepted March 7, 2011

Abbreviations: BMI, body mass index

Corresponding author: Joo Hyun Sohn

Department of Internal Medicine, Hanyang University Guri Hospital, 249-1 Gyomun-dong, Guri, Gyeonggi-do 471-701, Korea
Tel. +82-31-560-2225, Fax. +82-31-555-2998, E-mail: sonjh@hanyang.ac.kr

* Dae Won Jun and Yong Kyun Cho have equally contributed to this work.

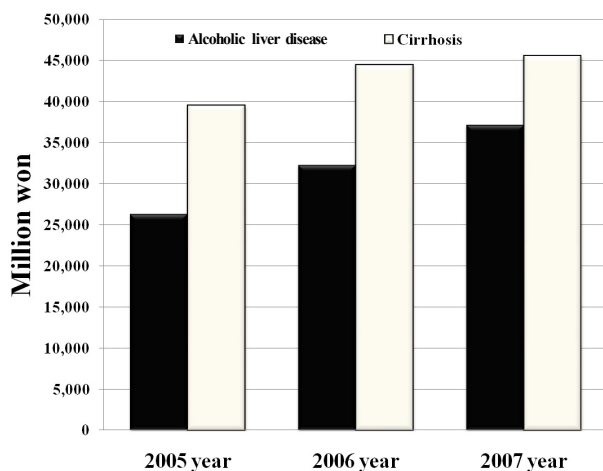


Figure 1. The amount of money claimed from National Health Insurance Cooperation due to chronic liver diseases is increased from the year 2005 to 2007.

considered to be caused by the increase of liver disease related with alcohol, obesity, and herb medicines and supplementary health food. In particular, the increase of alcoholic and nonalcoholic fatty liver disease is clearly observed.^{4,5} Chronic liver disease is closely related with lifestyle, and national promoting and education are the most important to decrease its prevalence. But only a few studies on its basic prevalence, awareness of the general population and actions to deal with it have been conducted.

The Korean Association for the Study of the Liver (KASL) designated 20th October as “The Day of Liver” in 2000 to promote and to improve public health through nationwide promoting and education about liver disease and it has tried to collect basic and epidemiological data about chronic liver disease.

This study aims to investigate and analyze the awareness and the health care utilization of chronic liver disease in the general population, patients and guardians based on the results of questionnaire surveys in 2008 and 2009, to be used for future activities of KASL.

MATERIALS AND METHODS

Questionnaire survey on awareness of fatty liver disease

The questionnaire survey on the awareness of fatty liver disease was conducted to analyze the awareness of nonalcoholic and alcoholic fatty liver disease with totally 2,153 patients and guardians visiting hospitals in September 2008. The questionnaire

consisting of 15 questions were largely divided into three categories of the awareness, the prevalence of nonalcoholic and alcoholic fatty liver and its correlation with socioeconomic factors. To determine the prevalence, the questionnaire examined frequencies of abnormality in fatty liver and blood tests in other medical institutions, health care utilization of fatty liver disease patients, the awareness of causal factors of fatty liver disease and the natural process of the disease. The questionnaire was conducted with patients and their guardians visiting 16 hospitals, persons visiting them for health screening, and participants recruited through the Internet. Respondents read the questionnaire and answered. To calculate the amount of alcohol intake, types of alcoholic beverages and a frequency of alcohol-drinking per week were investigated. Alcohol consumption was calculated by the concentration and amount of intake of alcohol beverages and converted into bottle of *soju* (one bottle of *soju* is equivalent to 72 g alcohol).

Questionnaire survey on awareness of chronic liver disease

The questionnaire containing totally 34 questions examined the awareness of chronic liver disease and the current situation of health care utilization. It consisted of the awareness of chronic hepatitis B, liver cirrhosis and liver cancer. For chronic hepatitis B, the awareness of the natural process of chronic hepatitis, inactive carriers, the therapies for hepatitis B and their periods, side effects of antiviral agents and viral resistance, were examined. For liver cirrhosis, its natural process, management and examination cycles and liver transplantation for it were investigated. For liver cancer, the awareness of the importance of early detection of liver cancer, diagnostic procedures, screening tests and treatments were examined. In addition, the questionnaire on the awareness of each disease investigated health care utilization along with the awareness. The questionnaire survey was conducted with 641 persons visiting the Gastroenterology department in six tertiary hospitals in September 2009.

RESULTS

Demographic characteristics

The respondents of the questionnaire survey on the awareness of fatty liver were totally 2,153 and they consisted of 1,151 (53.5%) males and 1,002 (46.5%) females. Their mean age was 37.7±12.1 years. The participants consisted of visits to hospitals

for health screening, patients and their guardians, and internet questionnaire recorded 27.1%, 63.2% and 7.7%, respectively. For the questionnaire on the awareness of chronic liver disease, the respondents included 327 (51%) females and 314 (49%) males and their mean age was 38.6±11.6 years. Out of them, 34% were patients and their family members, and general persons accounted for 66%.

Awareness of obesity and nonalcoholic fatty liver disease

In the survey on the awareness of fatty liver, 24.4% of the respondents said that it was a natural phenomenon with getting older, and 57% answered that it was a morbid condition. Out of the total respondents, 31.9% responded that fatty liver was found only in persons drinking alcohol, and 76.3% said that fatty liver could proceed to liver cirrhosis or liver cancer (Table 1).

Among the subjects of the questionnaire survey to investigate their awareness of obesity 46.3%, 24.2%, and 24.1% had a normal weight and were overweight and obese, respectively. Actually 49.5% of the subjects, who were underweight, said that they maintained an appropriate weight while 38.3% of the overweight ones answered that they had a proper weight. So, the awareness of their own weight was found to be distorted (Fig. 2).

Out of the total respondents, 854 (39.7%) responded that they had heard to have fatty liver or abnormal results of liver function tests. However, 23.4% visited hospitals or clinics due to these problems. Among the subjects with abnormal results of liver function test, 68.7% visited doctors. Among the subjects with fatty liver, 47.6% visited medical institutions.

Awareness of alcohol intake and alcoholic liver disease

The participants of the survey drank averagely 1.07 bottles of *soju* per week. The male and female subjects drank 1.7 and 0.4

bottles per week based on *soju*, respectively. Thirty percent of the male subjects drank more than two bottles of *soju* per week, and 7.9% of the female ones did more than one bottle of *soju* per week. When it was asked whether the current alcohol intake was appropriate, 983 (45.7%) and 658 (30.6%) said that they consumed alcohol properly and much, respectively. However, 24.4% of the subjects drinking over two bottles of *soju* answered that they took it appropriately. Among those drinking over two bottles of *soju*, 46.8% and 44.5% had fatty liver and abnormality in liver function test, respectively.

When the respondents were recommended to stop drinking alcohol due to alcoholic fatty liver, 77.4% said that they would quit drinking alcohol. However, only 51.9% of the subjects drinking over two bottles per week had an intention to stop drinking alcohol despite the recommendation of doctors. Out of the respondents, 29.9% and 30.8% had heard to have fatty liver and abnormality in liver function test at hospitals, respectively.

Sociological factor associated with fatty liver disease

Association between socioeconomic factors and fatty liver

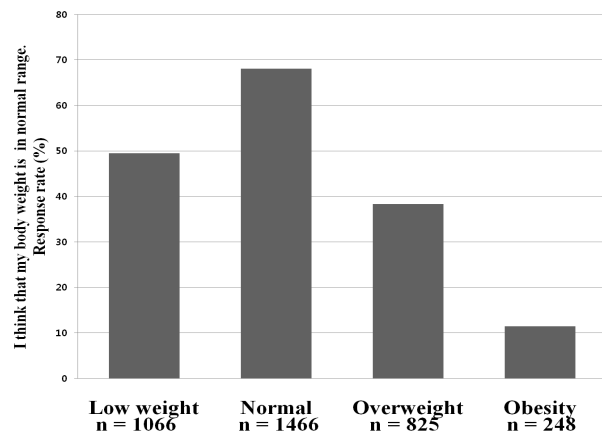


Figure 2. The considerable number of respondents have a distorted awareness about their own body shape.

Table 1. Awareness survey for fatty liver disease

	Yes	No	Other	Total
Fatty liver is a phenomenon observed with getting older and it is not a disease.	525 (24.4)	1,227 (57)	401 (18.6)	2,153
Fatty liver is found only in persons drinking alcohol frequently.	687 (31.9)	1,270 (59.0)	196 (9.1)	2,153
Fatty liver can be observed in cases of diabetes or obesity.	1,630 (75.7)	125 (5.8)	398 (18.5)	2,153
Fatty liver can proceed to liver cirrhosis.	1,643 (76.3)	114 (5.3)	396 (18.4)	2,153

Data represents number of respondents (%).

disease and health care utilization were analyzed. Among the subjects, 61 (2.9%), 102 (5.0%), 542 (25.2%), 1098 (51.0%) and 246 (11.4%) graduated an elementary school, graduated a middle school, a high school, a college, and a postgraduate school as a final educational background, respectively, and 105 did not respond the background. When the amount of alcohol intake was compared by educational status, the mean alcohol intake recorded the lowest in the subjects graduating an elementary school, while it showed the highest level in those graduating a high school, and it was followed by those graduating a college. Although lower educational background was associated with higher rate of obesity, the difference was not statistically significant. Lower educational background showed higher rates of associating with liver disease and of visiting hospitals due to liver disease (Table 2).

Awareness of chronic hepatitis B

As 78.2% of the subjects recognized chronic hepatitis B as a

chronic disease and said that it needed a long-term follow-up, 21.8% did not perceive the necessity of long-term examinations. For hepatitis B virus carriers, 26.1% responded that it did not need any additional tests.

When the knowledge about antiviral agents currently used to deal with chronic hepatitis B was examined, most of the respondents did not know effects and purposes of the use of the antiviral agents. Only 68-75% answered that the use of antiviral agents could prevent or delay the occurrence of liver cirrhosis and liver cancer, and 25-31% did not aware the purpose of the antiviral agents. In addition, 35.9% of the respondents said that a short-term treatment for one to two years was sufficient (Table 3). Thirty two percents in the general population and 45% in patients and their guardians considered hepatitis B as a genetic disease.

Awareness of liver cirrhosis

Out of the respondents 67% answered that liver cirrhosis was

Table 2. Sociological analysis of fatty liver disease

	Elementary school or lower (n=61)	Middle school (n=102)	High school (n=542)	College (n=1098)	Postgraduate school or higher (n=246)	* P-value
BMI (kg/m ²)	23.9±3.5	23.3±3.7	23.2±6.3	22.8±9.3	23.8±13.5	0.531
Obesity (BMI≥25), n (%)	762 (35.4)	560 (26.0)	558 (25.9)	491 (22.8)	452 (21.0)	0.24
Mean alcohol intake per week (soju, bottle)	0.80±1.2 ^a	1.04±1.3 ^a	1.35±1.8 ^b	1.16±1.8 ^b	1.02±1.5 ^a	0.041
Association with liver disease, n (%)	20 (40.0)	38 (38.4)	164 (30.8)	198 (18.1)	38 (15.5)	<0.001
Visit to a medial institution due to liver disease, n (%)	18 (35.3)	33 (32.4)	132 (24.4)	189 (17.2)	33 (13.4)	<0.001

* P<0.05 by ANOVA and Chi-square, mean±SD, n (%).

Table 3. Awareness survey for chronic hepatitis B

	Yes	No	Total
Hepatitis B needs a regular follow-up as it is a lifelong disease.	501 (78.2)	140 (21.8)	641
Hepatitis B carriers (inactive) do not need to be followed up regularly.	167 (26.1)	474 (73.9)	641
For hepatitis B, strengthening physical fitness and immunity without any specific medication is the best treatment.	321 (50.1)	320 (49.9)	641
Antiviral agents can delay the progression to liver cirrhosis.	478 (74.5)	163 (25.5)	641
Antiviral agents can reduce the risk of liver cancer.	437 (68.2)	204 (31.8)	641
For antiviral agents to treat hepatitis B, a short-term use is sufficient due to the risk of resistance after long-term use.	230 (35.9)	411 (64.1)	641

Data represents number of respondents (%).

Table 4. Awareness survey for cirrhosis

	Yes	No	Total
It is impossible to recover from cirrhosis.	428 (66.7)	213 (33.3)	641
For liver cirrhosis, it is the best treatment to alleviate symptoms and to delay its process.	403 (62.8)	238 (37.2)	641
For liver cirrhosis, regular examinations and treatments are necessary.	599 (93.5)	42 (6.5)	641
Liver cirrhosis can be detected easily through general health screening.	368 (57.4)	273 (42.6)	641
Liver cirrhosis can be treated with liver transplantation, however, its success rate is not high.	294 (45.8)	347 (54.2)	641
The combination of folk remedies and medical treatments for liver cirrhosis is helpful.	294 (45.8)	347 (54.2)	641

Data represents number of respondents (%).

Table 5. Awareness survey for liver cancer

	Yes	No	Total
Liver cancer is curable disease if it is detected early.	553 (86.3)	88 (13.7)	641
Liver cancer is hard to be treated if it detected late.	494 (77.0)	147 (23.0)	641
Liver cancer can be detected easily through simple blood test.	297 (46.4)	344 (53.6)	641
Liver cancer patients are treated only with resection or transplantation.	388 (60.6)	253 (39.4)	641
Liver transplantation is available, however, it is not recommended due to its low success rate.	249 (38.8)	392 (61.2)	641
Tests of liver cancer should be performed after its symptoms are observed.	115 (17.9)	526 (82.1)	641
Liver cancer often recurs after surgical treatment.	439 (68.5)	202 (31.5)	641
Patients with hepatitis B, hepatitis C and liver cirrhosis are high risk groups of liver cancer.	528 (82.4)	113 (17.6)	641
Liver transplantation is a good option for the treatment of liver cancer and advanced cirrhosis.	444 (69.3)	196 (30.6)	641

Data represents number of respondents (%).

not curable by medical treatment (Table 4). As much as 62.8% of the subjects thought that there was no specific therapy for the disease, and 45.8% answered that the success rate of liver transplantation was high. Forty five percents responded that folk remedies were helpful for the treatment of liver cirrhosis.

Awareness of liver cancer

Among the respondents, 86.3% said that liver cancer detected early could be treated well. However, 46.4% answered that liver cancer could be diagnosed only with blood test, and 17.9% did that it was not late to screen liver cancer when there was a symptom. Moreover, 17.6% of the total respondents did not know that chronic liver disease was a high risk factor of liver cancer. Although 69.3% responded that the association of liver cirrhosis and liver cancer could be treated effectively with liver

transplantation, 38.8% said that the transplantation was not recommended because of its low success rate in liver cancer patients. In other words, the awareness of liver transplantation varied (Table 5).

DISCUSSION

The prevalence of chronic liver disease is high in Korea, However, studies on its management and awareness are limited. In addition, most of them were performed in the 1990s when health care system was not established well, their subjects were medical staffs and they were conducted in specific regions. In other words, there has been nearly no large scale research performed with actual chronic liver disease patients.^{6,7} In 2000, KASL designated October 20th as the Day of Liver for a national

promoting for prevention and management of liver disease. This nationwide survey was conducted with over 2,000 general persons and patients by 'KASL'. Moreover, it is meaningful as it includes subjects recruited through various routes such as health screening and the internet as well as patients and their guardians visiting hospitals.

In the analysis on the awareness of fatty liver, the rate of perceiving fatty liver as a disease was low although nonalcoholic fatty liver patients increased due to a rapid growth of obese population. According to this survey, 24.4% thought that fatty liver was one of aging effects and only less than half of the subjects, who had heard to have fatty liver or abnormality of liver function, visited medical institutions to cope with it. Considering that other survey performed with hepatitis B patients revealed that the rates of following up them and examining their families recorded only 21.4% and 39.3%, respectively,⁸ more active promoting and management programs to improve the public awareness of chronic liver disease are necessary. Moreover, as many underweight or overweight persons thought themselves to have a normal weight because of a distorted perception of a normal weight and obesity, education and promoting of obesity should be conducted appropriately.

Socioeconomic factors are generally known to affect the prevalence of chronic adult disease like hypertension and diabetes.⁹ This study found that the socioeconomic factors influenced not only the morbidity rate of chronic liver disease but also health care utilization. Although educational background, job and income level of the subjects needed to be evaluated to assess the effect of socioeconomic factors. This study examined only educational background to determine a socioeconomic level. The respondents with lower educational background tended to have higher prevalence of liver disease and higher frequency of visiting medical institutions. This finding shows that socioeconomic factors should be considered to understand health care utilization of chronic liver disease patients and to establish a management system for them.

With the development of various antiviral agents, hepatologists recognize chronic hepatitis B as a manageable chronic disease. However, ordinary people seem to misunderstand the use of antiviral agents. Many people are reluctant about the long term use of antiviral agent. That is thought to be caused mainly by worry about the resistance and the side effects of antiviral agents. Moreover, an excessive trust in oriental herbs and folk remedies were found to work as obstacles of treatment and management of hepatitis B in South Korea. For the use of antiviral agents, it is

necessary to persuade patients and their guardians to understand sufficiently the possibility of long-term use and the reasons for it. In addition, 32% of the patients and 45% of the guardians wrongly perceived hepatitis B as a genetic disease and many respondents wrongly considered that the disease was infected among family members in daily life due to its strong infectivity in many cases. To manage hepatitis B appropriately, more active and systematic promoting is necessary.

The current improvement of liver transplantation techniques and the development of immunosuppressants lead to higher success rate of liver transplantation, so it is recognized as a good treatment for liver cancer as well as advanced liver cirrhosis. However, as show in the results of this study, over 60% of the respondents knew that advanced liver cirrhosis and liver cancer could be treated by liver transplantation and surgical methods but more than half of them thought the transplantation negatively because of its low success rate. Therefore, promoting of positive outcomes of liver transplantation to treat liver cirrhosis and liver cancer are needed.

One of limitations of this study is that structural validity and internal validity of the questions in the questionnaire are not proven. Some questions are not clear and too difficult to understand of unfamiliar medical terminology, so some answers were shifted to one side. This survey has concerns about a lack of order of the questions. Certain questions provoke positive or negative effects on a following question, but it were not fully considered. So, more systematic and structured questionnaires need to be invented in the future.

In conclusion, despite the development of mass media and the continuous promoting of KASL, there is still wrong awareness of chronic liver disease. Systemic nationwide study is consistently required for investigation of the prevalence of chronic liver diseases and health care utilization of the patients.

Acknowledgements

We sincerely appreciate efforts of the members of KASL joining open health lectures, free health screening and this questionnaire surveys conducted on 'the Day of Liver' held by KASL in 2008 and 2009. The study was presented in the ceremony of 'the Day of Liver' of KASL in 2008 and 2009.

REFERENCES

1. Joo KR, Bang SJ, Song BC, Youn KH, Joo YH, Yang S, et al. Hepatitis B viral markers of Korean adults in the late 1990s: Survey data of

- 70,347 health screenees. Korean J Gastroenterol 1999;33:642-652.
2. Sim JG, Seo JK, Suh SJ. Prevalence and its changes of hepatitis B viral markers from 1988 to 1993 in Korean children. J Korean Pediatr Soc 1995;38:1535-1539.
 3. Korean National Health and Nutrition Examination Survey (KNHANES). The Positive Rates of hepatitis B surface antigen. 2005. KNHANES Web site (online), <<http://knhanes.cdc.go.kr/>> Accessed March 19, 2009.
 4. Seo SH, Lee HW, Park HW, Jang BG, Chung WJ, Park KS, et al. Prevalence and associated factors of nonalcoholic fatty liver disease in the health screen examinees. Korean J Med 2006;70:26-32.
 5. Lee KE, Kim YM, Kang ES, Kim HJ, Chung HW, Lee SH, et al. Metabolic significance of non-alcoholic fatty liver disease in non-obese adults. Korean J Med 2002;63:488-495.
 6. Paik JJ, Lee HJ, Lee YH, Lee K, Park TJ. The concept and management of hepatitis B infection-Difference between general practitioners and hepatologists. J Korean Acad Fam Med 1998;19:326-336.
 7. Han JH, Lee DC, Lee HR, Park HW, Jung GC, Park SG. Knowledge of hepatitis B and follow-up test in HBs Ag positive patients. J Korean Acad Fam Med 1997;18:706-713.
 8. Kim IH, Kim OM, Lee CG. Hepatitis B examination and recognition change after 1 year in girls' high school students. J Korean Acad Fam Med 2001;22:1271-1278.
 9. Disano J, Goulet J, Muhajarine N, Neudorf C, Harvey J. Social-economic status and rates of hospital admission for chronic disease in urban Canada. Can Nurse 2010;106:24-29.