Abstract

Background: Infections caused by hepatitis B virus (HBV) and hepatitis C virus (HCV) are considered to be important health problems worldwide. The purpose of this study was to measure the general practitioners (GPs)’ basic knowledge on HBV and HCV risk factors in determining their practice about this subject.

Methods: A cross-sectional type questionnaire survey was carried out at all of 32 primary healthcare centers (PHCCs) in Samsun, Turkey, between March 1 and April 31, 2002. The questionnaires were sent to 160 GPs and 129 (80.6%) of them answered the questionnaires. Knowledge, role responsibility, self-efficacy and attitudes and beliefs regarding to viral hepatitis B and hepatitis C were asked.

Results: Most of the GPs had adequate knowledge about transmission of HBV and HCV and also about risk factors for transmission of viruses. Most of the GPs (83.7%) were aware of recommendations for approach to a baby, born from HBsAg positive mother. They have limited facilities in diagnosis of viral hepatitis. Of the participants, 108 (83.7%) expressed that they could not diagnose HBV infections and 126 (97.7%) of them stated that they could not make the diagnoses of HCV infection in their local healthcare centers. The knowledge about treatment of chronic viral hepatitis B (21.8%) and C patients (17.8%) with elevated ALT is not sufficient.

Conclusion: GPs’ knowledge about risks of viral hepatitis was adequate in this study. They were not able to diagnose and follow up of these infections at PHCCs because of limited knowledge about chronic viral hepatitis and diagnostic facilities. GPs should be informed about current advice in diagnosis and treatment of chronic of HBV and HCV infections.
Background
Infections caused by hepatitis B virus (HBV) and hepatitis C virus (HCV) are important health problems worldwide with a high morbidity and mortality [1-3]. It is known that 400 million people are HBV carriers and that each year 50 million people contact such a disease, resulting in 1–2 million deaths [3]. Infection with HCV occurs worldwide, the prevalence of antibody against HCV (anti-HCV) in serum in most developed countries range between 1% to 2% [2]. It is also reported that currently 170 million people all over the world are infected with HCV infections and that 8000 – 10000 people die from HCV infection and of complications per year [4,5]. Turkey, located in a region with moderate risk, has a prevalence in a range of 1.0% to 2.4% [6]. The prevalence of HCV infection was reported 1.5% in Turkey [7].

The hepatitis caused by HBV and HCV is extremely obscure. Symptoms appear only in 35.0% of those infected by HBV and in 25.0% of those infected by HCV. However, HBV and HCV are highly transmittable. Therefore, a decision made by World Health Organization (WHO) and National Institute of Health (NIH) suggests that all the patients should be examined with respect to their risk factors for HCV [8]. Turkey falls into the medium endemisity group in terms of HBV and HCV infection prevalence [3,6]. Such infections develop without any clear symptoms, so it is very important to carry good performance by the GPs in terms of diagnosis, treatment and follow up of patients. Therefore we attempted to evaluate the current practices, knowledge, attitudes of GPs regarding viral hepatitis B and C.

Methods
A cross-sectional study was carried out at all of 32 primary healthcare centers (PHCCs) in the central district of Samsun, Turkey between March 1 and April 31, 2002. The questionnaires were sent to all GPs (n = 160). One hundred and twenty-nine of 160 (83.7%) GPs from different PHCCs completed the survey. The non-respondent GPs randomly distributed in PHCCs. The questionnaire was self-administered anonymously with an answer sheet. Questionnaire [see Additional file 1]. Question format ranged from closed questions with multiple choices to open comment and true/false type. Demographic variables such as gender, age and practice period in PHCCs were assessed. Also the information was collected regarding diagnostic facilities at PHCCs. The survey questionnaire includes a multiple-choice question relevant to sources of medical information. A question in medical knowledge about transmission of hepatitis viruses includes ten statements. GPs were asked to define these statements as correct or incorrect. This question was all marked out of 100. Ten points were given for each correct choice the participants' marked and incorrect choice they left untouched. Participants were asked: "What would you suggest to do to protect an infant, born from a HBsAg positive mother?" The answers were: Injection of hepatitis B vaccine and hepatitis B immunoglobulin (HBIG), offering only hepatitis B vaccine, offering only HBIG, delivery by caesarean section and no knowledge about the problem.

Clinical practice was evaluated with the questions in the following: "What is the approximate number of individuals with acute or chronic viral hepatitis whom you diagnosed or followed up? Approximately how many individuals with acute or chronic viral hepatitis have you seen in the past 12 months?" Answers were obtained using fill-in-the-blank spaces.

Current knowledge about patient management based on four sample case presentations (below) was investigated with multi-choice answers.

Sample Cases
Case-I
A 35 years old woman with chronic hepatitis B admitted to a primary health care center. Her serum alanine aminotransferase (ALT) level was normal.

Case-II
A 40 years old man has been positive for HBsAg (+) for three years and two consecutive ALT results were 125 IU/L and 120 IU/L, respectively.

Case-III
A healthy/asymptomatic 55 years-old man admitted to a primary health care center. His alanine aminotransferase (ALT) level was normal.

Case-IV
A healthy/asymptomatic 32 years-old woman admitted to a primary health care center. Her anti-HCV in ELISA was positive blood donation and ALT level was normal at subsequent work-up. She had no risk factors.

Shebab et al. [9] originally used the cases that were related to HCV in a survey.
GPs were asked: What their next step would be, which additional test they would order, which treatment regimen they would recommend and if they would order a therapy recommended by a specialist, in the view of these cases.

In the text the results were given as means ± standard deviations (SD).

Results
The questionnaire was completed anonymously, of the 160 surveys, 129 (83.7%) were received and investigated using the data analysis.

Demographic characteristics
Of the study group, 72 (55.8%) GPs were women and 57 (44.2%) were men. The mean age of participants was 31.3 ± 4.8 years. They had been in practice for 7.2 ± 4.6 years.

Knowledge about transmission of HBV and HCV
Blood transfusion (96.1%, 95.3%), blood and body fluids (95.3%, 94.6), sexual transmission (89.9%, 89.9%), intravenous drug use (91.5%, 90.7%) and vertical transmission (88.4%, 80.8) were listed as the most responsible risk factors for HCV and HBV, respectively, by the GPs.

When the participants were asked about their suggestions of how to protect an infant, born from a HBsAg positive mother, it was stated by 108 (83.7%) of the participants that Hepatitis B vaccine should be injected to the infant during its delivery in addition to the immunoglobulin therapy. Twenty (15.5%), 12 (9.3%), 7 (5.4%) and 7 (5.4%) are the number of the given answers in 129 GPs for the following questions respectively; baby should be taken out by caesarean section, only immunoglobulin should be given at birth, only Hepatitis B vaccine should be applied at birth and did not actually know what to do.

When the participants were asked about what they would suggest do to protect an infant, born from an anti-HCV and HCV RNA positive mother, it was stated by 67 (51.9%) of them that there were no preventive measures to be taken during the birth and the baby should be followed with respect to HCV infection. Thirty-four (26.4%), 33 (25.6%) and 7 (5.4%) of them suggested that immunoglobulin should be applied to the baby at birth, the birth should be carried out by caesarean section, and they aware not actually well informed about the case, respectively. The participants could choose more than one solution regarding protection of baby from viral hepatitis.

Experience with viral hepatitis
GPs reported that they had no diagnostic laboratory tests for HBV (108; 83.7%) and HCV (126; 97.7%). Because of the lack of diagnostic laboratory tests, these diseases could not be diagnosed at their PHCCs.

One hundred and ten (85.3%) of the participants expressed that no patient with acute HBV (AHB) infection admitted to their health care centers and 84 (65.1%) of them stated that they did not encounter any patient with chronic HBV (CHB) infection during the last 12 months. Rest of 45 GPs encountered total 52 patients at previous year; only 6 GPs examined more than one patient. One hundred and twenty-six (97.7%) of them reported that they did not encounter any patient with HCV infection.

Approach to sample cases
Table 1 shows the criteria used by the participants in the management of the two cases with HBV infection.

| Table 1 | Criteria used by the participants in the management of the two cases with HBV infection |
|-------------------------|--------------------------------------------------------------------------------------------------|
| **Blood transfusion** | 96.1% (95.3%) |
| **Blood and body fluids** | 95.3% (94.6%) |
| **Sexual transmission** | 89.9% (89.9%) |
| **Intravenous drug use** | 91.5% (90.7%) |
| **Vertical transmission** | 88.4% (80.8%) |

Sources of education
The answers given by the participants about the sources of the updated current information for HBV and HCV infections were as follows, respectively: using journals: 63.6%, 52.7%, attending to congress: 14.0%, 11.6%, using books: 79.1%, 76.7% and on-line sites: 3.1%, 3.1% (The sum of the answer is higher than the number of the participants for the participants checked more than one item.)

Discussion
Our data suggest that, the high response rate to our questionnaire indicated that GPs find the problem as an important area to consider. The sample was representative of GPs in Samsun region. The results could be extrapolated to whole Turkey on the basis of educational levels and working conditions, although the practice years of the respondents seem to be smaller than in practice.

HBV and HCV cause chronic viral hepatitis [10]. The frequency of the HBV and HCV infections are high in developing countries, including Turkey, especially young children who become infected with HBV are the most likely to develop chronic infection [5,6,11]. Therefore, GPs who constitute almost half of primary health care and outpatient services are expected to know basic knowledge on such infections. Furthermore, they are also supposed to guide their patients appropriately in terms of analysis of their diseases and treatment. GPs should be able to identify HBV and HCV high-risk groups at an early period because of the high importance of the complications like cirrhosis and hepatic failure [6,9,12]. The majority of GPs were well informed about transmission ways for HBV and HCV. However they identified sexual and vertical transmission as being important risk factors for HCV, the estimated transmission risk is only 5% [13]. This indicates...
confusion between modes of transmission for HBV and HCV. The relatively poorer levels of knowledge about transmission of HCV obtained in this study may also be found in the general population. Therefore strategic programmes of health education and awareness rising to both professionals and public are recommended.

Up to 90% of infants of highly infected with HBsAg and HBeAg positive mothers become HBV carriers compared with 10% to 40% of babies born anti-HBe positive mothers. HBV vaccine and HBIG should be applied at birth to the baby born to a HBsAg positive mother [14]. Due to the data gathered at the end of these studies the transmission is not effected by the way of the baby delivery and breastfeeding. Since the frequency of vertical transmission is less than 5%, there was no special recommendation for anti-HCV positive pregnant women [13,15,16]. This study shows that most GPs are practicing within current recommendations regarding hepatitis B immunization of infants, but the use of vaccine and HBIG at birth to the baby born to a HBsAg positive mother [14]. Due to the data gathered at the end of these studies the transmission is not effected by the way of the baby delivery and breastfeeding. Since the frequency of vertical transmission is less than 5%, there was no special recommendation for anti-HCV positive pregnant women [13,15,16]. This study shows that most GPs are practicing within current recommendations regarding hepatitis B immunization of infants, but the use of vaccine and HBIG at birth to the baby born to a HBsAg positive mother [14]. Due to the data gathered at the end of these studies the transmission is not effected by the way of the baby delivery and breastfeeding. Since the frequency of vertical transmission is less than 5%, there was no special recommendation for anti-HCV positive pregnant women [13,15,16]. This study shows that most GPs are practicing within current recommendations regarding hepatitis B immunization of infants, but the use of vaccine and HBIG at birth to the baby born to a HBsAg positive mother [14]. Due to the data gathered at the end of these studies the transmission is not effected by the way of the baby delivery and breastfeeding. Since the frequency of vertical transmission is less than 5%, there was no special recommendation for anti-HCV positive pregnant women [13,15,16]. This study shows that most GPs are practicing within current recommendations regarding hepatitis B immunization of infants, but the use of vaccine and HBIG at birth to the baby born to a HBsAg positive mother [14]. Due to the data gathered at the end of these studies the transmission is not effected by the way of the baby delivery and breastfeeding. Since the frequency of vertical transmission is less than 5%, there was no special recommendation for anti-HCV positive pregnant women [13,15,16]. This study shows that most GPs are practicing within current recommendations regarding hepatitis B immunization of infants, but the use of vaccine and HBIG at birth to the baby born to a HBsAg positive mother [14].
chronic hepatitis C patients with elevated ALT in case III. Twenty-four point eight percent of them recommended either IFN-α or lamivudine to treat chronic viral hepatitis B in case II. The remainder GPs did not actually know what to do with such patients. Therefore the knowledge of treatment options in chronic hepatitis B and C is poor, this may decrease the ability to accurately assess patients and initiate therapy. This clearly identifies that regular updates on current treatments are needed. Protocols, reviews and consensus reports have been useful in the management of chronic viral hepatitis [17-19].

General practitioners reported medical books and journals to be the most useful source of information regarding viral hepatitis but were concerned about inadequate timely access the journal and also the low rate of obtaining information from on-line sites. However internet may be a solution for difficulties and delays in obtaining relevant information. Most of the updated guidelines and consensus reports have been useful in the management of chronic viral hepatitis [17-19].

In order to prevent HBV and HCV infections, GPs drive great responsibility of the diagnosis and treatment of the infected patients as well as their follow up. This study demonstrates high awareness of the transmission of viral hepatitis and high-risk groups among GPs but also considerable knowledge gaps about the timing of ordering diagnostic tests and treatment recommendations. Results suggest several opportunities for improvement. Efforts to educate the GPs about the appropriateness and importance of identification of HBV and HCV infection during post-graduation period should be improved. PHCCs should be technically supported to ease the diagnosis of HBV and HCV infections. Finally further coordination between an advanced health care center and specialists should be established to enable such infections to be followed up in PHCCs.

### Competing interests
None declared.

### Authors’ contributions
YP participated in the design and coordination of the study, SC drafted the questionnaire and participated in study design and coordination. HL conceived the study, paritcated in its design and drafted the manuscript. MS and SE provided clinical expertise in interpretation of data and drafting manuscript. ATS provided drafted the manuscript and performed the statistical analysis. All authors read and approved the final manuscript.

### Table 2: Management of Patients with HCV

| At this point your next step would be to: | Case III | Current Advice | Case IV | Current Advice |
|------------------------------------------|-----------|----------------|---------|----------------|
| Repeat the measurement of anti-HCV       | 16        | 12.4 No        | 49      | 38 No          |
| Follow in clinic: refer if symptoms develop | 5        | 3.9 No         | 30      | 23.2 Yes       |
| Refer to a specialist                    | 108       | 83.7 Yes       | 50      | 38.8 Yes       |
| Don’t know                               | -         | -              | -       | -              |

Which additional tests would you order (check all that apply)*:
- anti-HCV ELISA: 52 40.3 No 50 38.8 No
- anti-HCV RIBA: 2 1.6 Yes 4 3.1 Yes
- HCV-RNA by PCR: 105 81.4 Yes 106 82.2 Yes
- HCV genotyping: 3 2.3 No 9 7.0 No

If you order therapy, which regimen would you recommend:
- IFN-α for 6 months: 23 17.8 No 20 15.5 No
- IFN-α for 12 months: 4 3.1 No 4 3.1 No
- Ribavirin alone: - - No - - No
- IFN-α and Ribavirin: 23 17.8 Yes 24 18.6 No
- Don’t know: 79 61.3 81 62.8

* The sum of the answer is higher than the number of the participants for the participants checked more than one item.
Additional material

Viral Hepatitis Questionnaire. A questionnaire to evaluate the current practices, knowledge, attitudes of general practitioners regarding viral hepatitis B and C.

Additional File 1

References
1. Chen DS: From hepatitis to hepatoma: lessons from type B viral hepatitis. Science 1993, 262:369-370.
2. Di Bisceglie AM: Hepatitis C. Lancet 1998, 351:351-355.
3. Lee WM: Hepatitis B virus infection. N Engl J Med 1997, 337:1733-1745.
4. Alter MJ: Epidemiology of hepatitis C. Hepatology 1997, 26:625-655.
5. Global surveillance and control of hepatitis C. Report of a WHO Consultation organized in collaboration with the Viral Hepatitis Prevention Board, Antwerp, Belgium. J Viral Hepat 1999, 6:35-47.
6. Hepatitis C--global prevalence (update). Wkly Epidemiol Rec 2000, 75:18-19.
7. Thomas DL, Mahley RW, Badur S, Palagru E, Quinn TC: The epidemiology of hepatitis C in Turkey. Infection 1994, 22:411-414.
8. Recommendations for prevention and control of hepatitis C virus (HCV) infection and HCV-related chronic disease. Centers for Disease Control and Prevention. MMWR Recomm Rep 1998, 47:1-39.
9. Shehab TM, Sonnad SS, Lok AS: Management of hepatitis C patients by primary care physicians in the USA: results of a national survey. J Viral Hepat 2001, 8:377-383.
10. Ryder SD, Beckingham IJ: ABC of diseases of liver, pancreas, and biliary system: Chronic viral hepatitis. BMJ 2001, 322:219-221.
11. Chang MH: Natural history of hepatitis B virus infection in children. J Gastroenterol Hepatol 2000, 15 Suppl 1: E16-E19.
12. Fattovich G: Natural history and prognosis of hepatitis B. Semin Liver Dis 2003, 23:47-58.
13. Effects of mode of delivery and infant feeding on the risk of mother-to-child transmission of hepatitis C virus. European Paediatric Hepatitis C Virus Network. BJOG 2001, 108:371-377.
14. Sexually transmitted diseases treatment guidelines 2002. Centers for Disease Control and Prevention. MMWR Morb Mortal Wkly Rep 2002, 51:1-78.
15. Dal Molin G, D’Agaro P, Ansaldi F, Ciana G, Fertz C, Alberico S, Campello C: Mother-to-infant transmission of hepatitis C virus: rate of infection and assessment of viral load and IgM anti-HCV as risk factors. J Med Virol 2002, 67:137-142.
16. Zanetti AR, Tanzi E, Newell ML: Mother-to-infant transmission of hepatitis C virus. J Hepatol 1999, 31 Suppl 1:96-100.
17. EASL International Consensus Conference on Hepatitis B. 13-14 September, 2002: Geneva, Switzerland. Consensus statement (short version). J Hepatol 2003, 38:533-540.
18. Chongsrisawat V, Poovorawan Y: Management of chronic hepatitis B and C virus infections. Indian J Pediatr 2002, 69:149-154.
19. National Institutes of Health Consensus Development Conference Statement: Management of hepatitis C: 2002--June 10-12, 2002. Hepatology 2002, 36:S3-20.

Pre-publication history
The pre-publication history for this paper can be accessed here:

http://www.biomedcentral.com/1471-230X/4/3/prepub