Clinical epidemiological study of Hepatitis B and C

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Abstract

Hepatitis is the inflammation of liver and is caused by some specific RNA & DNA viruses. Hepatitis B Virus (HBV) is a partially double stranded DNA virus. HBV infection is parentally transmitted and is not transmitted through intact skin. HCV is a single stranded RNA virus and HCV shows considerable heterogeneity, particularly in the viral envelope. The clinical effect of adefovir dipivoxil regimen was compared with lamivudine in the management of chronic hepatitis B patients. The clinical effect of regimen of peg interferon alfa 2a with those of a regimen of interferon alfa 2a in the initial treatment of patients with chronic hepatitis C was also compared. High prevalence of HCV in female in Pakistan may be due to illiteracy and non preventable behavior of female. Peg interferon alfa-2a was found more potent as it was associated with a higher rate of virological response than that of interferon alfa-2a at week 24 (72.7% versus 68.18%). The response of adefovir dipivoxil associated with a higher rate of HBV DNA reduction with those of a regimen of lamivudine in the management of patients with chronic hepatitis B was (72.7% versus 62.5%). Adverse events were similar across groups; including upper respiratory symptoms, headache, back pain and diarrhea.

INTRODUCTION

Hepatitis A virus (HAV) is a self-limited faecally spread disease. Hepatitis B Virus (HBV) is blood borne pathogen and can be transmitted parentally, sexually, perinatally or by saliva (Kreutz, 2002). HBV is endemic in Pakistan and carrier rate of HBsAg is quoted from 2 to 11% in asymptomatic adults (Akhtar et al., 2005; Kolachi et al., 2006). Hepatitis C virus (HCV) is parentally spread disease with high chronic rate and prevalence of HCV is estimated to 3% globally (Sherlock and Dooley, 2006).
HCV patients from the different part of the world can be divided into six main genotypes. The major clinical difference between genotypes is the response to antiviral therapy (Simmonds et al., 1999). The transmission of HCV is declining worldwide as a result of the screening of blood products and implementation of standard precautions (Armstrong et al., 2000). Normalization of liver enzyme levels, viral suppression and clearance, reduction in histologic scores of liver inflammation or fibrosis, and combinations of these outcomes have been used to measure response to antiviral drugs or development of antiviral resistance (Lok and McMahon, 2007; Hoofnagle et al., 2007). Progression from acute to chronic HBV infection is influenced by the patient’s age at acquisition of the virus; age is also related to the clinical expression of HBV infection between high-prevalence (e.g., Asian) and low-prevalence (e.g., Western) countries (Lok And McMahon, 2007; Hoofnagle et al., 2007). HBsAg seroconversion and slower disease progression are more frequent in patients with genotype B than in patients with genotype C (Kao et al., 2000).

Transmission of HBV infection, hepatitis B virus is present in the blood, saliva, semen, vaginal secretions, menstrual blood and to lesser extent, perspiration, breast milk, tears and urine of infected individuals. A highly resilient virus, HBV is resistant to breakdown, can survive outside the body, and easily transmitted through contact with infected body fluids (Lavanchy, 2004).

Hepatocellular carcinoma (HCC) is a common cancer all over the world. In Pakistan it has an incidence of 8/100,000 per annum (Jafri et al., 2006; Mujeeb et al., 1997). In Pakistan, the prevalence of Hepatitis B infection was found to be 4% and 10% among the general population in selected parts of the country (Luby et al., 1997; Malik et al., 1987). The objective of this study was to compare the safety and efficacy of current treatment options available in market which are the clinical effects and comparison of adefovir dipivoxil and lamivudine regimen in the management of chronic hepatitis B and the clinical effects and comparison of peg interferon alfa 2a with interferon alfa 2a regimen in the initial treatment of patients with chronic hepatitis C.

MATERIAL AND METHOD

Patient selection: Written consent was obtained from each patient before starting this study. The patient of HBV already taking adefovir dipivoxil and lamivudine was selected in this study and their biochemical parameter (ALT) was monitored three month as a part of this study. Similarly, the patient of HCV was monitored for their biochemical response (TLC, DLC, Hb, ALT, and Platelet count) were monitored after the initiation of treatment from 02, 04, 08, 12, 16, 20 and 24 weeks. These patients were regularly visited to their consultant physicians for routine checkup. This study was conducted from October 2007 to June 2009. In this study, HBV patients that fulfill following parameters; HbsAg Positive > six month, HbeAg positive or Negative, HBV DNA detectable ALT 2ULN, Anti HCV positive > six month, ALT > Normal, HCV RNA detectable were included.

RESULTS AND DISCUSSION

The objective of this study was comparison between current treatment available in the market for the management of hepatitis B and hepatitis C and results are shown in Table 1. In this study, 33 HCV and 40 HBV patients were selected randomly from Faisalabad, Jhang and Sargodha Districts, Punjab, Pakistan. Among 33 HCV patients, 17(51.5%) were male and 16(48.5%) were female. Similar studies have been conducted previously such as Hayashi et al. (1998) reported that the male are more prone towards the attack of HCV compared to the female, the ratio of male was 64% and that of female was 36%. In another study, the ratios of male and female ratios were 90% and 10% (Braga et al., 2006). High prevalence of HCV in female in Pakistan may be due to illiteracy and non preventable behavior of female. Among 33 HCV patients, 24(72.7%) were married and 9(27.3%) were single. Out of 33, HCV patients 13(39.39%) ages were 20-30 years, 8(24.24%) were in the range of 31-40 years and 12(36.36%) were above 40 and the mean age of all the patients was 37.67 years, in earlier study, patients infected with HCV showed the mean age of 47.57 year (Sherman et al., 2002). In another study, among patients infected with HCV the mean age was 44.6±10 (Briani, 2003). Most people infected with HCV in Korea were older than 40 years also and therefore, the surveillance of adult’s ≥40 years is expected (Hai-Rim Shin, 2006). However, in Pakistan, the prevalence of HCV is recorded in people below 40 years.

Out of 33 HCV patients, 14(42.42%) were underwent to surgery and resulantly HCV virus and 5(15%) received blood transfusion and blood transfusion is one of the disease transmission route, it might be possible that due the screening kits, the blood was not properly screened out and the patient got HCV virus. A 5(15%) of HCV patients were protected themselves from HBV with the help of HBV vaccination and 27.2% HCV subjects does not go any surgical procedure i.e. surgery, blood transfusion, tattooing, HBV vaccination etc and they got HCV from unknown sources. Out of 33 HCV patients 7(51.5%) were diabetic, most of the patients thought that they got HCV virus after diabetes, in diabetic patients immunity got weekend that provide favorable environment to any pathogens and remaining 8(41.5%) were hypertensive and 11(33.33%) were suffered from jaundice.

The prevalence of genotype 3a among in 33 HCV patients was 25 (75.7%), the prevalence of the genotype 3b was 4 (12.12%), 2a were 2 (6%) and 1a were 2 (6%). In another study, among HCV and HIV patients the genotype was 1 and genotype 2 were important (Sherman et al., 2002). Similarly, among HCV and HIV genotype was 1, 2, 3 and 5 has been also reported (carrat et al., 2004) and Braga et al. (2006) also mentioned 2 and 3 genotype. In study, 57.6% patients with
genotype 1, 39.6% with genotype 3, 2.5% with genotype 2 and 0.35% with genotype 4 were indentified (Vigani et al., 2008).

To evaluate the response of peg interferon alfa-2a with those of a regimen of interferon alfa-2a in the initial treatment of patients with chronic hepatitis C, 15 patients with chronic hepatitis C were assigned to receive either 180 µg peg interferon alfa-2a subcutaneously once/week for 24 to 48 weeks or 3 MU (million units) three times/week for 24 weeks (22 patients). All the patients were assessed at 24 to 48 weeks with average 36 week for a sustained virological response. This sustained virological response defined as an undetectable level of hepatitis C virus RNA (<100 copies per milliliter). Out of 29 HBV patients, 20 (68.96%) were male and 9 (31%) were female. Among lamivudine groups, 19 (65.5%) were male and 7 (24.24%) were female. Similar studies were conducted previously by Liaw et al. (2004) and found that the ratio of HBV positive in male was 85% and in female it was 15%. In another study, the ratio of 52% and 48% has been reported in male and female, respectively (Jafri et al., 2006). Abdo et al. (2006) reported 72% and 28% ratio among male and female, respectively. Out of total 29 HBV patients, 19 (65.5%) were married and 10 (34.5%) were single. Similar, the mean age of the HBV patients has been 47 years (Abdo et al., 2006). Out of 29 HBV patients, 5 (17.2%), 5 (17.2%) and 9 (31%) showed diabetic, hypertensive and jaundice during study. To evaluate the antiviral efficacy of lamivudine and adefovir dipivoxil in chronic hepatitis B patients, 35 treatment-naive HBeAg positive patients adults with chronic hepatitis B, 15 patients with chronic hepatitis B received lamivudine 100 mg orally once daily for 24 to 48 weeks and 25 patients received adefovir dipivoxil 10 mg orally once daily for 24 to 48 weeks. Among lamivudine groups, 12 out of 15 patients were assessed at mean 28 week and 3 patients were dropped and among adefovir dipivoxil group, 21 out of 25 patients completed treatment and 7 completed follow-up. The response of adefovir dipivoxil associated with a higher rate of HBV DNA reduction with those of a regimen of lamivudine in the management of patients with chronic hepatitis B (72.7% versus 62.5%). In another study, among HBV patients, adefovir dipivoxil showed undetectable HBV DNA up to 51% (Stephanos et al., 2003) and 12% (Chan et al.,

### Table 1: Data showing the current treatment available in the market for the management of hepatitis B and hepatitis C

<table>
<thead>
<tr>
<th>weeks</th>
<th>Interferon</th>
<th>Peginterferon</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Responder</td>
<td>Non responder</td>
</tr>
<tr>
<td>12w</td>
<td>8 (36.36)</td>
<td>4 (18.18)</td>
</tr>
<tr>
<td>16w</td>
<td>5 (22.72)</td>
<td>2 (9.09)</td>
</tr>
<tr>
<td>24w</td>
<td>9 (40.90)</td>
<td>3 (13.63)</td>
</tr>
<tr>
<td>Rate</td>
<td>(68.18%)</td>
<td>7 (31.82%)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>weeks</th>
<th>Adefovir dipivoxil</th>
<th>Lamivudine</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Responder</td>
<td>Non responder</td>
</tr>
<tr>
<td>48w</td>
<td>11 (73.33%)</td>
<td>4 (26.66%)</td>
</tr>
</tbody>
</table>

w = week (sampling duration)

All the patients of both groups faced similar symptoms such as fever, flu, fatigue, loss of appetite and persisted throughout the therapy. Among total 29 HBV patients, 22 (75.86%) were male and 7 (24.24%) were female. Similar studies were conducted previously by Liaw et al. (2004) and found that the ratio of HBV positive in male was 85% and in female it was 15%. In another study, the ratio of 52% and 48% has been reported in male and female, respectively (Jafri et al., 2006). Abdo et al. (2006) reported 72% and 28% ratio among male and female, respectively. Out of total 29 HBV patients, 19 (65.5%) were married and 10 (34.5%) were single. Similar, the mean age of the HBV patients has been 47 years (Abdo et al., 2006). Out of 29 HBV patients, 5 (17.2%), 5 (17.2%) and 9 (31%) showed diabetic, hypertensive and jaundice during study. To evaluate the antiviral efficacy of lamivudine and adefovir dipivoxil in chronic hepatitis B patients, 35 treatment-naive HBeAg positive patients adults with chronic hepatitis B, 15 patients with chronic hepatitis B received lamivudine 100 mg orally once daily for 24 to 48 weeks and 25 patients received adefovir dipivoxil 10 mg orally once daily for 24 to 48 weeks. Among lamivudine groups, 12 out of 15 patients were assessed at mean 28 week and 3 patients were dropped and among adefovir dipivoxil group, 21 out of 25 patients completed treatment and 7 completed follow-up. The response of adefovir dipivoxil associated with a higher rate of HBV DNA reduction with those of a regimen of lamivudine in the management of patients with chronic hepatitis B (72.7% versus 62.5%). In another study, among HBV patients, adefovir dipivoxil showed undetectable HBV DNA up to 51% (Stephanos et al., 2003) and 12% (Chan et al.,
The side effects of treatment were upper respiratory symptoms, headache, back pain and diarrhea in all patients.

CONCLUSION

Peg interferon alfa-2a was found more potent as it was associated with a higher rate of virological response versus interferon alfa-2a at 24th week (72.7% versus 68.18%). Sustained normalization of serum alanine aminotransferase concentrations at 24th week was also more common in the peg interferon group than interferon group (51% versus 31%). The response of adefovir dipivoxil associated with a higher rate of HBV DNA reduction versus lamivudine regimen in the management of patients with chronic hepatitis B (72.7% versus 62.5%). From results of present study, it is concluded that there is a need to select proper anti-hepatitis for the treatment of hepatitis patients.

REFERENCE


antibodies in hepatocellular carcinoma cases in Karachi, Pakistan. Trop Doct. 27(1), 45-46.