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BRIEF ARTICLE

Testing for hepatitis B infection in prospective chemotherapy patients: A retrospective study

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Abstract

AIM: To estimate hepatitis B virus (HBV) infection testing rate in cancer patients before chemotherapy with a focus on HBV reactivation.

METHODS: A retrospective study was conducted from January 1, 2009 to June 30, 2010. Inclusion required that patients be naïve to cancer chemotherapy but have indications for it. Patients who did not receive chemotherapy for any reason were excluded. Important clinical information, such as the levels of HBV DNA and serological markers were collected. HBV reactivation was defined as an increase in serum HBV DNA to > 1 log higher than that of the pre-exacerbation baseline, or serum HBV DNA conversion from negative to positive. HBV DNA levels > 1000 copies/mL were defined as HBV DNA positive. The χ^2 or Fisher's exact test was used for analysis of categorized data. Multiple logistic regression analysis was used to estimate the odd ratio and 95%CI of the HBV screening rate.

RESULTS: Of 6646 patients, 5616 (84.5%) received chemotherapy. Only 17.1% of the cancer patients received pre-chemotherapy HBV testing (43.2% for hematological malignancies and 14.9% for solid tumors). Patients who had received rituximab therapy, had elevated aminotransferase levels, or had hematological malignancies were more likely to receive HBV testing. The prevalence of hepatitis B surface antigen (HBsAg) positivity was 13.4%. HBV reactivation (appearance of HBV DNA or an increase in HBV DNA levels by 1 $\log_{10}$) was observed in 33.1% (53/160) of the patients after chemotherapy. Among patients without prophylactic antiviral therapy, the reactivation rate was 43.9% (43/98) in the solid tumor group. Two reactivation cases occurred in patients who were HBsAg negative, but positive for hepatitis B core antibody. HBV reactivation was more likely to occur in patients with lymphoma, high levels of HBV DNA, or hepatitis B e antigen, and in men.

CONCLUSION: Less than 20% of patients received HBV testing before chemotherapy. HBV reactivation would have occurred in about 50% of infected patients with solid tumors without antiviral prophylaxis.

Key words: Chemotherapy; Hematologic malignancy; Hepatitis B virus; Hepatitis B virus reactivation; Solid tumor

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INTRODUCTION

Hepatitis B virus (HBV) infection is a global health problem. According to estimates of the World Health Organization, nearly 2 billion people worldwide have been infected with HBV, and > 350 million have chronic infection[1]. Hepatitis B is endemic in China, and the weighted prevalence of hepatitis B surface antigen (HBsAg) for the Chinese population is 7.2%[2]. Cancer patients receiving intensive chemotherapy may be at risk for HBV reactivation[3-8]. A previous study has reported that the reactivation rate of HBV infection after chemotherapy was as high as 73%[8]. It has been observed in a meta-analysis that the average reactivation rate of HBV infection was nearly 34% (162/475 patients), and the mortality rate was about 7% (27/394 patients)[9]. HBV reactivation might lead to a delay in chemotherapy, therefore, antiviral therapy should be administered immediately[3]. However, this might affect the efficacy of chemotherapy.

Corticosteroids, monoclonal antibodies (such as rituximab and alemtuzumab), and nearly all types of chemotherapeutic agents have been involved in HBV reactivation[5]. A diagnosis of lymphoma is another risk factor for HBV reactivation[4]. A multivariate analysis has revealed that patients with lymphoma or breast cancer are more likely to develop HBV reactivation after chemotherapy[10].

Recently, more attention has been paid to HBV testing before chemotherapy. Many clinical practice guidelines, such as the associated guidelines of the European Association for the Study of Liver Disease (EASL) and the American Association for the Study of Liver Diseases, advise HBV testing before starting chemotherapy[11,12]. The United States Centers for Disease Control and Prevention (CDC) also recommend testing for chronic HBV infection in cancer patients receiving chemotherapy[13]. It has been reported in recent years that the HBV infection testing rates before chemotherapy in Canada and the United States were 14%[14] and 16.7%[15], respectively. However, to the best of our knowledge, few studies have focused on this issue in a high endemic region of HBV infection such as China.

The aim of this study was to assess the rate of HBV serological testing prior to initiation of chemotherapy and the rate of HBV reactivation after chemotherapy in cancer patients in China.

MATERIALS AND METHODS

Patients

From January 1, 2009 to June 30, 2010, all cancer patients who were seen in the Cancer Center of West China Hospital were analyzed. Inclusion in this study required that patients be naïve to cancer chemotherapy but have indications for it. Patients who did not receive chemotherapy for any reason were excluded. This study was approved by the Institutional Review Board of West China Hospital and carried out according to the provisions of the Helsinki Declaration.

Methods and definitions

A retrospective study of the chart information on cancer patients was undertaken. HBV reactivation was defined as an increase in serum HBV DNA to > 1 log higher than that of the pre-exacerbation baseline, or serum HBV DNA conversion from negative to positive[16]. In our center, HBV DNA levels > 1000 copies/mL were defined as HBV DNA positive. Important clinical information, such as the levels of HBV DNA and serological markers [including HBsAg, hepatitis B surface antibody (anti-HBs), hepatitis B e antigen (HBeAg), HBeAg antibody and hepatitis B core antibody (anti-HBc)], were collected and measured by a microparticle enzyme-linked immunosorbent assay (Santa Cruz Biotechnology, CA, United States). All hepatitis B serological marker results were reported as positive or negative. EASL guidelines recommend that all patients requiring chemotherapy be tested for HBsAg and anti-HBc prior to initiation of treatment[11], therefore, the presence of either HBsAg-positive or isolated anti-HBc-positive results was defined as positivity for an HBV serological marker (HBV-sm). HBV DNA levels were tested using a real-time polymerase chain reaction detection system (Applied Biosystems, Foster City, CA, United States). Individuals with chronically elevated alanine aminotransferase (ALT) or aspartate aminotransferase (AST) should be routinely tested for HBV[12], and ALT and AST levels were analyzed using an automatic biochemistry analyzer (Olympus AU5400, Olympus Corporation, Tokyo, Japan). Values for ALT or AST above the upper limit of normal (58 IU/L in our hospital) were defined as elevated.

Statistical analysis

Frequencies and percentages were used for statistical descriptions. The χ^2 or Fisher's exact test was used for analysis of categorized data. A nonparametric Mann-Whitney/Wilcoxon test or *t* test was used for analysis of quantitative data. Multiple logistic regression analysis was used to estimate the odd ratio (OR) and 95%CI of the HBV screening rate. All statistical analyses were carried out using SPSS version 18.0 statistical software, and statistical significance was defined as $P < 0.05$.

RESULTS

Patient characteristics

From the beginning of January 2009 to the end of June 2010, a total of 6646 cancer patients were reviewed. Among these patients, 5616 (84.5%) received chemotherapy (Figure 1). Combined with other chemotherapeutic agents, rituximab was given to 49 patients (17.4%) and/or steroids were given to 203 (72.2%) patients with hematological malignancies. Patient characteristics are shown in Table 1.

Testing for HBV infection

As shown in Figure 1, 49.3% (2770/5616) patients were screened for HBV before initiation of chemotherapy.

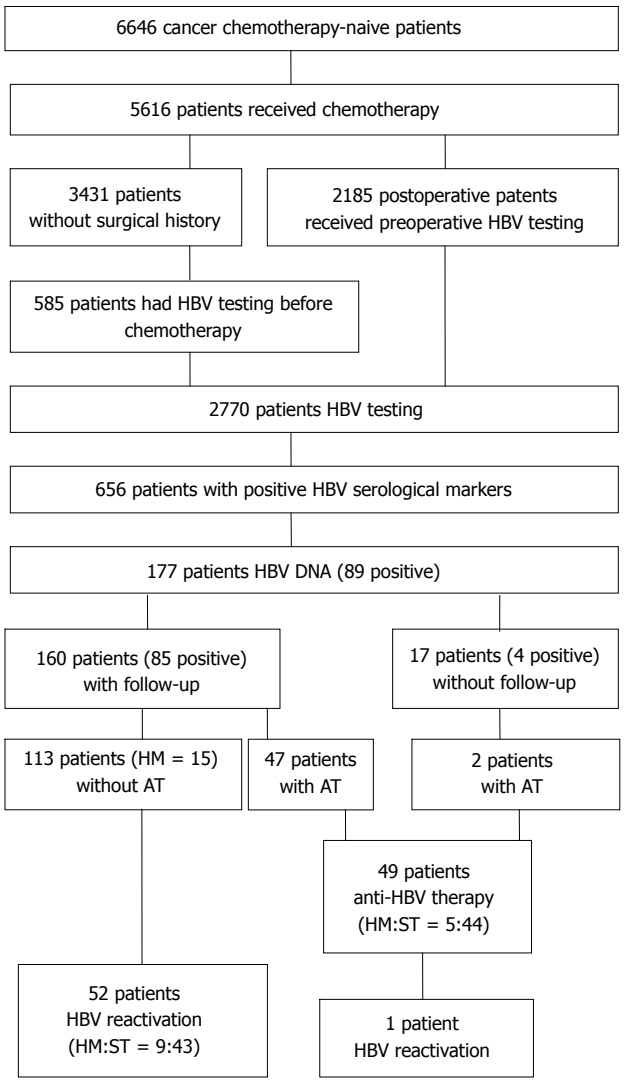

Figure 1 Study flow diagram. HM: Hematological malignancy; ST: Solid tumor; AT: Anti-HBV therapy; HBV: Hepatitis B virus.

The testing rate for patients with hematologic malignancies and solid tumors was 47.7% (134/281) and 49.4% (2636/5335), respectively. However, the reason for HBV serological testing in 2185 patients was not in preparation for chemotherapy, but as a routine check before surgery. Only 17.1% (585/3431) of the cancer patients received pre-chemotherapy HBV testing. The exact pre-chemotherapy testing rate for hematological malignancies and solid tumors was 43.2% (112/259) and 14.9% (473/3172), respectively. As shown in Table 2, in univariate analysis, the characteristics of age > 50 years, male sex, history of HBV infection, rituximab use, elevated aminotransferases, and hematological malignancies were associated with HBV testing. In multiple logistic regression analysis, patients with rituximab therapy (OR: 1.96, 95%CI: 1.04-3.67, $P < 0.05$), elevated aminotransferase levels (OR: 10.88, 95%CI: 8.01-14.78, $P < 0.001$), and hematological malignancies (OR: 4.17, 95%CI: 3.10-5.61, $P < 0.001$) were more likely to have received pre-chemotherapy HBV serological testing.

Table 1 Characteristics of 5616 cancer patients who received chemotherapy *n* (%)

Characteristics	Hematological malignancy	Solid tumor		Total
	(*n* = 281)	HCC (*n* = 237)	Others (*n* = 5098)	(*n* = 5616)
Age (yr), mean (range)	50.5 (18-83)	53.1 (39-67)	54.4 (41-67)	54.1 (29-79)
Sex				
Men	176 (62.6)	201 (84.8)	2567 (50.4)	2944 (52.4)
Women	105 (37.4)	36 (17.9)	2531 (49.6)	2672 (47.6)
Surgical history	22 (7.8)	6 (2.5)	2157 (42.3)	2185 (38.9)
History of HBV infection[1]	27 (9.6)	126 (53.2)	179 (3.5)	332 (5.9)
Aminotransferase				
Normal (< 58 IU/mL)	251 (89.3)	144 (60.8)	4816 (94.5)	5211 (92.8)
Elevated	30 (10.7)	93 (39.2)	282 (5.5)	405 (7.2)

[1]History of hepatitis B surface antigen positivity. HCC: Hepatocellular carcinoma; HBV: Hepatitis B virus.

Table 2 Univariate logistic regression analysis of factors associated with testing for hepatitis B virus serological markers prior to chemotherapy, but excluding those tested preoperatively (*n* = 3431)

	No.	Screening *n* (%)	*P* value
Age (yr)			< 0.01
≤ 50	1215	240 (19.8)	
> 50	2216	345 (15.6)	
Sex			< 0.05
Men	2031	374 (18.4)	
Women	1400	211 (15.1)	
Rituximab therapy[a]			< 0.01
Yes	49	25 (51.0)	
No	3382	560 (16.6)	
History of HBV infection			< 0.01
Yes	141	45 (31.9)	
No	3290	540 (16.4)	
ALT and/or AST[b]			< 0.01
Abnormal	205	128 (62.4)	
Normal	3226	457 (14.2)	
Types of tumor[c]			< 0.01
Hematological	259	112 (43.2)	
Solid	3172	473 (14.9)	< 0.05
Liver cancer	78	18 (23.1)	
Others	3094	455 (14.7)	

[a]$P = 0.038$ (OR: 1.96, 95%CI: 1.04-3.67); [b]$P < 0.001$ (OR: 10.88, 95%CI: 8.01-14.78); [c]$P < 0.001$ (OR: 4.17, 95%CI: 3.10-5.61). OR: Odds ratio; HBV: Hepatitis B virus; ALT: Alanine aminotransferase; AST: Aspartate aminotransferase.

HBV serological markers

The prevalence of HBsAg positivity was 13.4%. The prevalence of HBV-sm positivity was 23.7%. The prevalence of HBsAg positivity ($P < 0.001$) and HBsAg and/or anti-HBc positivity ($P < 0.001$) in the male patients were significantly higher than in the female patients. In patients < 20 years old, the rate of HBV-sm positivity was significantly lower than in patients in the older age group ($P < 0.001$) (Table 3).

Table 3 Prevalence of hepatitis B virus serum markers and DNA in 2770 patients *n* (%)

	No.	HBsAg+	HBsAb+	HBeAg+	HBeAb+	Isolated HBcAb+	HBV-sm positive[1]	Screening HBV DNA[2]
Total	2770	372 (13.4)	1367 (49.4)	43 (1.6)	600 (21.7)	284 (10.3)	656 (23.7)	177 (27.0)
Age (yr)								
≤ 20	27	2 (7.4)	14 (51.9)	1 (3.7)	2 (7.4)	1 (3.7)	3 (11.1)	1 (33.3)
>20	2743	370 (13.5)	1353 (49.3)	42 (1.5)	598 (21.8)	283 (10.3)	653 (23.8)	176 (27.0)
Sex								
Women	1495	144 (9.6)	780 (52.2)	15 (1.0)	280 (18.7)	146 (9.8)	290 (19.4)	52 (17.9)
Men	1275	228 (17.9)	587 (46.7)	28 (2.2)	320 (25.5)	138 (10.8)	366 (28.7)	125 (34.2)
Types of tumor								
Hematological	134	21 (15.7)	51 (38.1)	3 (2.2)	26 (19.4)	7 (5.2)	28 (20.9)	23 (82.1)
Solid	2636	351 (13.3)	1316 (49.9)	40 (1.5)	574 (21.8)	277 (10.5)	628 (23.8)	154 (24.5)
Liver cancer	177	114 (64.4)	45 (25.4)	17 (9.6)	114 (64.4)	27 (15.3)	141 (79.7)	68 (48.2)
Others	2459	207 (8.4)	1271 (41.7)	23 (0.9)	114 (64.4)	250 (10.2)	487 (19.8)	84 (3.5)

[1]HBV-sm positive: HBV serological marker positive (HBsAg positive and/or isolated HBcAb positive); [2]Percentage equals the screening number of HBV DNA/number of HBV-sm positive. HBV: Hepatitis B virus; HBsAg: Hepatitis B surface antigen; HBsAb: Hepatitis B surface antibody; HBeAg: Hepatitis B e antigen; HBeAb: Hepatitis B e antibody; HBcAb: Hepatitis B core antibody.

Table 4 Characteristics of 160 hepatitis B surface antigen-seropositive cancer patients undergoing cytotoxic chemotherapy *n* (%)

	Patients developed HBV reactivation (*n* = 53)	Patients who did not develop HBV reactivation (*n* = 107)	*P* value
Sex[a]			< 0.05
Men	43 (38.4)	69 (61.6)	
Women	10 (20.8)	38 (79.2)	
Age (yr), median (range)	51.5 (24.8-78.2)	52.9 (27.8-77.9)	
Tumor type[b]			< 0.05
Lymphomas	10 (55.6)	8 (44.4)	
Solid tumor	43 (30.3)	99 (69.7)	
Liver cancer	25 (35.7)	45 (64.3)	
Others	18 (25.0)	54 (75.0)	
ALT levels, median (range) (normal < 58 IU/mL)	69.1 (21.9-116.3)	55.7 (18.2-93.2)	
HBeAg status[c]			< 0.01
Positive	17 (73.9)	6 (26.1)	
Negative	36 (26.3)	101 (73.7)	
HBV DNA status[d]			< 0.01
Positive	47 (45.2)	57 (54.8)	
Negative	6 (10.7)	50 (89.3)	
Use of rituximab			< 0.05
Yes	6 (60)	4 (40)	
No	47 (31.3)	103 (68.7)	
Use of corticosteroids			< 0.05
Yes	8 (61.5)	5 (38.5)	
No	45 (30.6)	102 (69.4)	
Receiving antiviral therapy			< 0.01
Yes	1 (2.1)	46 (97.9)	
No	52 (46.0)	61 (54.0)	

[a]*P* = 0.040 (OR: 2.634, 95%CI: 1.046-6.63); [b]*P* = 0.002 (OR: 5.700, 95%CI: 1.869-17.380); [c]*P* = 0.000 (OR: 6.064, 95%CI: 2.213-16.621); [d]*P* = 0.006 (OR: 5.982, 95%CI: 1.689-21.194). OR: Odds ratio; HBV: Hepatitis B virus; ALT: Alanine aminotransferase; HBeAg: Hepatitis B e antigen.

HBV DNA and antiviral therapy

Among the 656 patients who were positive for HBV serological markers, 177 (27.0%) received HBV DNA testing and 160 (24.4%) underwent re-examination. The HBV DNA testing rate was significantly higher in the hematological cancer group ($P < 0.001$). Antiviral therapy (lamivudine) was given to 55.1% (49/89) of the patients who were positive for HBV DNA. All five HBV-DNA-positive patients with hematological malignancies received antiviral therapy, but only 52.4% (44/84) of the HBV-DNA-positive patients with solid tumors were given antiviral therapy (Figure 1 and Table 3).

HBV reactivation

Two cases of reactivation occurred in HBsAg-negative but anti-HBc-positive patients. One patient had diffuse large B-cell lymphoma while the other had breast cancer. As shown in Figure 1, HBV reactivation was observed in 33.1% (53/160) of patients after chemotherapy. Within the virus-untreated cohort ($n = 113$), the reactivation rate was 46.0% (52/113 patients). Among the 47 patients who received antiviral therapy, only one case of reactivation (2.1%) occurred. However, HBV reactivation was observed in 60.0% (9/15 patients) in the hematological malignancy group and 43.9% (43/98) in the solid tumor group who had not received any antiviral therapy. The median onset time of HBV reactivation was 11 wk (range: 3-25 wk) after initiation of chemotherapy. HBV reactivation developed earlier ($P < 0.001$) in patients with lymphoma (9 wk, range: 4-14 wk) than in those with other cancers (15 wk, range: 9-21 wk). HBV reactivation also developed earlier ($P < 0.001$) in patients receiving CHOP (cyclophosphamide, doxorubicin, vincristine and prednisolone)-like regimens (8 wk, range: 3-15 wk) compared to non-CHOP protocols. Baseline HBV status (positive or negative) was not significantly associated with the time interval between initiation of chemotherapy and onset of HBV reactivation. In multivariate analysis (Table 4), HBV reactivation was more likely to occur in patients with lymphoma, high levels of HBV DNA, HBeAg positivity, and male patients. It was also found that antiviral prophylaxis for patients who were positive for HBV DNA significantly reduced the incidence of chemotherapy-induced HBV reactivation (OR: 0.009,

95%CI: 0.001-0.073, $P < 0.001$).

Chemotherapy drugs and HBV reactivation

Of the 160 patients who were re-tested for HBV, 13 had received corticosteroids (all patients had lymphoma) and 61.5% (8/13) developed HBV reactivation. In univariate analysis, HBV reactivation was more likely to occur in patients who had received corticosteroids ($P = 0.023$) and botanical chemotherapeutic drugs ($P = 0.048$). However, the components of the chemotherapy regimens (including corticosteroids) seemed not to be associated with HBV reactivation in multivariate analysis.

Hepatitis C virus co-infection

Of 5616 patients, 2679 (47.7%) were tested for hepatitis C virus (HCV). In this group, 305 and 12 patients were HBsAg positive and HCV RNA positive, respectively. Only four out of 305 patients (1.3%) were both HBsAg and HCV-RNA positive, and none of these patients developed HBV reactivation.

DISCUSSION

In recent years, many organizations have advocated that all chemotherapy candidates should receive HBV serological testing before starting treatment[11-13]. In the present study, it was observed that 49.3% of patients had received HBV serological testing prior to chemotherapy, which was much higher than reports from Canada (14%)[14] and the United States (16.7%)[15]. However, most of the patients were not for HBV infection because of impending chemotherapy, but as part of a preoperative routine (Figure 1). Therefore, only 17.1% of the cancer patients received pre-chemotherapy HBV testing, which is close to the testing rates in other published studies[14,15].

Patients with elevated aminotransferase levels prior to chemotherapy were more likely to be screened for HBV infection (OR: 10.88, $P < 0.001$). This is reasonable because elevated aminotransferase levels usually indicate liver inflammation, which may lead physicians to screen for HBV as a possible etiology. Guidelines have recommended that individuals with chronically elevated ALT or AST should be routinely screened for HBV infection[12]. However, not all patients with elevated aminotransferases receive HBV testing. It has been reported that only 30%-70% of oncologists screen for HBV infection before chemotherapy in patients with abnormal liver-associated enzymes[17,18]. The testing rate of only 62.4% in the current study is consistent with the data from other studies. The lack of HBV testing might be because some patients without a history of HBV infection had only slightly elevated aminotransferase levels that were insufficiently high to be a contraindication for chemotherapy.

In the current study, a relationship was found between the type of tumor and the rate of HBV serological testing. Patients with hematological malignancies (OR: 4.17, $P < 0.001$) were more likely to receive HBV testing before chemotherapy. The same phenomenon was also observed in an American study[19], which might be partly because lymphoma is a known risk factor for HBV reactivation[4,10]. Rituximab is a standard treatment for diffuse large B-cell lymphoma. Rituximab treatment was found to be an important indicator associated with HBV testing prior to chemotherapy (OR: 1.96, $P = 0.038$) in the present study. Testing for HBV infection before anticancer therapy is likely because of the known risk of HBV reactivation after rituximab administration[20].

In the current study, the HBV reactivation rate was found to be 33.1%, which was very close to the average reactivation rate (34%) observed in a prior meta-analysis[9].

The median onset time of HBV reactivation after initiation of chemotherapy was 11 wk (range: 3-25 wk), which was similar to that reported previously (16 wk, range: 4-36 wk)[21]. HBV reactivation was observed to occur earlier in patients with lymphoma and those receiving CHOP-like regimens in the current study. Previous studies have identified many risk factors related to HBV reactivation during anticancer therapy, such as male sex, younger age, absence of anti-HBs, HBeAg seropositivity, diagnosis of lymphoma or breast cancer, high pre-chemotherapy HBV DNA levels, and the use of steroids or rituximab[4,10,20,22]. In addition, it has also been reported that HBV DNA contains a glucocorticoid responsive element that stimulates HBV replication[23,24]. Multivariate analysis in the present study identified high baseline levels of HBV DNA, male patients, HBeAg positivity, and lymphoma to be predictive of HBV reactivation (Table 4). Further study is needed to determine the relationship between HBV reactivation and steroids (including their dose).

HBV reactivation rates were significantly higher in the non-lamivudine group compared with the lamivudine group (46.0% *vs* 2.1%). Moreover, multivariate analysis identified that antiviral prophylaxis significantly reduced the incidence of chemotherapy-induced HBV reactivation, which has also been reported previously[25-28]. Therefore, for patients with high baseline levels of HBV DNA, prophylactic lamivudine might be considered before chemotherapy. This is already recommended by EASL and CDC[11,13]. However, high baseline HBV viral loads are associated with the development of resistance to lamivudine (an antiviral agent with a low genetic barrier)[29]. After prophylactic administration of lamivudine, the rate of HBV reactivation was 5%-13.3% in previous studies[25,27,28]. It was observed in some small studies that none of the HBsAg-positive patients receiving chemotherapy or immunosuppressive therapy developed HBV reactivation after prophylactic entecavir[30,31]. Therefore, prophylactic administration of other antiviral agents with high genetic barriers to resistance, such as entecavir or tenofovir, might be considered suitable substitutes for lamivudine for HBV prophylaxis prior to chemotherapy.

In the current study, it was observed that 372 patients (13.4%) were HBsAg seropositive (Table 3). According to an epidemiological serological survey of hepatitis B[2], the

weighted prevalence of HBsAg for the Chinese population aged 1-59 years was 7.2%. Therefore, the prevalence of HBsAg in the current study seems to be higher. This might be because most of the patients in our study were > 20 years old (Table 3), and therefore, born before the introduction of the universal vaccination program[32]. Another reason might be that our patients with a history of HBV or elevated aminotransferases were more likely to be tested for HBV infection (Table 2).

Previous studies have reported that 0.72%-3.3% of patients who were negative for HBsAg developed *de novo* HBV-related hepatitis after chemotherapy[33-35]. Therefore, it is not sufficient to test for the presence of HBsAg alone as a marker of HBV infection. This is consistent with the EASL recommendations that cancer patients should be tested for both HBsAg and anti-HBc before chemotherapy[11]. In the current study, 284 patients (10.5%) were HBsAg negative but anti-HBc positive (Table 3), and two of these had HBV reactivation; one with diffuse large-B lymphoma and the other with breast cancer.

As mentioned before, high baseline HBV DNA levels are an independent risk factor for HBV reactivation[10,22]. EASL has recommended that cancer patients who are HBsAg or anti-HBc positive should have their HBV DNA levels measured[11]. In the current study, of the 656 patients who were HBsAg positive and/or anti-HBc positive, only 177 patients (27.0%) had been tested for HBV DNA (Table 3). Oncology physicians should pay more attention to this problem.

A high prevalence of occult HBV infection has been observed in HCV-infected patients[36,37]. The HCV co-infection rate among HBsAg carriers ranged from 3% to 18%[38,39], depending on the geographic location and selection of patients. In the current study, 4 patients (1.3%) were positive for both HBsAg and HCV RNA, and none developed HBV reactivation. This might have been because HCV replication is suspected to suppress HBV replication strongly[40].

The limitations of this study include the fact that it was a single-institution, retrospective study. Some important information was not recorded, such as the reasons why physicians made decisions regarding testing for HBV infection. This limitation may be resolved by a prospective study in the future.

In conclusion, only 17.1% of cancer patients received complete HBV testing prior to chemotherapy. Patients who were to receive rituximab therapy, had elevated aminotransferase levels, or had hematological malignancies were more likely to receive HBV testing. Only 27% of the patients who were positive for HBsAg and/or anti-HBc received testing for HBV DNA. HBV reactivation was observed in 33.1% of the patients, and was more likely to occur in patients with lymphoma, high levels of HBV DNA, HBeAg positivity, and male patients. Prophylactic antiviral therapy for patients with positive HBV DNA can significantly reduce the incidence of chemotherapy-induced HBV reactivation.

COMMENTS

Background

Cancer patients receiving intensive chemotherapy may be at risk for hepatitis B virus (HBV) reactivation. Recently, more attention has been paid to HBV testing before chemotherapy. Many clinical practice guidelines advise HBV testing before starting chemotherapy. However, few studies have focused on this issue in regions of high HBV endemicity, such as China.

Research frontiers

Authors demonstrated that only 17.1% of cancer patients received pre-chemotherapy HBV testing (43.2% for hematological malignancies and 14.9% for solid tumors). Patients who had received rituximab therapy, had elevated aminotransferase levels, or had hematological malignancies were more likely to receive HBV testing. HBV reactivation was more likely to occur in patients with lymphoma, high levels of HBV DNA, hepatitis B e antigen positivity, and male patients.

Innovations and breakthroughs

In recent years, more organizations have advocated that all chemotherapy candidates should receive HBV serological testing before starting treatment. This is believed to be the first study to report the exact pre-chemotherapy HBV testing rate in China; a region of high endemicity for HBV infection. The rate of HBV reactivation after chemotherapy and the median onset time are also reported.

Applications

Many clinical practice guidelines advise HBV testing before starting chemotherapy. However, the results in this study showed that only 17.1% of cancer patients received pre-chemotherapy HBV testing.

Terminology

HBV reactivation was defined as an increase in serum HBV DNA to > 1 log higher than that of the pre-exacerbation baseline, or serum HBV DNA conversion from negative to positive.

Peer review

In this retrospective analysis, the authors assessed the rate of HBV serological testing prior to the initiation of chemotherapy and the rate of HBV reactivation after chemotherapy in Chinese patients with cancer. The authors concluded that < 20% of patients received HBV testing before chemotherapy, and HBV reactivation would have occurred after chemotherapy in nearly half of these infected patients who did not receive pre-emptive antiviral therapy.

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