Réseau de cancérologie Rossy | Rossy Cancer Network

Hepatitis B Virus (HBV) Screening and Associated Outcomes in Malignant Hematology Patients Receiving Rituximab Therapy within the Rossy Cancer Network

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INTRODUCTION

Rituximab is a monoclonal antibody (anti-CD20) used widely in the treatment of B cell malignancies. Therapy with Rituximab is associated with an increased risk of reactivation of HBV and subsequent hepatitis, liver failure and death (Loomba 2017).

The American Society of Clinical Oncology (ASCO) recommends that all patients who will receive rituximab containing chemotherapy be screened for hepatitis B surface antigen (HBsAg) and antibody against hepatitis B core protein (anti-HBc) (Hwang 2015) .

According to ASCO, the rates of screening for non-Hodgkin's lymphoma patients before the administration of rituximab were less than 70% in 2014 for US centers participating in ASCO's Quality Oncology Practice Initiative.

OBJECTIVES

Within the Rossy Cancer Network (RCN), a previous study at the McGill University Hospital Centre (MUHC), one of three McGill partner hospitals of the RCN, found that about one third of the patients receiving rituximab were inadequately screened (Lawandi 2015). In addition, not all patients who were found to be at risk were appropriately monitored or given prophylaxis.

Our current study measures the rate of appropriate screening, monitoring and prophylaxis of hepatitis B virus within the three RCN partner hospitals (MUHC, Jewish General Hospital (JGH), St-Mary's Hospital Center (SMHC)) among patients with hematologic malignancies prior to receiving rituximab.

METHODS / INTERVENTIONS

Patient selection

- Patients who received rituximab between April 1st 2014 to March 31st, 2016 were included
- Inclusion criteria:
  - Rituximab must have been used as part of a therapy for a hematologic malignancy
  - First cycle of the treatment regimen containing rituximab must have been started within the recruitment time frame; Patient who received prior rituximab treatments (not part of current regimen) were also included

Hepatitis B Screening Practices

- Available hepatitis B screening tests were recorded (anti-HBc, anti-HBs, and HBsAg)
- For patients with positive anti-HBc and/or HBsAg, HBV-DNA monitoring and prophylactic agent used (number of months used) were recorded
- ALT level were recorded for patients with positive anti-HBc and/or HBsAg. And transaminitis was defined as ALT ≥ 38IU/mL for woman and ALT ≥ 60 IU/mL for men (Terrault 2016)
- Appropriate screening was defined as screening for both anti-HBc and HBsAg within 6 months prior to initiation of rituximab
- Appropriate HBV-DNA monitoring timeline was defined as every 3 months until at least >6 months post last dose of rituximab.

RESULTS

Appropriate HBV screening rates prior to rituximab for patients with hematologic malignancies were the highest at the MUHC with a rate of 59%, followed by the JGH at 43% and the SMHC at 2%.

Appropriate screening is defined as done at any point during the 6-month period before rituximab therapy, for both anti-HBc and HBsAg. Any screening done outside this time frame, or if only one of the two tests were done, then they are termed "suboptimal".

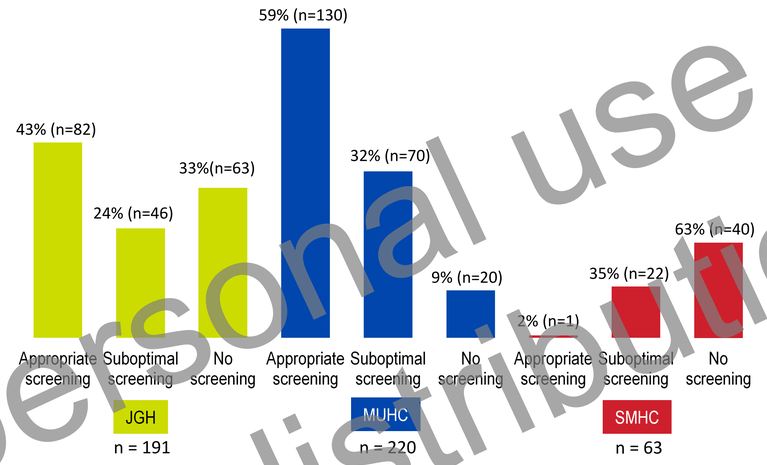

Figure 1. HBV screening practices according to appropriateness and to site.

Table 1. HBV screening according to tests used (Anti-HBc, HBsAg, and Anti-HBs) and to site

Appropriate screening	JGH N = 191	MUHC N = 220	SMHC N = 63	RCN N = 473
Anti-HBc, n (%)	82 (43)	135 (61)	1 (2)	218 (46)
HBsAg, n (%)	82 (43)	151 (69)	15 (24)	248 (52)
Anti-HBs, n (%)	42 (22)	149 (68)	15 (24)	206 (44)

All patients who were anti-HBc+ were also screened for HBsAg. There were in total 6 patients who were anti-HBc+/HBsAg+; among them, 4 were appropriately screened and 2 sub-optimally screened. 41 patients were anti-HBc+/HBsAg- among whom 28 were appropriately screened and 13 sub-optimally screened (included in this group is one patient with a borderline anti-HBc value). Among the 251 patient that were anti-HBc-/HBsAg-, there were 181 who were appropriately screened and 73 who were sub-optimally screened.

There were 13 patients who had only anti-HBc screening and 39 patients who had only HBsAg screening. The screening results for these 2 groups were all negative.

There were 123 patients who had no screening. One patient who had only HBsAg screening had no accessible result.

Table 2. Prophylaxis practices and HBV DNA monitoring among anti-HBc+ and HBsAg+ patients

		Anti-HBc+ / HBsAg+		Anti-HBc+ / HBsAg-	
	Hospital	JGH	MUHC	JGH	MUHC
	n	2	4	16	25
Prophylaxis	Received	2	4	2	15
	Did not receive	0	0	13	10
	Unknown	0	0	1	0
HBV DNA monitoring	Appropriate	0	0	0	1
	Inappropriate	0	0	14	9
	Not applicable, received prophylaxis	2	4	2	15
Number (%) of patients who received neither prophylaxis nor appropriate monitoring		0 (0%)	0 (0%)	14 (87%)	9 (36%)

Table 3. Transaminitis outcomes among patients with positive result and among patients who were not screened.

	Anti-HBc+ / HBsAg+	Anti-HBc+ / HBsAg-	Never screened	Total N
n	6	41	123	170
Transaminitis, no. (%)	3 (50%)	15 (37%)	32 (26%)	50 (29%)

Two known cases of HBV reactivation occurred among the studied population. One being the index patient that prompted the initial study at MUHC, the second at JGH who had raising HBV DNA levels while on prophylaxis.

CONCLUSION

Appropriate HBV screening rates prior to rituximab for patients with hematologic malignancies are low within the RCN partner hospitals. The variation in appropriate screening illustrates differences in practice across the three sites. At the JGH, when screening is done, the laboratory performs systematic testing for both anti-HBc and HBsAg. The MUHC orders these tests separately. At SMHC, only HBsAg is done. Furthermore, the rates of appropriate HBV DNA monitoring and appropriate prophylaxis are low.

The results of this study identify suboptimal practices and potential targets for quality improvement initiatives. We propose the following changes to achieve higher percentage of appropriate screening:

- Develop local guidelines based on existing literature and input from clinicians to standardize practice across the RCN hospitals.
- Implement systemic changes such as having the pharmacy clear HBV screening status prior to delivering rituximab (although it will need to be clarified that HBV status only need to be screened prior to first cycle of rituximab)
- Create standardized laboratory requests to systematically include both anti-HBc and HBsAg when HBV screening is required.

Having seen that over 50% of SMHC patients did not obtain HBV screening, the oncology lead implemented standardized screening for HBV (anti-HBc, anti-HBs, and HBsAg), HCV, and HIV in all new patients undergoing blood work.

A follow up study will be done to assess the impact of the above quality improvement changes on the rate of appropriate HBV screening.

For questions, contact: shen.li2@mail.mcgill.ca

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