Correlation between Hepatitis B virus core related antigens (HbcrAg) and HBV-DNA in HBV infection monitoring: a preliminary study

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Background:

Hepatitis B virus (HBV) infection is a global health problem, affecting approximately 400 million patients worldwide.
Countries that implement early universal vaccination have experienced a decrease in acute hepatitis B in adults and in Hepatocellular Carcinoma (HCC) in children.
In order to diagnose and classify HBV infection a combination of biochemical, serological, virological tests and histological features are used. Both HBV antigens (HBsAg and HBeAg) and antibodies (anti-HBs, anti-HBc and anti-HBe), are widely available and standardised. Serum HBV-DNA quantification is currently based on a PCR method. Positive HBV-DNA results by more sensitive PCR assays may be found in HBsAg positive individuals who were previously considered inactive HBsAg carriers. Diagnosis relies on the demonstration of HBsAg or HBV-DNA in serum.
A potentially useful, novel marker is the hepatitis B core-related antigen (HbcrAg) that detects an aminoacid sequence shared by HBeAg and the hepatitis B core protein. Recently, HBcrAg levels were strongly associated with the development of HCC. HBcrAg has also been suggested to be a marker of HBV reinfection after liver transplantation.
HBV biomarkers monitoring is used to evaluate progression of liver disease, the need for treatment and the response to therapy. The major issue is the value of serum HBV-DNA quantification to assess response to antiviral therapy.
The aim of this study was to evaluate the correlation between HBV-DNA and HBcrAg levels in serum.

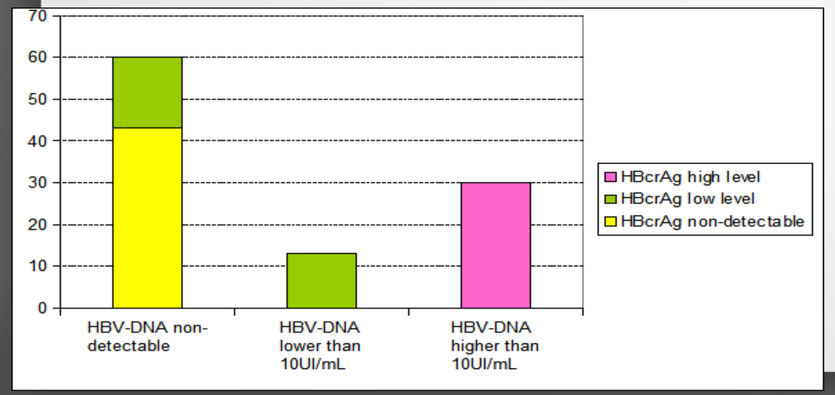
Material/methods:

Over the period march-november 2016, 178 serum samples of HBV infected patients were tested to evaluate HBcrAg levels.
Quantitative levels of HBV core-related antigen (HBcrAg) were determined using the Lumipulse® G HBcrAg assay-Fujirebio which measures simultaneously denatured HBeAg, HBcAg and the precore protein p22cr. Abbott RealTime HBV assay for Abbott m2000 System was used to evaluate serum HBV-DNA levels in 103 samples. Samples were processed according to manufacturer's instructions.
Statistical analysis were performed by using Sperman's rank correlation analysis.

Results:

Results are shown in the table and diagram. Only samples with detectable HBcrAg and HBV-DNA higher than 10 UI/mL were considered (30 samples). There was strong positive correlation between serum HBcrAg concentration and HBV-DNA level (r_s=0,73).

		HBV-DNA		
		Non-detectable	Lower than 10UI/mL	Higher than 10UI/mL
	Total	60	13	30
HBcrAg	Non-detectable	43	0	0
	Low level	17	13	0
	High level	0	0	30



Conclusion:

Our results show a positive correlation between HBV-DNA and HBcrAg, suggesting that quantitative HBcrAg might partly reflect virus replication. According to other studies, serum HBcrAg measurement is a good quantitative serological marker for measuring chronic hepatitis B disease activity and therapy monitoring. HBcrAg measurement may allow for a continuous monitoring, especially in patients whose HBV-DNA has become undetectable by PCR.

Bibliography:

·EASL INTERNATIONAL CONSENSUS CONFERENCE ON HEPATITIS B. 13-14 September, 2002. Geneva, Switzerland
·Evaluation of the Abbott RealTime HBV DNA assay and comparison to the Cobas AmpliPrep/Cobas TaqMan 48 assay in monitoring patients with chronic cases of hepatitis B.- Ciotti M1, Marcuccilli F, Guenci T, Prignano MG, Perno CF.- J Clin Microbiol. 2008 Apr;46(4):1517-9. doi: 10.1128/JCM.02046-07. Epub 2008 Feb 13.