The hepatitis B surface antigen (HBsAg), first named as Australia antigen, was identified and linked to hepatitis in the late 1960s by Blumberg and colleagues. It is now well established that this protein forms the outer envelope of the hepatitis B virus (HBV) and constitutes the main diagnostic marker of both acute and chronic infection. This is facilitated by the fact that the protein is produced in large amount, not all of which is virus associated. Apart from the mature infectious virions known as Dane particles, two types of subviral particles devoid of nucleic acid are also produced: the 22nm spheres and filaments of longer length. The latter two forms outnumber virions by as much as 105. The high levels of circulating HBsAg have been linked to potential T-cell anergy during chronic infection, thus constituting a mechanism of immune evasion. There are 3 forms of the protein known as the small (S), medium (M) and Large (L), the latter two of which contain the S domain at their carboxyl end which is preceded by the Pre-S2 domain in the case of the M protein and Pre-S1+Pre-S2 domains in the L protein. These proteins are translated from the relevant mRNAs which are transcribed from the intrahepatic covalently closed circular DNA (cccDNA), and their level may thus reflect the replicative capacity of the virus. However, HBsAg may also be encoded by HBV-DNA sequences integrated into the hepatocyte DNA (1). The efficacy of antiviral drugs such as pegylated interferon alpha (Peg-IFNa) or nucleos(t)ide analogues (nUCs) which are used in the treatment of chronic HBV carriers is monitored by measurement of HBV-DNA levels by sensitive real time polymerase chain reaction techniques. In recent years, quantitative measurement of HBsAg levels expressed in IU/ml has become possible through the use of two commercially available tests, namely the Architect QT and the elecsys HBsAg II Quant assays. A number of studies have attempted to correlate HBsAg levels with the various phases of the natural course of chronic HBV infection, as well as determine whether they can be used as a predictive factor for a favourable outcome following antiviral treatment. In the former case, HBsAg levels during the immune tolerant phase appear to have a mean of 4.75 log10 IU/ml, as opposed to 4.2, 2.7 and 3.5 log10 IU/ml in the immune clearance, immune control and reactivation phases respectively. HBV DNA levels appear to mirror the HBsAg changes during the various phases, except for the immune control phase where HBV-DNA may be
HBsAg seroclearance in HBeAg+ patients was associated with a higher loss of HBeAg after 1 year of HBsAg by >1 log10 IU/ml during therapy with entecavir relating with HBV-DnA levels. However, a rapid decline in the decline in HBsAg levels is slower and does not correlate with HBV-DNA levels. In conclusion, a reduction in HBsAg levels during treatment, particularly at 12 and 24 weeks, may be predictive of a favourable outcome in the case of Peg-IFn treatment in HBeAg+ positive patients. However, suitable cut-off levels need to be more accurately defined. In the case of HBeAg- patients, both HBsAg and HBV-DnA decline levels at 12 weeks can be used as a guide to applying stopping rules. The picture in patients treated with NUCs is far from clear at the moment and clarification of the issues involved must await further detailed studies.

Authors’ Contribution

Completely has been done by author.

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