Antiviral natural products against hepatitis B virus infection: recent developments

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Hepatitis B virus (HBV) is inherently a hepatotropic virus that causes acute and chronic hepatitis in about one-third of world population. Of the estimated 360 million chronically infected individual, more than one million die of liver cirrhosis, fulminant liver failure or hepatocellular carcinoma (HCC) every year. Though there is an effective vaccine available, failure to protection because of vaccine-escape viral mutants in some population is also reported. Moreover, all the currently approved antiviral drugs have their limitations, too. Interferon (IFN-α) has limited efficacy and a high incidence of adverse side-effects in a proportion of CHB patients. Nucleos(t)ide analogues like, lamivudine, adefovir, tenofovir and entecavir are very effective in treating chronic hepatitis B (CHB), but long-term therapy eventually leads to drug-resistance. As an alternative approach, natural or plant products have provided promising therapeutics in modern pharma industry. Owing to their characteristics of high chemical diversity and biochemical specificity, natural products offer great promises as potentially effective antiviral drugs. A broad spectrum of phytochemicals including flavonoids (eg., vagonin), terpenes (eg., artemisinin), alkaloids (eg., oxymatrine), polyphenolics (eg., Geraniin), saponins (eg., astragaloside IV) and lignans (eg., helioxanthin) has been isolated and investigated for anti-HBV activities in vitro as well as in vivo. Nevertheless, these promising compounds have different and overlapping mechanisms of action by either inhibiting viral antigens secretions or suppression of DNA replication. The present article reviews the recent developments in anti-HBV natural products.

Keywords HBV; Hepatitis B; antivirals; nucleos(t)ide analogs; natural products; phytochemicals