The Association between Viral Hepatitis and Fatty liver/Metabolic syndrome: A Common Issue in Taiwan

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Current estimates show that the prevalence of Hepatitis B virus (HBV) infection, Hepatitis C virus (HCV) infection and of non-alcoholic fatty liver disease (NAFLD) in Taiwan is 20%, 2% and 11.5%, respectively.

Hepatic steatosis is a common feature of HCV infection and occurs in approximately 50% of infected patients. Both visceral obesity and genotype 3a play a role in the development of steatosis in the patients with HCV infection. The direct responsibility of HCV in the pathogenesis of steatosis is shown by as follows: first, the association with HCV genotype 3 infection, suggesting that some viral sequences are involved in the intracellular accumulation of triglycerides; second, correlation between the severity of steatosis and HCV replication levels; and finally, the association between the response to antivirals and the disappearance of steatosis. Experimental studies have shown that HCV modulates cellular lipid metabolism to enhance its replication. It circulates in the blood in association with lipoproteins. HCV infection is associated with enhanced lipogenesis, reduced secretion and β-oxidation of lipids. All above lead to steatosis. When hepatitis C is compared with non-alcoholic steatohepatitis (NASH), there are a number of similarities and several differences. Hepatitis C resembles NASH in numerous features, such as the presence of steatosis, serum dyslipidemia, and oxidative stress in the liver, suggesting that hepatitis C is a steatohepatitis. In contrast, there are noticeable differences between hepatitis C and NASH, in that HCV modulates cellular gene expression and intracellular signal transduction, while such have not been noted for NASH. This difference may explain the markedly higher incidence of hepatocellular carcinoma (HCC) development in chronic hepatitis C compared with that in NASH. HCV infection needs to be viewed not only as a liver disease but also as a metabolic disease, and this viewpoint could open up a novel way to the molecular understanding of the pathogenesis of hepatitis C, as a virus-associated steatohepatitis (VASH).On the other hand, over-expression of HBx was proved to induce hepatic lipid accumulation in HepG2-HBx stable cells and HBx-transgenic mice, nevertheless, most large-scale clinical studies did not show viral factor increases the morbidity of fatty liver in the cases of HBV infection.

In terms of the co-morbidity of NAFLD and viral hepatitis, NAFLD is an important cofactor in hepatitis C as it is associated with fibrosis and reduces the likelihood of

achieving early and sustained virologic response in genotype 1 infected patients. The presence of NAFLD in patients with HCV is strongly associated with features of the metabolic syndrome and is a risk factor for advanced fibrosis. It is also a predictor for HCC patients with chronic HCV infection. The components of metabolic syndrome are associated with the presence of NASH in patients with chronic HBV infection. The presence of hepatic fibrosis seems to be associated with known host and viral factors as well as the presence of abdominal obesity. A longitudinal cohort study had indicated that excess body weight is involved in the transition from healthy HBV carrier state to HCC and liver-related death among men. As to the prognosis of HBV hepatitis, the co-morbility of NAFLD, however, was reported to increase the HBsAg clearance rate in the patients with HBV infection.

Taken together, the interaction between NAFLD and viral hepatitis is complex, it demands special caution in the endemic area of viral hepatitis likes Taiwan. Finally, personalized therapy and follow-up for patients with NAFLD or viral hepatitis may be pursued in the near future.