## Hydrogen-rich water: protects liver function of colorectal cancer patients

## KYK Hydrogen Water | 1,500 PPB of DH | KYK Co., Ltd. (South Korea)



KYK Co., Ltd.

## -How mFOLFOX6 chemotherapy effect liver?

Antitumor agents are mostly cytotoxic drugs, which inevitably lead to damage of normal tissue cells and organs, or cause adverse reaction when killing cancer cells. Chemotherapeutic agents may cause liver damage, mainly including necrosis or fatty degeneration of liver cells, cholestasis and liver vessel damage. Hepatic dysfunction tends to affect the course of antitumor treatment, increasing patient discomfort and the overall financial burden.

Chemotherapeutic agents injure hepatocytes, mainly through interfering with hepatocellular metabolism and

forming oxygen free radicals, inducing hepatocellular necrosis and inflammation, or the damages are induced by hepatic fibrosis, fatty degeneration and sinusoidal obstruction. ALT and AST, which are mainly distributed in the hepatocellular cytoplasm, are the most sensitive indicators reflecting hepatocellular inflammatory injury. ALT and AST are released from damaged cells into the blood. Therefore, chemotherapy leads to an elevation in liver enzyme and IBIL levels. ALP is elevated when the bile excretion is blocked with hepatocellular injuries. TBIL is generated by the liver and excreted through the biliary tract; an elevation in serum DBIL indicates inhibition of bile excretion, or a disorder in liver uptake and bilirubin secretion.

## - How Hydrogen protects liver damage induced by chemotherapy?

Hydrogen is a naturally existing colorless, tasteless and odorless gas, and has protective effect against oxidative damage to the brain, liver, kidney and other major organs. Solubilized hydrogen (hydrogenrich water) is a portable, easily administered and safe means of delivering molecular hydrogen. Using hydrogen as a potential antioxidant has multiple advantages: It may effectively neutralize hydroxyl radicals present in tumor cells which induces hepatocellular necrosis and inflammation, unlike most known antioxidants, which cannot successfully enter the target organelles. Hydrogen has good distribution characteristics, and it can penetrate biomembrane and diffuse into the cytoplasm, mitochondrion and nucleus. Although hydrogen's activity is mild, its rapid gas diffusion properties are very effective in reducing the toxicity of free radicals in cells. Hydrogen-rich water exerts anti-oxidative stress effects on tumor tissues, and the local control rate, progression-free survival and overall survival of the patient. In addition, hydrogen-rich water does not compromise the effectiveness of chemotherapy.

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