

The validity of the INR system for patients with liver disease

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I read with interest the paper by Wei et al. [1], published recently in the *Journal of Thrombosis and Thrombolysis* on the assessment of the validity of the INR system for patients with liver disease and wish to make comments. The authors measured the INR with different commercial thromboplastins for a cohort of patients with liver disease and a cohort of patients stabilized on vitamin K antagonists (VKA). While the between-thromboplastin INRs for the patients with liver disease were significantly different, those for the patients on VKA were not. The obvious conclusion is that the INR (as it is calibrated for patients on VKA and here called INR_{vka}) is not valid for patients with liver disease and, therefore, the model of end stage liver disease (MELD) score, once proposed as an objective index to prioritize patients for liver transplantation, would not allow parity of organ allocation. In their discussion Wei et al. [1], ignored at least seven of the many papers published over the last few years on this topic. Here few examples. Trotter et al. [2], were among the first in 2004 to show that the MELD score was not effective in securing parity of organ allocation. Other papers have consistently shown (from 1994 to 1999) that the INR, devised for patients on VKA, is not valid for patients with chronic liver disease [3, 4]. In 2007, Tripodi et al. [5] and Bellest et al. [6] reported independently on the same issue of *Hepatology* that the INR_{vka} is not valid for patients with chronic liver disease as shown by the fact that the MELD, calculated by including in the equation the INR_{vka}, depends on

the thromboplastin used for testing. In the same papers these authors have independently shown that an alternative system of ISI calibration, provisionally called ISILiver (as opposed to the ISI_{vka}) [5] can be obtained by inserting into the calibration plot, plasmas from patients with chronic liver disease instead of plasmas from patients on VKA [5, 6]. This alternative system of calibration proved effective in minimizing between-thromboplastin MELD results. More recently, Sermon et al. [7], confirmed these results, and Tripodi et al. [8] extended this model of ISILiver calibration to portable coagulation monitors. Finally, a review article on this topic has been published in the *Journal of Thrombosis and Haemostasis* in 2009 [9] and official recommendations have been issued independently by the International Society on Thrombosis and Haemostasis [10] and by the American Journal of Transplantation [11]. Surprisingly, some of the above papers [2–6, 8, 9] that appeared in the literature well before the publication of Wei et al. [1] have escaped their attention.

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Abdominal Wilson's disease can manifest fulminant liver failure, acute and chronic hepatitis with the outcome of liver cirrhosis, portal hypertension and characterized edematous ascites syndrome, and bleeding from varicose veins extended GOVERNMENTAL esophagus and stomach. In some patients with Wilson's disease, there are signs of hypogonadism, manifested by disorders of the menstrual cycle, amenorrhea, infertility [4]. Skin syndrome manifests itself as vasculitis, cutaneous, vascular and thrombocytopenic purpura [4, 8]. Wilson's disease can be complicated by intercurrent infections Classification. Considerations for patients with chronic liver disease and patients after liver transplantation. The recommendations provided here address the specific characteristics of patients with liver disease and are meant to provide additional guidance for the care of these patients. General recommendations and guidelines with regards to prevention, diagnosis and treatment of COVID-19 from local authorities should be adhered to. Outpatient care. The management and surveillance of patients with advanced liver disease and those receiving immunosuppressive treatment is often performed in larger units or centres. These institutions, however, are currently also COVID-19 hotspots, thus, potentially putting outpatients with chronic liver diseases at risk of nosocomial infections. Liver disease is any disturbance of liver function that causes illness. The liver is responsible for many critical functions within the body and should it become diseased or injured, the loss of those functions can cause significant damage to the body. Liver disease is also referred to as hepatic disease. Liver disease is a broad term that covers all the potential problems that cause the liver to fail to perform its designated functions. For patients with underlying liver disease or those who abuse alcohol, that daily limit is lower and acetaminophen may be contra-indicated in those individuals. Statins are drugs commonly prescribed to control elevated blood levels of cholesterol. Even when taken in the appropriately prescribed dose, liver inflammation may occur.