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Effective albumin – A novel paradigm in the management of decompensated liver cirrhosis

Abstract: Albumin, the most abundant serum protein in human plasma, possesses several functions that make it a pleiotropic molecule. Indeed, due to its prolonged half-life and osmotic effects, albumin accounts for 70%–75% of the plasma oncotic pressure and modulates fluid distribution among the body's compartments. Besides the oncotic properties, albumin exerts several other functions, among which antioxidation plays a preeminent role. Furthermore, it can bind, store, transport, solubilize, and detoxify many endogenous and exogenous substances, including drugs, hormones, prostaglandin E2, nitric oxide, and pathogen and danger molecular patterns (PAMPs; DAMPs). Immunomodulation, endothelial protection, and influence on platelet aggregation and acid-base balance conclude this essential list. It is noteworthy that while human albumin is widely used as a plasma expander in several clinical conditions, there are no indications for its use to correct specific abnormalities, very frequent in many clinical settings, that might be counteracted by the non-oncotic properties. This shortcoming is relevant because in many diseases, including liver cirrhosis, the albumin molecule undergoes severe molecular alterations that ultimately lead to non-oncotic properties failure. The result is that the integer, fully functional albumin, the effective albumin, can be dramatically reduced. Thus, targets of the clinical use of human albumin should include restoring the circulating amount of effective albumin. Another often neglected aspect is that commercial human albumin presents various posttranslational modifications. As a result, the albumin molecule is far from being fully functional. Thus, efforts to improve the molecular integrity of commercial albumin should be a target to be achieved by manufacturers.

Biography: Mauro Bernardi is Professor Emeritus of Internal Medicine at Bologna University. He was director of the Postgraduate School of Internal Medicine and the Department of Internal Medicine and Hepatology. He chaired the Bologna University Research Observatory and the Bologna University Bioethics Committee. He served as treasurer of the European Association for the Study of the Liver, and vice-chairman of the European Consortium for the Study of Chronic Liver Failure. His main research field is Hepatology (cirrhosis, portal hypertension, and related complications). In 2015 received the Distinguished Service Award from the Italian Association for the Study of the Liver.