Francisco J Lopez-Hernandez, J Nephrol Ther 2014, 4:4
http://dx.doi.org/10.4172/2161-0959.S1.016

OMICS Group Conferences
Accelerating Scientific Discovery

3rd International Conference on
Nephrology & Therapeutics
June 26-27, 2014 Valencia Conference Centre, Valencia, Spain

New theranostic strategies for drug-induced acute kidney injury

Francisco J Lopez-Hernandez
Universidad de Salamanca, Spain

Drug-induced predisposition to acute renal failure (ARF) is a facet of nephrotoxicity hitherto mostly uncharacterized, quite underestimated, and impossible to diagnose, which potentially has a high human and socioeconomic impact. Our study has identified urinary GM2AP as the first of a new class of biomarkers of the enhanced risk of suffering an acute renal failure after a subnephrotoxic treatment with gentamicin. Gentamicin-predisposed animals with no sign of renal injury develop ARF when exposed to a second potentially nephrotoxic drug, also given at subnephrotoxic doses that are harmless to non-predisposed individuals. Subnephrotoxic gentamicin did not alter renal GM2AP gene expression or protein levels, determined by RT-PCR and Western blot and immunostaining, respectively, nor was its serum level modified. Further experiments indicate that, likely, the origin of the increased level of GM2AP in the urine might be a defective tubular handling of this protein as a consequence of gentamicin action. Markers of risk may revolutionize the prevention of ARF by enhancing our monitoring capacity of acquired predisposition to ARF, in a pre-emptive manner. With regard to the aetiological diagnosis of drug nephrotoxicity, we have identified regenerating islet derived protein III beta (reg IIIb) and gelsolin as potentially differential urinary markers of gentamicin's nephrotoxicity. Indeed, both reg IIIb and gelsolin urinary levels differentiate the nephrotoxicity caused by gentamicin from that caused by cisplatin. Reg IIIb is over-expressed in the kidneys of gentamicin-treated rats and poured into the urine, whereas gelsolin proceeds from the glomerular ultrafiltrate. Our results pose a proof-of-concept for the aetiological diagnosis of AKI through the biochemical analysis of the urine, with potential application for an enhanced drug theranostic and a more personalized medicine of polimedicated and critically ill patients at multifactorial risk of AKI. Furthermore, our studies have identified new urinary markers that differentiate ischemic from toxic acute kidney injury.

Biography

Francisco J Lopez-Hernandez earned his PhD in 1997. He is the director of the Theranostics for Renal and Cardiovascular Diseases Group at the Instituto de Investigacion Biosanitaria and Associate Professor at the Universidad de Salamanca (Salamanca, Spain). He has published over 40 articles in international journals, and 7 patents. He is an expert/reviewer for several national and international research agencies and over 30 scientific journals. He is appointed to the Editorial Board of 2 international journals. He is also involved in transfer activities and co-founded a bio-spin-off company in 2009, where he presently serves as scientific advisor.

flopezher@usal.es