

TOXICOLOGY & APPLIED PHARMACOLOGY

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Fighting opioid epidemic: Who are vulnerable and what toxicology laboratory can do

Various opioid drugs are used in pain management but unfortunately non-prescription abuse of opioid is becoming a serious public health issue especially among adolescents and young adults. On October 26, 2017, Acting Health and Human Services (HHS) secretary Eric D Hargan declares public health emergency regarding the opioid crisis. Therefore identifying population who are vulnerable to alcohol and drug addiction is important to fight opioid epidemic. There is no single genetic polymorphism which is associated with alcohol and drug abuse including opioid abuse but it has been recognized that polymorphisms of multiple genes contribute collectively in increasing risk of alcohol and drug addiction. In general genetics contribute approximately 50% while environmental factors contribute 50% in increasing risk of alcohol and drug addiction in an individual. In this session polymorphisms of important genes that may be associated with increased vulnerability of alcohol and drug addiction to an individual will be discussed. The toxicology laboratory also can play a vital role in fighting opioid epidemic by implementing a robust system for drugs of abuse testing as well as drug testing in pain management patients. Not detecting intended drug in urine indicates non-compliance or selling such drug in clandestine market. In addition, it is also important to identify patients who abuse other illicit drugs along with prescription opioid. Moreover, opioid abuse may cause medical emergency where identification of alcohol and any other drugs along with opioid is essential. However, common pitfalls of pain management testing must be avoided by communicating with ordering physician. A common mistake is negative drug testing result in a patient taking keto-opioids such as oxycodone and oxymorphone because the clinician ordered opiate drug screening in urine where immunoassay antibody designed to detect morphine lacks sufficient cross-reactivity with keto-opioids for detecting therapeutic levels of such drugs in urine after proper use. Similarly other commonly used opioids such as oxymorphone, tramadol, buprenorphine, methadone and fentanyl cannot be detected by opiate immunoassay. Therefore, in order to monitor pain management patients it is important to implement proper testing and policies in the toxicology laboratory including capability of confirming drugs using gas chromatography/mass spectrometry or liquid chromatography/tandem mass spectrometry.

Biography

Amitava Dasgupta received his PhD in chemistry from Stanford University and completed his fellowship training in Clinical Chemistry from the Department of Laboratory Medicine at the University of Washington School of Medicine at Seattle. He is board certified in both Toxicology and Clinical Chemistry by the American Board of Clinical Chemistry. Currently, he is a tenured Full Professor of Pathology and Laboratory Medicine at the University of Texas Health Sciences Center at Houston and the Director of Clinical Chemistry and Toxicology Laboratory of Memorial-Hermann Laboratory Services. His major focus of research is in the field of toxicology and therapeutic drug monitoring. He has published 225 scientific papers, wrote many invited review articles and abstracts edited, co-edited, co-authored and wrote a total of 20 books. He is on the Editorial Board of six journals including Therapeutic Drug Monitoring, American Journal of Clinical Pathology, Archives of Pathology and Laboratory Medicine, Clinica Chimica Acta, Annals of Clinical and Laboratory Science and Journal of Clinical Laboratory Analysis. He is the recipient of 2009 Irvine Sunshine Award from the International Association for Therapeutic Drug Monitoring and Clinical Toxicology (IATDMCT) for outstanding contribution in clinical toxicology and in 2010 he received AACCC Outstanding contribution to education Award.

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