**ESTIMATION OF MINOXIDIL IN HUMAN PLASMA USING UHPLC-MS/MS AND ITS APPLICATION IN PHARMACOKINETIC STUDY**

Measurement of drug concentration in biological matrices (such as serum, plasma, blood, urine, and saliva) is important to determine the Bioavailability (BA) and/or Bioequivalence (BE) of a drug product which is required during the drug product development and approval process to support applications for new active substances (INDs, NDAs) and generic (ANDAs) drug products to make critical decisions on safety and efficacy. Because of their vital role, bioanalytical methods should be well-characterized, fully validated, and documented to yield reliable results. In the present work, a simple, specific, high throughput, accurate and sensitive UHPLC–MS/MS method has been developed and validated for the quantification of Minoxidil in human plasma. The analyte and the internal standard were extracted from plasma by Liquid-Liquid Extraction using ethyl acetate. The chromatographic separation was achieved on the Thermo Hypersil Gold column (4.6x50mm, 5μm) using acetonitrile-0.1% formic acid in water (60:40, v/v) at a flow rate of 0.400 ml/min. Detection by turbo spray positive ionization mass spectrometry in the multiple reaction monitoring mode with a mass transition ion-pair of m/z 210.152 → 163.965 (Minoxidil) and m/z 220.267 → 169.089 (Internal Standard-Minoxidil D10) was found to be linear over the concentration range of 1.280 to 151.075 ng/ml. The method was fully validated as per USFDA guidelines and the results were within regulatory limits. The inter and intra-day precision ranged from 5.42 to 9.27% and 2.55–9.42% respectively. The inter and intra-day accuracy ranged from 89.2 to 98.9% and 102–105% respectively. The method was successfully applied to a BE study involving human volunteers.