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Quantification of bilirubin on dry blood spot by tandem mass spectrometry

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Background: Hyperbilirubinemiais caused by many kind diseases and is harmful to neonate development, it is necessary to detecthyperbilirubinemia as early as possible, or probably detect biliary atresia (BA) earlier. A new method for screening and clinical determination of blood bilirubin on a dry blood spot (DBS) using tandem mass spectrometry (MS/MS) was developed.

Methods: The serum bilirubin controls and blood were prepared as DBS, extracted into a methanol solution containing isotope-labeled external standards, were subjected to HPLC, detect by MS/MS. Multiple-reaction monitoring of m/z 585—299 for unconjugated bilirubin(UBIL), m/z761—585 for monoglucuronide bilirubin(BMG) and m/z 937—585 for diglucuronide bilirubin (BDG) were used to detect bilirubins.

Results: The recoveries of UBIL by MS/MS were 90%-120.31% with an R2 value of 0.928 after linear regression ($p<0.001$). The coefficients of variation were less than 20%.The blood UBIL in neonates aged 3-7 days (68.14±21.56umol/L) was higher than in children aged older than 1 mouth(38.24±7.95umol/L). BMG and BDG were not higher in BA than control significantly.

Conclusion: Quantification of UBIL on a dry blood spot by MS/MS is accurate, reliable and feasible for screening and clinical tests. There may be δ-bilirubin caused direct bilirubin elevated in BA.

Biography

Zhenhua GONG has completed his PhD at the age of 40 years from Fudan University,Shanghai China. He is pediatric surgeon, associated professor and director of a research team focusing on metabolic diseases and biliary atresia. He has published more than 10 papers in reputed journals and serving as an editorial board member of repute.

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