Poster Abstracts

PO-02

DEVELOPMENT OF THE HEADSPACE-SOLID PHASE MICROEXTRACTION GAS CHROMATOGRAPHY MASS SPECTROMETRY (HS-SPME-GC-MS) FOR DETERMINATION OF 35 PESTICIDES IN PLASMA

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Objectives: To develop sensitive analytical procedures to quantitatively identify 35 pesticide from five major classes including organochlorine, organophosphorus, fungicide, pyrethroid and organonitrogen pesticides in plasma simultaneously by using Headspace-Solid Phase Microextraction Gas Chromatography Mass Spectrometry(HS-SPME-GC-MS).

Methods: This is an in vitro study to develop sensitive analytical procedures to quantitatively identify 35 pesticide standards added to plasma obtained from healthy supposed non exposed subjects by using Solid-Phase Microextraction(SPME) method coupled with Gas Chromatography Mass Spectrometry(GC-MS). Our study included selection of an appropriate coating of required small diameter optical fiber, optimization of parameters and analysis of HS-SPME procedure; extraction and analysis of pesticides by GC-MS analysis; and validation of developed method according to the U.S. Food and Drug Administration guideline and Eurachem(The Fitness of Purpose of Analytical Method) guide 1998. This study was funded by Routine to Research(R2R) Grant, Faculty of Medicine Siriraj Hospital, Mahidol University.

Results: The best setting of our developed HS-SPME-GS method included using Polydimethylsiloxane/Divinylbenzene /Carboxen coated fiber, extraction temperature of 70 degree Celcius for 40 minutes, and the 30%(weight/weight) NaCl added to the extraction solution. This method yielded a good linearity with the coefficient of determination(r2) more than 0.995 at the concentration of 0.05-1 mcg/mL. The coefficient of variance(CV) was less than 15 percent. The percent relative value(%RV) was between 85 and 120 percent. The lower limit of detection was 0.02 mcg/mL. This method could not detect abamectin. Our developed method can detect wider spectrum of pesticides simultaneously by using HS-SPME-GS technique compared with previously published methods. It had good accuracy, high precision with low threshold limit of detection. This can be applied to serum samples from exposed patients.

Conclusion: We successfully developed a method to quantitatively determine 34 pesticides in five major classes including organochlorine, organophosphorus, fungicide, pyrethroid and organonitrogen pesticides in plasma simultaneously by using the HS-SPME-GC-MS, however abamectin was not detected by this technique.