α-Tocopherol (5,7,8 trimethyltocol) is the most biologically active form of vitamin E that is present in lipoproteins. It has been recognized as a classic free radical scavenger with chain-braking properties and as one of the most important fat-soluble antioxidant in biological systems (1). α-tocopherol may play a key role in prevention of some cancer. Numerous epidemiological studies have demonstrated an association between higher intakes or higher blood concentration of vitamins and a lower incidence of certain degenerative diseases (2,3).

The aim of this study was to develop a simple, precise, accurate and specific GC-FID method for determination of α-tocopherol from human plasma and to examine whether α-tocopherol concentrations in cancerous plasma are increased or decreased when compared to noncancerous plasma after a single oral administration of 400 I.U. of α-tocopherol.

The chromatographic conditions of the GC-FID methods using vitamin K<sub>2</sub> as the internal standard were optimized. The solvent mixture of hexane and dichloromethane (90:10) was selected for our liquid-liquid extraction method. This solvent mixture gave good recovery and the extraction recoveries of α-tocopherol from plasma was better than 94.6%. The developed GC-FID method was validated with validation parameters containing linearity, precision, accuracy, recovery, specificity and sensitivity. The method has a wide linear over the 4.87-24.37 µg/mL (0.5-20 µg/mL) of concentration range (we estimated that endogenous α-tocopherol has a concentration of approximately 4.37µg/mL by the standard curve according to the procedure of the standard addition method). The precision of this method was calculated as the percent relative standard deviation (R.S.D.) was less than 5.4%, and accuracy (relative error) was better than 4.5% (n = 6).

The developed and validated method could be successfully applied to the in-vivo determination of α-tocopherol measured in plasma samples (one millilitre blood samples were collected at 0 (before dosing), 12, 24 and 48 h after dosing) from six healthy volunteers and six bladder cancer patients following oral administration of single dose of α-tocopherol (Evicap® soft gelatin capsule; 400 I.U.). Obtained data in this study were compared by Student-t test (at 95 % confidence level). There is no significant difference between plasma concentration of α-tocopherol of healthy volunteers and plasma concentration of α-tocopherol of bladder cancer patients (for 0 h; t<sub>10</sub>=0.380; P>0.05, for 12 h; t<sub>10</sub>=1.125; P>0.05, for 24 h; t<sub>10</sub>=0.431; P>0.05, for 48 h; t<sub>10</sub>=0.758; P>0.05).

References