Marijuana use draws an attention from the public and represents a worldwide problem. The most psychoactive active component of marijuana is THC (delta-9-tetrahydrocannabinol) [1]. The determination of urinary cannabinoid excretion is very important especially in medico-legal cases. Analytical methods for detecting cannabinoids fall into two categories: screening methods and confirmatory methods [2]. Screening tests are easy and fast but their specificity and sensitivity are not high. Cup tests are frequently used to screen the urinary cannabinoids in clinical laboratories, but the visual determination of these tests sometimes becomes challenging, especially when the specimen cannabinoid concentrations are near the cut-off values. The positive/borderline results must be confirmed by an alternate analytical method; generally Gas Chromatography-Mass Spectrometry (GC-MS) [3]. The aim of this study is to evaluate borderline results of cup tests with GC-MS.

The urine specimens were taken from the probationers who were court-ordered to BATI. The urine analyses of the subjects were first performed by Screen Dipcards according to the manufacturer’s instructions. The urine samples (n =36) giving a borderline result (which are normally reported as negative) were included in this study. All urine samples were tested for urine adulteration/dilution. Liquid-liquid extraction was used to prepare the samples prior to GC/MS analysis. Derivatization was made by N,O bis(trimethylsilyl) trifluoroacetamide (BSTFA) in %1 trimethylchlorosilane (TMCS).

The evaluation of GC/MS results were done according to the cut-off value of THC drug screen device (50 ng mL⁻¹). Four false negative results were obtained in samples examined where THC concentration is <50 ng mL⁻¹. Moreover five false negative results were detected when THC concentration is >50 ng mL⁻¹. The THC concentration in the urine samples were found to be within the range of 30-97 ng mL⁻¹ (mean 62.2 ng mL⁻¹).

Qualitative and semi-quantitative screening tests are commonly used for substance analysis. In order to reduce false negative results, sensitivity has to be taken into consideration. Scientific awareness of the toxicological methods should be standardized in Turkey for justness especially in medico-legal cases.

KEYWORDS: delta-9-tetrahydrocannabinol, GC/MS, cup tests, urine

REFERENCES: