Research Article

Toxicological Features of Catha edulis (Khat) on Livers and Kidneys of Male and Female Sprague-Dawley Rats: A Subchronic Study

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Hepato- and nephrotoxicity of Khat consumption (Catha edulis Forskal) have been evoked. Therefore, this study was conducted to evaluate such possible hepatorenal toxicity in female and male Sprague-Dawley rats (SD rats) housing primarily on liver and kidney. In addition, female and male rats were investigated separately. Accordingly, forty-eight SD-rats (100–120 g) were distributed randomly into four groups of males and female (n = 12). Normal controls (NCs) received distilled water, whereas test groups received 300 mg/kg (low dose (LD)), 1000 mg/kg (median dose (MD)), or 2000 mg/kg (high dose (HD)) of crude extract of Catha edulis orally for 4 weeks. Then, physical, biochemical, hematological, and histological parameters were analyzed. Results in Khat-fed rats showed hepatic enlargement, abnormal findings in serum aspartate aminotransferase (AST), and alkaline phosphatase (ALP) of male and female SD-rats and serum albumin (A) and serum creatinine (Cr) of female as compared to controls. In addition, histopathological abnormalities confirmed hepatic and renal toxicities of Khat that were related to heavy Khat consumption. In summary, Khat could be associated with hepatic hypertrophy and hepatotoxicity in male and female SD-rats and nephrotoxicity only in female SD-rats.

1. Introduction

Khat is the most common name for Catha edulis plant [1] which is consumed for its psychostimulatory effect [2]. Unfortunately, Khat became a serious public health problem in Yemen [2]. The chewing of Khat leaves has involved at least 80% of adult males [3] and extended to women, too [4]. The WHO (2003, 2006) reported that Khat consumption has become a common problem that affects the health aspects of life [4]. In fact, many adverse effects have been associated with Khat consumption [2]. Accordingly, prolonged exposure to Khat could result in psychoneurological disturbances such as neurosis [5]. In addition, increased diastolic blood pressure [6] and vasoconstriction of coronary vasculature were also reported [7]. More commonly, gastritis [8], hemorrhoids, and duodenal ulcer had a higher prevalence among Khat chewers [9]. Furthermore, Luqman and Danowski reported that liver cirrhosis that was observed among Yemeni Khat chewers might be due to Khat consumption, but at that time it was not further investigated [10], and hepatotoxicity of Khat chewing is still debated in humans [11–13]. In animals, the administration of crude extract of Khat to New Zealand white rabbits for three months suggested toxic hepatocellular jaundice as well as histopathological abnormalities in livers of such animals [14]. Likewise, a companion study on