

# Association between Uric Acid and Metabolic Syndrome in Qazvin Metabolic Diseases Study (QMDS), Iran

## *Association between Uric Acid and Metabolic Syndrome*

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### Abstract

**Background:** The prevalence of Metabolic Syndrome (MS) has been increasing worldwide. Although Uric Acid (UA) Levels are often increased in subjects with MS, it is still unclear whether uric acid plays a causal role for MS or is a marker. The purpose of this study was to examine the association between UA and the MS in Qazvin, Iran.

**Methods:** 529 men and 578 women aged 20 – 78 years attended in cross sectional study from September 2010 to April 2011 in Qazvin, Iran. The criteria proposed by new joint Interim societies (JIS) were applied for diagnosis of MS. Hyperuricemia was defined as UA  $\geq$  7 mg/dL in men and UA  $\geq$  6 mg/dL in women. Logistic regression analysis was performed to evaluate the relationship between UA quartiles and MS.

**Results:** The prevalence of MS was found to be 39.3%. Prevalence of hyperuricemia was 8.4% in males and 4.1% in females ( $P=0.004$ ). Mean UA level was higher in males than in females ( $P<0.001$ ). UA levels increased significantly with an increasing number of MS components in both genders. Prevalence of MS increased across UA quartiles in females; however the increasing trend began from second quartile in males. Using the lowest quartile of UA level as a reference, there were no significant association between UA quartile groups and MS.

**Conclusion:** This study showed that UA levels are not an appropriate predictor of MS in Iranian population. More longitudinal studies are necessary to confirm the role of UA in MS occurrence.

**Keywords:** prevalence, hyperuricemia, logistic regression, association, uric acid

### 1. Introduction

The metabolic syndrome (MS) refers to a cluster of risk factors, including abdominal obesity, high blood pressure, dyslipidemia and increased plasma glucose (Eckel, Grundy, & Zimmet, 2005). MS is a modern epidemic that is strongly associated with the development of cardiovascular disease and diabetes mellitus (Wilson et al., 2005; Tsouli et al., 2006). The prevalence of MS has been increasing worldwide (Meshkani, Zargari, & Larijani, 2010). In an Iranian study, the prevalence of MS was 30.1% (Azizi et al., 2003). Increasing evidence suggests that uric acid (UA) level may play a role in the MS (Chiou et al., 2010; Nan et al., 2008; Sui et al., 2008).

Large epidemiological studies have established the association of increased serum uric acid levels with MS and its individual components (Lin, Tsai, & Hsu, 2006; Onat et al., 2006; Choi & Ford, 2007; Reimann et al., 2008; Liu, Chang, & Chen, 2010; Saggiani et al., 1996; Bonora et al., 1996; Athyros et al., 2005; Zimmet et al., 1994). Additionally, UA level has been associated with increasing numbers of MS components (Tsouli et al., 2006; Lin, Tsai, & Hsu, 2006; Schmidt et al., 1996). Although UA Levels are often increased in subjects with MS (Yoo et al., 2005; Schmidt et al., 1996), none of the proposed definitions include UA levels in its criteria (Tsouli et al.,