Chapter 1 Introduction 1.1 Overview The relationship between serum uric acid (SUA) levels and metabolic risk factors in patients with type 2 diabetes mellitus (T2DM) has attracted considerable research interest, particularly regarding its impact on estimated glomerular filtration rate (eGFR). In addition, elevated SUA levels are closely associated with impaired renal function, thus suggesting its involvement as an indicator for the development of diabetic complications. There exists evidence that people with T2DM usually possess significantly high SUA levels compared to those without DM (non-diabetic). Additionally, studies show there is an association between rising SUA concentrations and declining eGFR, implying some role played by hyperuricemia (HUA) on progressing diabetic kidney dysfunction (Sumina Cherian, 2024). 1.1.1 Relationship Between UA and T2DM Onset Higher SUA levels are independently related to the presence and development of diabetes, indicating that SUA plays a potentially causative role during disease progression. Individuals with elevated UA are more likely to develop T2DM than individuals without. Therefore, SUA could serve as a valuable biomarker for identifying people with high risks of T2DM onset and determining their prognosis (Bral et al., 2024; Zehra, 2024). Studies have constantly reported a significant relationship between HUA and T2DM. SUA can act simultaneously as a risk factor and a sign of disease progression (Zehra, 2024). Also, observational studies showed that an elevation of SUA was an independent predictive marker for the development of T2DM (Bral et al., 2024). The ratios of resistin-to-UA and adiponectin-to-UA were found to be able to forecast metabolic syndrome (MetS) evolution in patients suffering from T2DM. Therefore, we can conclude that UA plays an important role in the adipokine signaling pathways, leading to insulin resistance (IR) and metabolic dysregulation. Thus, this compound could be used as an effective biomarker for determining who has a high probability of developing T2DM along with related complications (Fajki et al., 2025).

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