



The Impact of Various Sugammadex Doses on Renal Ischemia-Reperfusion Damage, An Experimental Study

Hasan KANAR¹, Ufuk KUYRUKLUYILDIZ¹, Hakan Gokalp TAS^{1*},
Necip Gokhan TAS², Selim ZIRH³ & Nezahat KURT⁴

¹ Department of Anesthesiology and Reanimation, Faculty of Medicine,
Erzincan Binali Yildirim University, Research Assistant, Erzincan-Turkey

² Department of Experimental Animals Application and Research Center,
Erzincan Binali Yildirim University, Research Assistant, Erzincan-Turkey

³ Department of Histology and Embryology, Faculty of Medicine,
Erzincan Binali Yildirim University, Assistant Professor, Erzincan-Turkey

⁴ Department of Medical Biochemistry, Faculty of Medicine,
Erzincan Binali Yildirim University, Assistant Professor, Erzincan-Turkey

SUMMARY. The purpose of this study is to investigate the effects of sugammadex on the histopathological and biochemical changes caused by renal ischemia-reperfusion injury in rats. Four rat groups were used in the study: HG (n=6), RIR (n=6), SIR4 (n=6), and SIR16 (n=6). Sugammadex 4mg/kg and 16 mg/kg were given to SIR4 and SIR16 rats respectively. A laparotomy was performed, as well as renal ischemia (1 h) and reperfusion (6 hs). IL-1 β , tGSH, NF- κ B, MDA, TNF- α , and histopathology were all examined in kidney tissue. Urea and creatinine (Cre) levels were measured in blood samples. At doses of 4 mg/kg and 16 mg/kg, sugammadex was found to decrease I/R injury based on biochemical measurements, albeit not in a statistically significant way. Histopathological analysis likewise revealed a reduction in damage ($p < 0.05$). It was discovered that higher dosages of sugammadex were more successful in avoiding renal I/R damage.

RESUMEN. El propósito de este estudio es investigar los efectos del sugammadex sobre los cambios histopatológicos y bioquímicos causados por la lesión por isquemia-reperfusión renal en ratas. En el estudio se utilizaron cuatro grupos de ratas: HG (n=6), RIR (n=6), SIR4 (n=6) y SIR16 (n=6). Se administraron 4 mg/kg y 16 mg/kg de sugammadex a ratas SIR4 y SIR16 respectivamente. Se realizó laparotomía, isquemia renal (1 hora) y perfusión (6 horas). Se examinaron IL-1 β , tGSH, NF- κ B, MDA, TNF- α y la histopatología en tejido renal. Se midieron los niveles de urea y creatinina (Cre) en muestras de sangre. En dosis de 4 mg/kg y 16 mg/kg, se encontró que sugammadex disminuyó la lesión I/R según mediciones bioquímicas, aunque no de manera estadísticamente significativa. El análisis histopatológico también reveló una reducción del daño ($p < 0,05$). Se descubrió que dosis más altas de sugammadex tenían más éxito para evitar el daño renal I/R.

KEY WORDS: kidney, ischemia/reperfusion, oxidative stress, sugammadex,

* Author to whom correspondence should be addressed. E-mail: hakangokaltas@hotmail.com