



Metoprolol and Losartan: their Effect on the Isoprenaline-Induced Heart Failure in Mice

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SUMMARY. This study was aimed at the investigation of therapeutic as well as pharmacological effects of metoprolol (Met, β -blocker) and losartan (Los, angiotensin-converting enzyme inhibitors, ARBs) on isoprenaline (Iso)-induced left ventricular hypertrophy (LVH) in mice model. The Kunming mice (21-24 g) were randomly divided into six groups (n = 30), namely control, model, Met 20, Met 40, Los 10, and Los 20, respectively. To induce LVH, the mice were treated with Iso along with a continuous supply of food and water for two weeks. LVH was confirmed by swimming and hypoxia tests. After successful induction of LVH, Los (10 and 20 mg) and Met (20 and 40 mg) was administered for further two weeks, followed by swimming and hypoxia tests. Two weeks after treatment, the heart tissues were collected and subjected to western blot and real-time PCR examinations by using caspase-3, Bcl-2, and Mfn-2 in Met treated mice, and CD31, CD34, and KDR genes in Los treated mice to confirm the apoptosis. Although, both Met and Los significantly reduced LVH; however, Met40 and Los10 provided better therapeutic strategy in LVH. There may be some useful clinical relevance with Met and Los study in diseased animal models with Iso administration.

RESUMEN. Este estudio se dirigió a la investigación de los efectos terapéuticos y farmacológicos del metoprolol (Met, bloqueador beta) y el losartán (Los, inhibidor de la enzima convertidora de angiotensina, BRA) sobre la hipertrofia del ventrículo izquierdo inducida por isoprenalina (Iso) en modelo de ratones. Ratones Kunming (21-24 g) se dividieron aleatoriamente en seis grupos (n = 30), a saber, control, modelo, Met 20, Met 40, Los 10 y Los 20, respectivamente. Para inducir la HVI, los ratones se trataron con Iso junto con un suministro continuo de comida y agua durante dos semanas. La HVI se confirmó mediante pruebas de natación e hipoxia. Después de la inducción exitosa de HVI, se administraron Los (10 y 20 mg) y Met (20 y 40 mg) durante otras dos semanas, seguidas de pruebas de natación e hipoxia. Dos semanas después del tratamiento, los tejidos del corazón se recogieron y se sometieron a Western blot y exámenes de PCR en tiempo real mediante el uso de caspasa-3, Bcl-2 y Mfn-2 en ratones tratados con Met y CD31, CD34 y KDR para confirmar la apoptosis. Aunque tanto Met como Los redujeron significativamente la HVI; sin embargo, Met40 y Los10 proporcionaron una mejor estrategia terapéutica para la LVH. Puede haber alguna relevancia clínica útil con el estudio de Met y Los en modelos de animales enfermos con administración de isoprenalina (Iso).

KEY WORDS: apoptosis, heart failure, isoprenaline, left ventricular hypertrophy, losartan, metoprolol.

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