Abstract:

The outcome of drug interaction may be harmful if the interaction causes an increase in the toxicity of the involved drugs. The aim of this work is to study the possible interaction of three drugs: Acetyl Salicylic Acid (ASA), Lisinopril, and Spironolactone, which are commonly used in the treatment of cardiac diseases and to investigate their effects on the kidney. Two hundred female albino rats with an average weight of 180 ± 20 grams were included and divided into eight groups. Group I was fed on ordinary rat diet was used as a control group. Group II was given ASA, orally in a dose 100mg/kg/day dissolved in distilled water. Group III was given spironolactone, orally in a dose 30mg/kg/day dissolved in distilled water. Group IV was given lisinopril, orally in a dose 20mg/kg/day dissolved in distilled water. Group V was given both ASA and spironolactone, orally in the same doses. Group VI was given ASA and lisinopril. Group VII was given spironolactone and lisinopril. Group VIII was given ASA, spironolactone, and lisinopril. After thirteen weeks of daily treatment blood samples were taken from the rats for measurement of serum urea, creatinine, and potassium. Then these rats were sacrificed and dissected for light microscopic examination of their kidneys and adrenal glands. Biochemical analysis revealed a significant increase in serum urea concentration in groups V (ASA and spironolactone), VI (ASA and lisinopril), VII (spironolactone and lisinopril), VIII (ASA, spironolactone and lisinopril), and a highly significant increase in group II (ASA). The results revealed a significant increase in serum creatinine concentration in groups IV (lisinopril), VI and VIII. A highly significant increase in serum creatinine concentration was observed in groups II, III (spironolactone), V and VII. There was a significant increase in serum potassium concentration in groups III, IV, V, VII, and VIII. Histopathological examination of the kidney specimens showed cloudy swelling in groups II, III, V, VI, VII, and VIII. Inflammatory cellular infiltration mainly by lymphocytes was observed in groups II, IV, V, VI, VII, and VIII. There were hyperlobulation of the glomeruli in groups II, and VI. Groups IV, V, and VI showed fatty degeneration. Casts in the tubular lumen were detected in group III. The results revealed thick walled blood vessels in groups IV, VI and mesengial cell hyperplasia in group VI. Histopathological examination of the adrenal gland specimens showed spironolactone bodies in groups. III, V, VII, and VIII. Therefore, it is recommended that the combination of aspirin and lisinopril is not safe and should be avoided especially in patients with renal diseases. Spironolactone should be taken with caution when administered with lisinopril for fear of serious hyperkalemia and it is better to be administered with drugs causing hypokalemia such as thiazide diuretics.

Keywords:

Drugs - Interaction - Treatment - Cardiac diseases

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