COMPARATIVE STUDY OF THE RENOPROTECTIVE EFFECT OF ANGIOTENSIN CONVERTING ENZYME INHIBITORS, HYDROXY METHYL GLUTARAYL Co-A REDUCTASE INHBITORS AND ALDOSTERONE RECEPTORS ANTAGONISTS ON EXPERIMENTALLY INDUCED NEPHROTIC SYNDROME IN ALBINO RATS

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Abstract

Heavy glomerular proteinuria, also known as nephrotic syndrome, is a common feature of numerous primary and secondary nephropathies, accompanied with a high rate of recurrence (relapses) and progression to chronic kidney failure. Nevertheless, current therapy is still not fully satisfactory; this led to an arousal of some promising therapeutic strategies in which their positioning should be evidenced. *Objective:* is to demonstrate and compare the possible renoprotective effects of some proposed therapeutic strategies including the angiotensin converting enzyme inhibitors, the aldosterone receptor blockers and the lipid lowering HMG-CoA reductase enzyme inhibitors, on *adriamycin*-induced nephrotic syndrome in male albino rats. *Methodology:*54 male albino rats were divided in 9 groups, in which **Group I** was the control group receiving a single saline injection followed 2 weeks later by daily oral saline therapy for 2 weeks, groups (II-IX) received single adriamycin injection (5 mg/kg) *to induce nephrotic syndrome* followed 2 weeks later by daily therapy for 2 weeks**, group II (nephrotic, non-treated rats):** received daily *oral saline* (2.5 ml /kg), **group III (nephrotic rats,** *captopril* **treated):** received daily *oral Captopril* (50 mg/kg), **group IV (nephrotic rats,** *spironolactone* **treated):** received daily *oral spironolactone* (25 mg/kg)**, group V (nephrotic rats,** *simvastatin* **treated)**: received daily *oral simvastatin* (10 mg/kg), **group VI (nephrotic rats,** *captopril and spironolactone* **treated), group VII (nephrotic rats,** *captopril* **and** *simvastatin* **treated)**, **group VIII (nephrotic rats,** *spironolactone* **and** *simvastatin* **treated)** and **group IX (nephrotic rats;** *captopril, spironolactone* **and** *simvastatin* **treated).** *Results:* revealed reduction in proteinuria and triglycerides levels following captopril and spironolactone administration either given separately, as double therapy or as triple therapy when added to statin. However, statin therapy revealed an eminent effect on serum lipid levels and endothelial dysfunction when administered as monotherapy, double therapy with either drugs or as triple therapy. *Conclusion*: Angiotensin converting enzyme inhibitors and aldosterone receptor blockers represent promising alternative strategies to reduce proteinuria and, possibly, delay progression of renal disease. This renoprotective effect increased with their combination as double therapy or as triple therapy when added to statin. However, the effect of statin therapy was more evident in improving significant endothelial dysfunction.

Key words: nephrotic syndrome, renoprotection, captopril, spironolactone, statin.

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List of Abbreviations

- **ACEIs** : angiotensin-converting enzyme inhibitors
- **ACTH** : Adrenocorticotrophic hormone
- **ADR** : adverse drug reaction
- **AIDS :** acquired immunodeficiency syndrome.
- **ANP :** Atrial natriuretic peptide
- **ARBs:** angiotensin receptor blockers
- **AT1R** : angiotensin type 1 receptor
- **AT-II :** Angiotensin II
- **C :** Captopril
- **CSA :** cyclosporin A
- **CYP :** cyclophosphamide
- **ESKD :** end-stage kidney disease
- **FSGS :** focal segmental glomerulosclerosis
- **HMG-CoA:** hydroxymethyl-glutaryl Co-enzyme A
- **Hx & Eu:** Haematoxylin and Euosin
- **Ig**: immunoglobulin
- **IMN :** Idiopathic membranous nephropathy
- **INS :** idiopathic nephrotic syndrome
- **MCNS :** minimal change nephrotic syndrome
- **MN:** membranous nephropathy
- **NS :** Nephrotic syndrome
- **PE:** pulmonary embolism
- **PHN :** passive Heymann nephritis
- **PNS :** Primary nephrotic syndrome
- **PV :** plasma volume
- **RAAS :** renin-angiontensin-aldosterone system
- **RENaC :** renal epithelial sodium channel
- **Sm :** Simvastatin
- **Sp :** Spironolactone
- **SRNS :** steroid resistant NS
- **SSNS :** steroid-sensitive NS
- **TAC :** tacrolimus
- **TEC:** thromboembolic complications

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