P: ISSN NO.: 2321-290X RNI : UPBIL/2013/55327 VOL-5* ISSUE-5* January- 2018
E: ISSN NO.: 2349-980X **Shrinkhla Ek Shodhparak Vaicharik Patrika**

Adverse Effect of PROP and HCTZ Combined Drug Therapy on Kidney Protein and Cholesterol of Albino Rat

Abstract

The Present study stated that combined drug therapy PROP And HCTZ adverse effect on kidney biochemistry of albino rat. Both antihypertensive drug agents β- blockers propranolol and hydrochlorothiazide diuretic drug most often prescribed for the treatment of hypertension perfusion studies were interpreted by means of biochemical analysis, provided that PROP and HCTZ combined drug therapy inhibits renal total protein and cholesterol and initial dose of 40mg / Kg and 25mg / Kg body weight was with in normal limit among all treatment groups. Although this finding contracted conventional wisdom regarding with increment in renal protein and cholesterol it was found that the administration of PROP and HCTZ combined therapy was very effective.Lastly concluded elevation of biochemical parameters determine for PROP and HCTZ adverse effect in metabolic situation.

Manish Maheshwari
Assistant Professor,
Deptt.of Zoology,
NREC College,
Khurja, Bulandshahar,
U. P.

Keywords: Propranolol (PROP), Hydroclorothiazide (HCTZ), Kidney, Protein and Cholesterol

Introduction

PROP and HCTZ is used to treat high blood pressure (hypertension). Lowering high blood pressure helps prevent strokes, heart attacks and kidney problems PROP is a beta blocker that works by blocking certain natural chemicals in our body that affect the heart and blood vessels. This effects reduces heart rate, blood pressure and strain on heart. HCTZ is called water pills and coursed our body to get rid of extra salts and water. This effects may increase the amount of urine. It also help to relax the blood vessels so the blood can flow through the body more easily.

Aim of Study

The purpose of present study is to see the adverse effect of propranolol and hydrochlorothiazide drug therapy on the renal biochemistry.

Review of Literature

The change in liver and renal glomeruloscleratic condition in human (Wieme and Maercke Von 1961).Lewy and Windharger (1968) observed the particular control of proximal tubular reabsorption in rat kidney while Furamen (1970) diuretic induced hyperglycemiain mouse. Walman and Volt (1971)renal lesions in experimental hypercholesterolemia in normal diabetic rabbit . Hisikawa and Kikuchi (1973) noted an aderargic mechanism of diuretic drug chlorobanzyle methyl sulphoxide and their action in rats. Purkerson et.al (1976) pathogensisof glomerulopathy with renal infraction in rats Woefel (1977) that of hydrochlorothiazide on the crystallization of calcium oxalate in human unine. Maheshwari (2002), Singh and Maheshwari (2004) reported the effects of carbonic anhydrase inhibitor, acetazolamide on kidney and blood biochemical parameters in rat, while Maheshwari (2004) noted combined effect of propranolol and hydrochlorothiazide on renal architecture and renal biochemical parameters in albino rat. Su XH et.al (2014) cardiovascular effects of ethanol extract of Rubus cingil Hu (Rosaceae) in rats while Zal F(2014) shows combined effect of furasemide and propranolol on GSH homeostasis on ACHN kidneyl cell and Prieto I et al (2016) angiotensinase effect on blood pressure, heart and kidney Frindt G**,** (2017) Responses of distal nephron Na+ transporters to acute volume depletion and hyperkalemia in man. De Almeida (2018) diuretic and saluretic effect of nothofagin in hypertensive rat kidney

Tools

Present study has been made on acclimatized specimens of albino rat *Rattus norvegicus* . Animals were breeded in the laboratory with GLP. Animals were housed in controlled temperature, humidity and light cycle. They fed standered goldmohar brand feed and water ad libitum. For Present study PROP (trade name–ciplar40) with HCTZ (trade name- aquazide25) were selected. Each dose PROP 40 mg\kg and HCTZ 25mg\kg body weight daily for 10, 20, 30 and 40 days. Drugs were dissolve in N-saline water and given to rats orally through cathedral tube. We use Lowery et al(1951) methods for tissue protein and Zlatkis et al (1953) for cholesterol. The results were subjected to statistical analysis (Fisher and Yates,1963).

Results and Findings

In present study the combined drug **PROP and HCTZ** therapy for 10,20,30, and 40 days carefully studies on kidney biochemical parameters in rat. An increase in total protein and cholesterol with increase in time period of combined drug therapy is very highly significant ($p<0.001$). Table 1 and 2] due to adverse effect of PROP and HCTZ combined drug treatment for10, 20, 30 and 40 days. PROP and HCTZ combination also increase lipid contents, glucose level in the body, which also correlated with infilammation and lesions in kidney of rats (Maheshwari, 2004). Arther(2002) and Gluck (1978) reported that have been reported cholesterol and protein increase after treatment of antihypertensive drug on plasma potassium and catchacholamine levels in blood and also significant changes in the glucose tolerance and acetyle Co-A in liver, which is might results from increase the synthesis of lipids and disturb the catabolism by the activation of lipolysis .

Discussion and Suggesions

These adverse side effects due to the biotransformation of these drugs compound in the liver and effect the metabolic activites of lipids, carbohydrates and proteins in various tissues. An adverse effects of PROP and HCTZ diuretic drugs depands upon the bioavailability, distribution and extent of elimination and responsiveness of drug. In antihypertensive drug therapy are reliable of impacts of such drugs on the blood pressure due to effects on heart. The side effects are excreted to be more using combined therapy as potentially serious hypercalemia, glomerular sclerosis, various llesion in the kidney and other organs (Pereire et. Al, 2002)The use of certain ditretic,β- blockers constimations at least at short term or long term produced some alterations in metabolism with these therapy and obtain additive synergetic effects in human and animals and a possible influence or can concommittent administration (Arther, 2000). The result of present study is indicate that combined drug therapy of PROP and HCTZ not better for renal failure patients.

Table-01

Adverse effect of Combined PROP/ HCTZ therapy on kidney total protein of Albino Rats

S. No	Drug administration Time(in days)	No. of rats	Kidney total protein (in µg/dl)					
			Control group			Treated group		
			Range	Mean	+_S.Em	Range	Mean	+_S.Em
1	10	10	111.11-155.55	136.66	+_5.5	355.55-444.44	395.55	+_5.5***
2	20	10	111.11-166.66	145.55	+_6.2	422.22-522.22	465.55	+_5.5***
3	30	10	144.44-200.00	176.66	+_5.6	477.77-522.22	499.99	+_5.5***
4	40	10	155.55-211.11	187.21	+_6.6	505.55-577.77	531.1.	+_5.5***

Table-02

Adverse effect of Combined PROP/ HCTZ therapy on kidney total cholesterol of Albino Rats

S.No	Drug administration Time (in days)	No.of rats	Kidney total cholesterol (in mg/gm. Tissue weight)					
			Control group			Treated group		
			Range	Mean	+_S.Em	Range	Mean	+_S.Em
1	10	10	0.096-0.116	0.105	+_5.5	0.136-0.172	0.156	+_5.5***
2	20	10	0.096-0.119	0.107	+_5.5	0.160-0.224	0.194	+_5.5***
3	30	10	0.104-0.124	0.118	+_5.5	0.180-0.240	0.204	+_5.5***
4	40	10	0.112-0.134	0.126	+_5.5	0.240-0.304	0.264	+_5.5***

S.Em = standerd error of mean

*** = very highly significant.

Conclusion

Lastly concluded that combined PROP and HCTZ therapy on kidney protein and cholesterol due to adverse effects in metabolic situations in rats. Because the physiology and anatomy of rat is much similar to man so Don't take this combination with out physician prescription.

References

1. *Wieme RJ and Maercke Van (1961) The serum lactic dehydrogenase as a index of liver injury . Am. New York Acd. Sci.: 94;pg.no.898-910*
2. *Lewy JE and Windhager EE(1968) Peritubular control of Proximal tubular fluid reabsorption in the rat kidney. Am. J. Physiol; 214: pg.no 943-954*
3. *Furaman BL (1970) Diuretic induced hypoglycemia in mouse Ph.D Thesis. University of Bradford pg.no 81-90*
4. *Wellmann KF and Volk BW (1971) Renal lession in experimental hypercholesterolemia in normal and in subdiabetic rabbits.II long term studies. Lab. Invs.t;24: pg. no.144-155*
5. *Nishikawa K and Kikuchi S (1973) Involvement of adrenergic mechanism in diuretic action of O-chlorobenzyle methyl sulfoxide in rat. Jpn. J. Pharmacol.: 23(2) : pg. no. 177-182*
6. *Purkerson ML , Hoffsten PE and Klahr S(1976) Pathogenesis of glomerulopathy associated with renal infraction in rats. Kidney Int.: 9 :pg no 407-417*
7. *Gluck Z, Weidmann and Mordasini R (1978) Increased ratio between serum β, α-lipoproteins during diuretic therapy . Clin. Sci. Med.:55 ;325-328*
8. *Arthur G (2000) Diuretic complications Am. J. Med. Sci.;319:pg no.10-24*
9. *Maheshwari M (2002) Biochemical changes in testies and kidney of Albino rat after treatment of diuretic drug compound acetazolomide . M.Phil Dessertation. Dr. BRA University, Agra*
10. *Maheshwari M (2004) Combined impacy of antihypertensive drug agent β- blockers and hydrochlorothiazide drug compound on the biochemical parametes and histo_ Architecture of certain tissues of albino rat. Ph.D thesis. Dr. BRA University, Agra*
11. *Singh PK and Maheshwari M (2005) Impact of acetazolamide on testicular biochemistry of albino rat. J. Ecophsiol. Occup. Hlth.; 5 :pg no. 5-7*
12. *Su XH, Duen r, Sun YY, Kang DG, Lee HS and Jin SN (2014) cardiovascular effects of ethanol extract of Rubus cingil Hu (Rosaceae) in rats: an in vivo and vitro approach. J. Physiol. Pharmacol. ;65(3):pg.no. 417-424*
13. *Prieto I, Villarejo AB, Segara AB, Wangesteen R and Ramirez-Sanchhez M(2016) brain heart, kidney correlate for the control of blood pressure and water balance : role of angiotensinases.Neuroendocrinology; 103(6): pg.no. 826-829*
14. *Zal F, Taheri R, Khadmi F, Rajabi S(2014) The combined effect of furasemide and propranolol on GSH homeostasis on ACHN renal cell.J, Physiol. Pharmacol.: 65(3); pg.no.417-424*
15. *Frindt G, Yang L, Uchida S, Weinstein AM, Palmer LG (2017)Responses of distal nephron Na+ transporters to acute volume depletion and hyperkalemia.*Am. J. Physiol. Renal ..Physiol.*:313(1):pg.no. 62-73.*
16. *De Almeida CLB, Cechinel-Filho V, Boeing T, Mariano LNB, Silva LMD, Andrade SF, De Souza P(2018) Prolonged diuretic and saluretic effect of nothofagin isolated from Leandra dasytricha (A. Gray) Cogn. leaves in normotensive and hypertensive rats: Role of antioxidant system and renal protection. Chem. Biol. Interact ; 279(5):pg.no.227-233*