Original Article

Influence of Celecoxib on Serum Urea Alongwith Favorable Effects of Lycopene on Albino Rats; An Investigational Study

Sadia Sundus[1], Ashok Kumar[3], Ata-ur-Rehman[5], Neelam Mallick[2], Muhammad Imran[2] and Ali Nawaz Bijarani[4]

ABSTRACT

Objective: To evaluate the influence of celecoxib on serum urea along with enhancement by lycopene.
Study Design: Investigational Study
Place and Duration of Study: This study was conducted at the Animal House of BMSI, JPMC, Karachi from May, 4th May 2016 to 3rd June 2016.
Materials and Methods: Physically fit forty adult male Albino rats of 200-220gm and 90-120 days old were taken for this study and distributed into 4 groups, control group was chosen as Group1A, In Group 1B Celecoxib was given 50 mg/kg orally, In Group 1C Celecoxib was given 50 mg/kg with lycopene50 mg/kg orally and In Group 1D lycopene was given 50 mg/kg orally for 30 days. At accomplishment of study, animals were sacrifice and tissues were preserved for staining.
Results: In Group 1B serum urea was markedly raised, however serum level were amended in Group 1c which were given celecoxib with lycopene.
Conclusion: This study reveals that lycopene amended the serum deviations of Group 1B.
Key Words: Celebrex, nephroprotective, chemoprotective, PGE

Citation of article: Sundus S, Kumar A, Ata-ur-Rehman, Mallick N, Imran M, Bijarani AN. Influence of Celecoxib on Serum Urea Alongwith Favorable Effects of Lycopene on Albino Rats; An Investigational Study. Med Forum 2021;32(10):159-161.

INTRODUCTION

NSAIDs epitomize utmost common medications used globally. NSAIDs has anti-inflammatory, analgesic and antipyretic properties by subdual synthesis of prostaglandin (PG), through preventing the cyclooxygenase enzyme.[1,2] COX-2 inhibitor like Celecoxib, probably decreases GI adversative outcomes, but it had a possibility of cardiovascular and renal side effects, because in kidney PGE2 shows an important role in hemodynamics and metabolism of fluid.[3-6] It augmented the autophagy and antioxidant indicators.[7]

1. Department of Anatomy / Pharmacy[2], Iqra University, Karachi.
3. Department of Anatomy / Pharmacology[4], Shaheed Mohtrmma Benazir Bhutto Medical College, Lyari.
5. Department of Pharmacology, Hamdard College of Medicine & Dentistry, Karachi.

Correspondence: Dr. Sadia Sundus, Associate Professor of Anatomy, Iqra University, Karachi.
Contact No: 0300-2850489
Email: usadsun_dr@yahoo.com

Received: April, 2021
Accepted: July, 2021
Printed: October, 2021

Prolonged usage of COX-2 inhibitors aggravate the raise in BP. COX-2 is the stimulator of PGE2 which is liable for conservation of renal function and arachidonic acid production and plays an inflammatory role. PGE2 raises progression, intrusiveness and metastasis of a malignant tumor, while prevents apoptosis and angiogenesis. Celebrex is a discriminatory COX-2 inhibitor so that it abrogate the PGE2 production and act as a tumor marker.[8,9]
Lycopene is the utmost copious and actual singlet-oxygen quencher and member of fat-soluble pigments as well as natural tomato carotenoids, which act prophylactically against proteins, lipids and DNA oxidation by scavenging free radicals due to its double bonds by direct in vivo reaction and neutralization. It is existent in red fruits and vegetables.[10-12] Instantaneous usage of antioxidant compounds can intrude in chemotherapy and malignancy management.[13] It reveals significant nephroprotective and chemoprotective properties.[14,15] It is present in LDL and VLDL of human plasma due to lipophilic nature, so shows itself as an anti- carcinogenic agent and should use after chemotherapy.[16-19] Lycopene has numerous properties like anti-inflammatory, antioxidant, anti-fibrotic and anti-apoptotic agent.[20-22]
In the intervening period, we didn't notice investigational study about influence of celecoxib on serum urea along with favorable effects of lycopene on albino rats therefore this opportunity is taken to initiate

this experimental work and compare the consequences with prior studies.

MATERIALS AND METHODS

A 30 days research work was accomplished on forty adult male albino rats indiscriminately allocated into four sets and were kept in pellet of BMSI animal house for seven days under observation. Three sets were administer Celebrex through gavage and one set was administer lycopene only. Assessment of serum BUN was carried by kit.

I: Control
II: Celebrex 50 mg/kg gavage. (Diseased group)
III: Celebrex with lycopene 50 mg/kg gavage.
IV: Lycopene 50 mg/kg gavage.

Throughout the entire research time animals were intensely observed for dissimilarity in their overall wellbeing. Blood serum samples were taken by direct cardiac puncture for the analyses of BUN renal function test by automated analyzer. To detect the serum urea levels, blood samples were processed in the DUHS laboratory Karachi Pakistan; where samples were centrifuged to separate the serum. Urea nitrogen levels were determined by spectrophotometric technique on Architect c 7D75 analyzer. Urea nitrogen estimation was performed Total Lab. Automation (TLA). The Kit used was Cat No. 7D75-21 and 7D75-31 reagent kits for serum Urea nitrogen SPSS version 20 were used for evaluation.

RESULTS

I: set I animals were remained in their best of wellbeing their dietary habits and response to Stimuli were adequate till the end of research. The mean value of serum urea level was 19.9±0.15. (Table-1, Figure1)

Table No.1: Mean Value of Serum Urea (Mg/Dl) in Various Sets of Albino Rats

Sets	Treatment given	Serum enzyme level urea
I (n=10)	ND	19.9±0.15
II (n=10)	Celebrex	51.60±0.49
III(n=10)	Celebrex + Lycopene	20.09±0.16

***Mean±SEM**

Numerical investigation of the variance in the mean serum level of urea among sets of Albino rats.

Numerical investigation	P-value
II vs. I	P<0.001****
III vs. I	P>0.05*
III vs. II	P<0.001****

Key:Non-significant* Significant**
Moderately significant* Highly significant******

II: Set II animals were perceived ill, lazy and inactive. Their diet became lessen and response was slothful. The mean value of serum urea in set II was 51.60±0.49. A very substantial raise (P<0.001) was detected in the mean value of serum urea level of set II, as compare to set I. (Table-1, Figure1)

III: Set III animals looked comparatively thriving, active as compare to II. Their food intake were habitual. The mean value of serum urea in set III was 20.09±0.16. A slight raise (P>0.05) was detected in mean value of urea level of set III, as compare to set I, while a very substantial decline (P<0.001) in the mean value of serum urea level was detected in set III, when it was compared with set II.(Table-1, Figure1)

IV: The results of set IV were similar to set I.

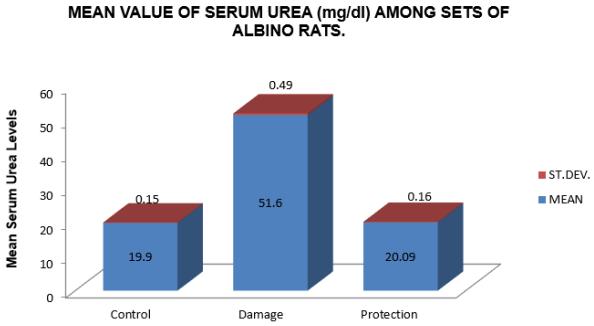

Figure No.1: Mean Value of Serum Urea (Mg/Dl) Among Sets of Albino Rats

DISCUSSION

NSAIDs epitomize the commonest prescribed and extremely efficient drug used internationally, in various diseases due to its anti- inflammatory, antipyretic, and palliative propertie[s.1,2] Celebrex is the key members of the selective COXII enzyme inhibitor group and helps in decreasing postoperative throbbing discomfort just like morphine, pethidine, and NSAIDs.[6]

Lycopene is the most effective antioxidant, which belongs to carotenoids family. It is present in red fruits, vegetables and tomato-rich products. It reduces the hazard of microbes, so it acts prophylactically as antioxidative agent, antiapoptotic agent, radical scavenging, and chelating agents.[10,12,15]

Set II animals exhibited a very substantial raise in the serum urea. Analogous effects were also expounded by.[1,5]

In set III animals a very substantial decline in the serum urea level was detected. Analogous effects were also expounded by.[10,19]

CONCLUSION

Experimentation determined that set II animals had raised serum levels of urea while III animals showed reduction in serum levels of urea as compared to II. So our interpretation from this study is that don't use celecoxib routinely and if required avoid using it without lycopene, in order to reduce its disadvantages.

Author's Contribution:
Concept & Design of Study: Sadia Sundus
Drafting: Ashok Kumar,

	Ata-ur-Reman
Data Analysis:	Neelam Mallick, Muhammad Imran, Ali Nawaz Bijarani
Revisiting Critically:	Ashok Kumar, Sadia Sundus
Final Approval of version:	Sadia Sundus

Conflict of Interest: The study has no conflict of interest to declare by any author.

REFERENCES

1. Sivaraj R, Umarani S. Diclofenac-induced biochemical changes in nephrotoxicity among male Albino rats. Int J Basic Clin Pharmacol 2018; 7:640-3.
2. Cooper DL, Murrell DE, Conder CM, Palau VE, Campbell GE, Lynch SP, et al. Exacerbation of Celecoxib-Induced Renal Injury by Concomitant Administration of Misoprostol in Rats. PLoS ONE 2014;9(2):e89087.
3. Shin S. Safety of celecoxib versus traditional nonsteroidal anti-inflammatory drugs in older patients with arthritis. J Pain Res 2018;11:3211–3219.
4. Huang H, Luo M, Liang H, Pan J, Yang W, Zeng L, et al. Pain Medicine 2020;1–12.
5. Harirforoosh S, West KO, Murrell DE, Denham JW, Panus PC, Hanley GA. Assessment of celecoxib poly(lactic-co-glycolic) acid nano-formulation on drug pharmacodynamics and pharmacokinetics in rats. European Review for Medical and Pharmacological Sciences 2016;20: 4818-4829.
6. Vahabi S, Karimi A, Beiranvand S, Moradkhani M, Hassanvand K. Comparison of the Effect of Different Dosages of Celecoxib on Reducing Pain after Cystocele and Rectocele Repair Surgery. Open Anesthesia J 2020;11:30-34.
7. Okamoto K, Saito Y, Narumi K, Furugen A, KenIseki, Kobayashi M. Comparison of the nephroprotective effects of non-steroidal anti-inflammatory drugs on cisplatin-induced nephrotoxicity in vitro and in vivo. Eur J Pharmacol 2020;884:173339.
8. Luo L, Liang Y, Ding X, Ma X, Zhang G, Sun L. Significance of cyclooxygenase-2, prostaglandin E2 and CD133 levels in sunitinib-resistant renal cell carcinoma. Metrics 2019;1442-1450.
9. Al-Saffar FJ. Effect on renal histology and renal metabolizing enzymes and oxidative stress biomarkers in rats administered zerumbone against experimental osteoarthritis. Asian J Cell Biol 2015; 10 (3): 66-79.
10. Bayomy NA, Elbakary RH, Ibrahim MAA, Eman Abdelaziz Z. Effect of Lycopene and Rosmarinic Acid on Gentamicin Induced Renal Cortical Oxidative Stress, Apoptosis, and Autophagy in Adult Male Albino Rat. Anatomical Record 2017; 300:1137–1149.
11. Mohamed A, Dina S, Shaer F. Lycopene protects against renal cortical damage induced by nandrolone decanoate in adult male rats. Annals of Anatomy Anatomischer Anzeiger 2019;7(224): 142-152.
12. Rasheed HA, Al-Naimi MS, Hussien NR, Al-Harchan NA, Al-Kuraishy HM, Al-Gareeb AI. New insight into the effect of lycopene on the oxidative stress in acute kidney injury. Int J Crit Illn Inj Sci 2020;10(1):11–16.
13. Mahmoodnia L, Mohammadi K, Masumi R. Ameliorative effect of lycopene effect on cisplatin-induced nephropathy in patients. J Nephropathol 2017;6(3):144-149.
14. Lin J, Xia J, Zhao HS, Hou R, Talukder M, Lei Yu, et al**.** Lycopene Triggers Nrf2–AMPK Cross Talk to Alleviate Atrazine-Induced Nephrotoxicity in Mice. J Agric Food Chem 2018;66(46): 12385–12394.
15. Yu K, Zhang J, Cao Z, Qiang Ji, Han Y, Song M, et al. Lycopene attenuates AFB_1-induced renal injury with the activation of the Nrf2 antioxidant signaling pathway in mice. Food & Function 2018;(12):122-126.
16. Ibrahim SS, Said AM. Effect of Lycopene In Amelioration Of Testicular And Renal Toxicity Induced By Boldenone Undecylenate In Male Albino Rats. Int J Med Biomed Studies 2019;3(3): 58-66.
17. Patil AA, Doijad R, Koparde A. Renoprotective effect of Lycopene on Renal Functional and Histopathological changes in Gentamycin Induced Nephrotoxicity in Rats. Research J Pharm Tech 2020;13(7): 3237-3240.
18. JunXiaa, JiaLina, Xue-NanLia, CongZhanga, NanLiab, Zheng-Hai, et al. Atrazine-induced environmental nephrosis was mitigated by lycopene via modulating nuclear xenobiotic receptors-mediated response. J Nutritional Biochemis 2018;1(51):80-90.
19. Elkarim DG. Presumptive Ameliorative Effect of Lycopene on Lead-induced Nephrotoxicity in Males Wistar Rats. J Advanced Veterinary Res 2019;9(3): 91-96.
20. Yi Zhao, Mu-Zi Li, Yue Shen, Jia Lin, Hao-Ran Wan, et al. Lycopene Prevents DEHP-Induced Leydig Cell Damage with the Nrf2 Antioxidant Signaling Pathway in Mice. J Agric Food Chem 2020;68(7):2031–2040.
21. Santoso HS, Lestari S, Prayogo L, Kamsinah, Rochmatino. Renoprotective Effects of Lycopene in Tomato Extracts on Rat Exposed to Cadmium. Earth and Environmental Sci 2020;593-597.
22. Hussein SA, Azab M, Ahmed TE, Amin A, Abu Eldahab MMM. Cytoprotective, anti-apoptotic and anti-inflammatory effects of lycopene against mercuric chloride-induced hepatorenal injury in rats: Involvement of TNF-α/ NF-κβ/ and p53 signaling pathways. Benha Veterinary Med J 2019; 37(2):14-22.