CODEN [USA]: IAJPBB ISSN: 2349-7750

INDO AMERICAN JOURNAL OF
PHARMACEUTICAL SCIENCES

http://doi.org/10.5281/zenodo.3345024

Available online at: http://www.iajps.com ***Research Article***

PREVALANCE OF LIPID PROFILE AND LIPID PEROXIDATION STATUS IN SCHIZOPHRENIC PATIENTS RECEIVING ANTI-PSYCHOTIC DRUGS: A COMPARATIVE STUDY FROM LAHORE-PAKISTAN

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Article Received: May 2019 **Accepted:** June 2019 **Published:** July 2019

Abstract:

Background: *Dopaminergic movement in the prefrontal cortex are related with the shortfall side effects and psychological impedance of schizophrenia and that expanded action in the sub cortex is related with the insane manifestations of schizophrenia. A partial employment of glutamatergic transmission in oxytocin mediated choking of dopaminergic psycho stimulant induced practices has in like manner been proposed.*

Objective: *To determine the Lipid Peroxidation status in schizophrenic patients receiving anti-psychotic drugs.* ***Methodology:*** *Comparative Study. Fourty patients of Schizophrenia and Fourty age and sex-matched healthy individuals were eligible for inclusion in the study at Mental Hospital Lahore. 5.0 ml blood sample was taken from each individual and subjected to centrifuge at 3500-4500 rpm for 10-15 minutes for the separation of serum. Oxidative stress biomarkers (NO, MDA, AOPP and AGE's) and serum electrolyte profile, Serum LFT's, Serum RFT's and serum Lipid Profile were estimated.*

Results: ***NO*** *level in schizophrenic patients is (0.17 ± 0.10), while* ***NO*** *level in sound people (12.3±2.05) Data also shows that NO is significant statistically (P = 0.000<0.05).* ***MDA*** *level in schizophrenic patients is (0.23±0.08), while* ***MDA*** *level in healthy individuals (1.27±0.28). Information additionally demonstrates that* ***MDA*** *is critical factually (P = 0.000<0.05).* Na^+ *level in schizophrenic patient's is (78.93±59.46), while* Na^+ *level in healthy persons (141.5±2.05). Data other than presentations that* Na^+ *is key truly (P = 0.000<0.05).*

Conclusion: *Present study concluded that serum total protein, sodium (Na^+), NO, AGE,s and AOPP level declined remarkably which is the cause for the progression of disease.*

Key Words: *NO, MDA, AGE's, AOPP, Lipid Peroxidation.*

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Please cite this article in press Hafiz Muhammad Arsalan et al., ***Prevalance Of Lipid Profile And Lipid Peroxidation Status In Schizophrenic Patients Receiving Anti-Psychotic Drugs: A Comparative Study From Lahore-Pakistan,.,*** *Indo Am. J. P. Sci, 2019; 06(07).*

INTRODUCTION:

The malady schizophrenia, perceived in round 0.5-1.0% of the people sooner or later of their ways of life time (1), can be viewed as the terrible last outcomes division of a plainly 'confused', multidimensional maniacal disorder lifetime rate 2–three% (2), that thus can be followed to quantifiable, age-built up (more youthful, old) articulation of lawful obligation in a huge rate around 10–20% (3), of the non-wiped out well known masses (4). The related manifestation measurements of the crazy disorder are: psychosis (mind flights and dreams), persuasive weakness (volition or an inspiration), emotional dysregulation (gloom, lunacy) and changes in information preparing (psychological disability).

Un-necessary heritability appraisals demonstrate a solid hereditary effect. Not with standing the way that the notable 'strain-weakness' adaptation of etiological affect in psychiatry accept that hereditary components work by making individuals specifically helpless for natural dangers (quality surroundings communication, or GxE), it has demonstrated extreme to give information substantiating this supposition. Nonetheless, current proof of sizable variety inside the predominance all through areas and minority gatherings, identified with over the top inferable division (5).

Dopaminergic movement in the prefrontal cortex are related with the shortfall side effects and psychological impedance of schizophrenia and that expanded action in the sub cortex is related with the insane manifestations of schizophrenia (6). The level of dopamine discharge following amphetamine organization is related with exacerbating of crazy side effects because of the amphetamine in these examinations. These outcomes propose that in patients with intense schizophrenia, invigorated dopamine discharge is more noteworthy than in typical examination subjects, and this might be related with their intense psychosis. Later outcomes estimating basal dopaminergic movement by utilizing alpha-methyl-Para tyrosine to drain accessible dopamine and estimating increments in raclopride after organization of alpha-methyl-Para tyrosine propose that basal dopaminergic action is correspondingly expanded in patients with schizophrenia and is in fact related with the degree of amphetamine-animated discharge. Interestingly, in an investigation of patients with schizotypal character issue utilizing the IBZM SPECT worldview, IBZM uprooting after amphetamine organization in schizotypal character issue was altogether not as much as that saw in patients with schizophrenia, in spite of the fact that it was unobtrusively however fundamentally higher than that of ordinary examination subjects (7).

The beginning of the formal side effects of schizophrenia is for the most part gone before by a prodromal stage. Purported prodromal manifestations and practices (i.e., those that messenger the moving toward beginning of the sickness) incorporate constricted positive side effects (i.e., figments, thoughts of reference, supernatural reasoning, and super stitiousness), state of mind side effects (i.e., nervousness, dysphoria, and fractiousness), intellectual side effects (i.e., distractibility, focus troubles), social withdrawal, or fanatical practices to give some examples (8). Oxytocin has been found to decrease dopamine release in the center accumbens and to lessen loco motor responses following cocaine association (9). Likewise, oxytocin reduces cocaine-prompted stereotyped practices in a bit subordinate manner (10). Similarly, after intracerebral association of oxytocin in rodents, methamphetamine-incited hyperactivity reduces (11) and methamphetamine-subordinate practices are canceled (12). A partial employment of glutamatergic transmission in oxytocin mediated choking of dopaminergic psych stimulant induced practices has in like manner been proposed (13). As needs be, oxytocin and dopamine appear to eagerly interface with control adaptable responses to environmental enhancements related with social direct planning and explanations

Objective:

The objective of present study was to determine the Lipid peroxidation and lipid profile status in schizophrenic patients.

METHODOLOGY:

Place of Work:

The whole experimental work was done in the Biochemistry Lab, School of Biochemistry and Medical Lab Technology, Faculty of Allied Health Sciences, Minhaj University Lahore after the approval of Ethical and Research Committee, Minhaj University Lahore.

Study Design:

Whole study was divided into two groups i.e. 1st group A consist of Healthy individuals (Control) and 2nd group B Consist of patients.

Sr.No	Group	Sample Size (n)
A	Healthy (Control Group)	40
B	Schizophrenia (Diseased)	40

Blood/Data Collection:
5.0 ml venous blood samples of 40 Schizophrenic patients and 40 Blood samples of Healthy individuals were taken in clotted gel vial from Institute of Mental Health, Mental Hospital Lahore. Blood was further processed for the estimation of Malondialdehyde (MDA), Estimation of Nitric oxide (NO), Estimation of AOPPs, Estimation of AGEs, Estimation of urea and creatinine, Liver functions tests, total proteins, serum Albumin, Lipid profile and Electrolytes concentration by flame photometer (Na^+ and K^+) by kit method.

Blood/Sample Analysis:
Blood was centrifuged at 4000 rpm for 10 minutes and serum was separated. Blood sample was collected into EDTA tubes or gel clotted vials.

MDA was measured by spectrophotometric method of Ohkawa *et al.*, (1979).
Nitrite concentration is typically measured by a well-known method such as colorimetric Griess assay (Moshage *et al.*, 1995).

RESULTS:

TABLE NO 1	**ANTIOXIDANTS STATUS BETWEEN SCHIZOPHRENIC AND CONTROL PERSONS**

VARIABLES	**CONTROL (n=40) (Mean ± S.D)**	**SUBJECTS (n=40) (Mean ± S.D)**	**P<0.05**
NO (µM)	12.3±2.05	0.17 ± 0.10	0.000
MDA (µmol/L)	1.27±0.28	0.23 ± 0.08	0.000
AOPP (µmol/L)	2.05±0.35	0.36±0.08	0.000
AGEs (mU/ml)	4.37±1.21	0.14 ± 0.10	0.000

The information exhibited in table 1 and figure 1 demonstrated the serum Nitric Oxide (**NO)** level in schizophrenic patients. **NO** level in schizophrenic patients is (0.17 ± 0.10), while **NO** level in sound people (12.3±2.05) Information demonstrates that **NO** level in schizophrenic patient's decreased surprisingly and noteworthy factually. Data also shows that NO is significant statistically (P = 0.000<0.05). Serum **MDA** level in schizophrenic patients. **MDA** level in schizophrenic patients is (0.23±0.08), while **MDA** level in healthy individuals (1.27±0.28). Data shows that **MDA** level in schizophrenic patient's decreased remarkably and significant statistically. Information additionally demonstrates that **MDA** is critical factually (P = 0.000<0.05). Serum **AOPP** dimension in schizophrenic patients. **AOPP** dimension in schizophrenic patients is (0.36 ± 0.08), while **AOPP** dimension in sound individuals (2.05±0.35) Information exhibits that **AOPP** dimension in schizophrenic patient's decreased shockingly and vital genuinely. Data furthermore exhibits that **AOPP** is basic authentically (P = 0.000<0.05). The serum **AGEs** measurement in schizophrenic patients.

Information demonstrates that **AGEs** measurement in schizophrenic patients is (0.14 ± 0.10), while **AGEs** measurement in sound people (4.37±1.21) Information shows that **AGEs** measurement in schizophrenic patient's decreased amazingly and crucial truly. Information moreover displays that **AOPP** is essential genuinely (P = 0.000<0.05).

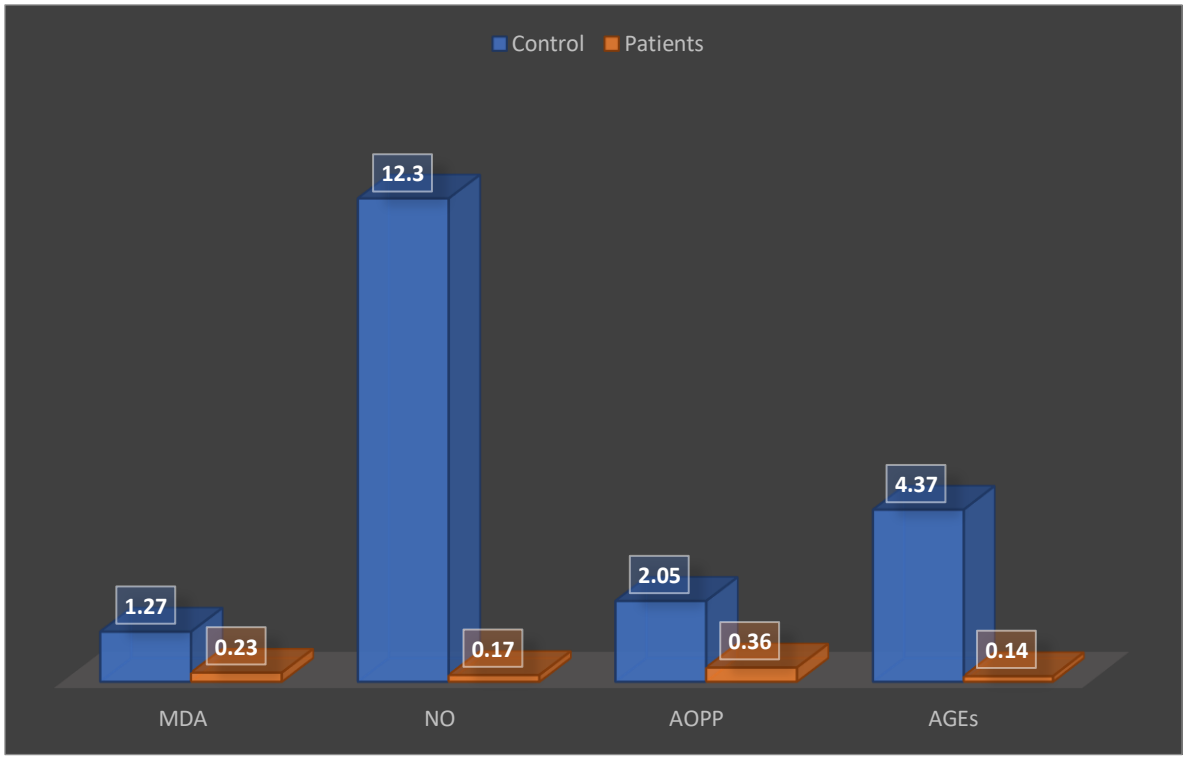

Figure 1: Graphical Representation of Antioxidants Status between Schizophrenic and Control Persons

TABLE NO 2	**DIFFERENT PROFILE'S STATUS IN SCHIZOPHRENIC AND HEALTHY INDIVIDUALS**

VARIABLES	**CONTROL (n=40) (Mean ± S.D)**	**SUBJECTS (n=40) (Mean ± S.D)**	**P<0.05**
CRP (mg/L)	6.0±1.10	0.00±0.00	0.000
UREA (mg/dL)	5.6±1.01	11.53 ± 15.02	0.000
CREATININE (mg/dL)	1.4±0.21	0.33 ± 0.56	0.003
TBIL (mg/dL)	1.2±0.1	0.15 ± 0.10	0.000
Na^+ (mEq/L)	141.5±2.05	78.93±59.46	0.000
K^+ (mEq/L)	1.27±0.28	3.75 ± 3.63	0.000

ALB (g/dL)	5.5±0.62	0.55 ± 0.71	0.000
CHOL (mg/dL)	190.52±1.03	260.73 ± 33.71	0.002
TG (mg/dL)	150.0±9.23	26.39 ± 43.05	0.002
CL^- (mEq/L)	102.5±4.69	76.13 ± 55.45	0.000
T.P (g/dL)	8.5±0.99	0.56 ± 1.19	0.016

The data illustrated in table and figure 2 expressed the serum CRP level in schizophrenic patients. CRP level in schizophrenic patient's is (0.00±0.00), while **CRP** level in healthy human (6.0±1.10). Data shows that **CRP** level in schizophrenic patients decreased unusually and expressive statistically. Data besides shows that **CRP** is fundamental truly (P = 0.000<0.05). The information delineated in above table communicated the serum **urea** level in schizophrenic patients. **UREA** level in schizophrenic patient's is (11.53 ± 15.02), while **UREA** level in sound human (5.6±1.01). Information demonstrates that **urea** level in schizophrenic patient's increased unusually and expressive measurably. Information other than demonstrates that **UREA** is basic genuinely (P = 0.000<0.05). The serum **creatinine** level in schizophrenic patients. Creatinine level in schizophrenic patients is (0.33 ± 0.56), while **Creatinine** level in healthy volunteers (1.4±0.21). **Creatinine** level in schizophrenic patient's increased unusually and consequential quantifiably. Data other than exhibits that **Creatinine** is fundamental truly (P = 0.003<0.05).

The information laid out in table 2 passed on the serum **TBIL** level in schizophrenic patients. **TBIL** level in schizophrenic patient's is (0.15 ± 0.10), while **TBIL** level in sound human (1.2±0.1). Information shows that **TBIL** level in schizophrenic patients expanded unusually and expressive quantifiably. Information other than displays that **TBIL** is key really (P = 0.000<0.05). Serum **Na^+** level in schizophrenic patient's .Data shows that **Na^+** level in schizophrenic patient's is (78.93±59.46), while **Na^+** level in healthy persons (141.5±2.05). Data inform that **Na^+** level in schizophrenic patient's increased remarkably and significant statistically. Data other than presentations that **Na^+** is key truly (P = 0.000<0.05). The data presented in table 2 display the serum potassium **(K^+)** level in schizophrenic patient's. Data display that **K^+** level in schizophrenic patients is (3.75 ± 3.63), while **K^+** level in healthy person (1.27±0.28). Data display that **K^+** level in schizophrenic patient's decreased exceptionally and unusual statistically. Information other than introductions that **K^+** is key really (P = 0.000<0.05).

Serum **ALB** level in schizophrenic patients. **ALB** level in schizophrenic patient's is (0.55 ± 0.71), while **ALB** level in healthy somebody (5.5±0.62). Data demonstrates that **ALB** level in schizophrenic patient's extended unusually and important statistically. Data other than presentations that NO is key truly (P = 0.000<0.05). The information spread out in table 2 passed on the serum **CHOL** level in schizophrenic patients. Data shows that **CHOL** level in schizophrenic patients are (260.73 ± 33.71), while **CHOL** level in sound someone (190.52±1.03). Information shows that **CHOL** level in schizophrenic patients multiplied unusually and significant factually. Information other than introductions that **CHOL** is key genuinely (P = 0.002<0.05). Serum **TG** level in schizophrenic patients. Information demonstrate that **TG** level in schizophrenic patient's is (26.39 ± 43.05), while **TG** level in sound somebody (150.0±9.23). Data demonstrates that **TG** level in schizophrenic patient's duplicated unusually and critical authentically. Data other than presentations that **TG** is key truly (P = 0.002<0.05). Serum **CL^-** level in schizophrenic patients. Data exhibit that **CL^-** level in schizophrenic patients is (26.39 ± 43.05), while **CL^-** level in sound someone (150.0±9.23). Information exhibits that **CL^-** level in schizophrenic patient's copied unusually and basic legitimately. Information other than introductions that **CL^-** is key really (P = 0.000<0.05). The data spread out in table 2 exhibited the serum **T.P** level in schizophrenic patients. Information show that **T.P** level in schizophrenic patients is (0.56 ± 1.19), while **T.P** level in sound somebody (8.5±0.99). Data displays that **T.P** level in schizophrenic patient's replicated unusually and fundamental genuinely. Information other than introductions that **T.P** is key really (P = 0.016<0.05).

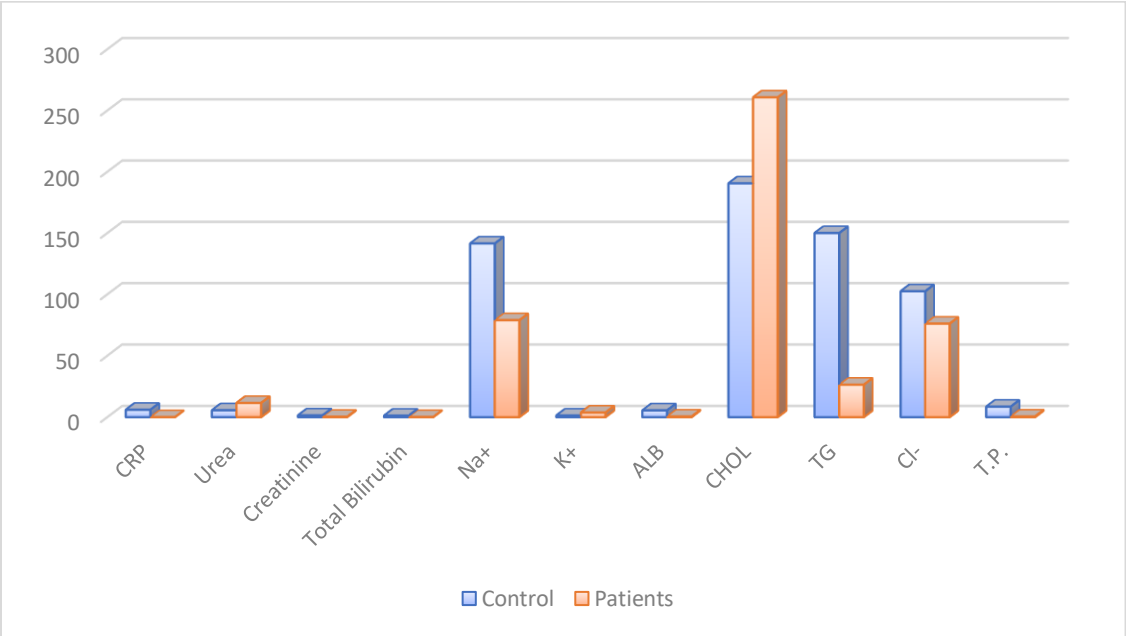

Figure 2: Different Profile's Status in Schizophrenic and Healthy Individuals

TABLE NO 3	**SPEARMAN Correlation table Between different biomarkers in Schizophrenic Patients receiving anti-psychotic drugs**

Parameter	**Correlation (r)**	**p-value**
Nitric Oxide vs Urea	0.433*	0.017
Nitric Oxide vs Creatinine	0.366*	0.047
AGE's vs Sodium	0.361*	0.050
Urea vs Creatinine	0.769**	0.000
Urea vs Total Bilirubin	0.494**	0.006
Urea vs Sodium	0.454*	0.012
Urea vs Albumin	0.861**	0.000
Urea vs Cholesterol	0.874**	0.000
Urea vs Triglyceride	0.585**	0.001
Urea vs Total protein	0.759**	0.000
Creatinine vs Total bilirubin	0.438*	0.015
Creatinine vs albumin	0.586**	0.001
Ceatinine vs cholesterol	0.815**	0.000
Creatinine vs Triglyceride	0.791**	0.000
Creatinine vs Total protein	0.540**	0.002
Total Bilirubin vs Cholesterol	0.369*	0.045

Total Bilirubin vs Total protein	0.388*	0.034
Sodium vs Albumin	0.458*	0.011
Sodium vs Cholesterol	0.411*	0.024
Sodium vs Chloride	0.809**	0.000
Albumin vs Cholesterol	0.878**	0.000
Albumin vs Triglyceride	0.577**	0.001
Albumin vs Total Protein	0.618**	0.000
Cholesterol vs Triglyceride	0.762**	0.000
Cholesterol vs Total Protein	0.700**	0.000

*. Correlation is significant at the 0.05 level (2-tailed).
**. Correlation is significant at the 0.01level (2-tailed).

DISCUSSION:

Schizophrenia is a psychological issue that typically shows up in late youth or early adulthood. Described by fancies, visualizations, and other intellectual troubles, schizophrenia can frequently be a deep rooted battle. Schizophrenia most normally strikes between the ages of 16 and 30, and guys will in general show side effects at a somewhat more youthful age than females. By and large, the turmoil grows so gradually that the individual does not realize that they have had it for a long time. Notwithstanding, in different cases, it can strike all of a sudden and grow rapidly.

Specialists accept that an awkwardness of dopamine, a synapse, is engaged with the beginning of schizophrenia. Different synapses, for example, serotonin, may likewise be included. Restorative treatment and mental help can be viable, however even with this assistance; dealing with one's way on the planet with such an incapacitating weight can make it difficult to pick up capabilities, hold down an occupation, and have a gainful existence. Antipsychotic prescriptions are generally taken every day in pill or fluid structure. A few antipsychotics are infusions that are given on more than one occasion per month. A few people have reactions when they begin taking prescriptions, yet most symptoms leave following a couple of days. Specialists and patients can cooperate to locate the best drug or medicine blend, and the correct portion. Modern data taking drugs use and symptoms can be found on the U.S. Sustenance and Medication Organization (FDA) site, including the most recent data on alerts, quiet drug aides, or recently endorsed prescriptions.

Data presented in table 3 shown the spearman correlation between different biomarkers in schizophrenic patients receiving antipsychotic drugs. Table showed that positive correlation exist between **NO** and **UREA (r= 0.433*, P=0.017<0.05).**

Table demonstrated that positive correlation exist between **nitric oxide** and **creatinine (r= 0.366*, P=0.047<0.05).**
Tabulation displayed that positive correlation survive between **AGEs** and **sodium (r= 0.361*, P=0.050<0.05).**
Table illustrate that strong positive correlation occur between **UREA** and **CREATININE (r= 0.769**, P=0.000<0.05).**
Table represents that solid positive relationship happen among **UREA** and **Total bilirubin (r= 0.494**, P=0.006<0.05).**
Table speak to that positive relationship occur among **UREA** and **SODIUM (r= 0.454*, P=0.012<0.05).**
Table address that strong positive interaction happen among **UREA** and **ALBUMIN (r=0.861**, P=0.000<0.05).**
Table location that strong positive relationship occur among **UREA** and **CHOLESTERL (r= 0.874**, P=0.000<0.05).**
Table area that strong positive interrelationship happen among **UREA** and **TRIGLYCERIDE (r= 0.585**, P=0.001<0.05).**
Table territory that positive connection prevail among **UREA** and **Total Protein (r = 0.759**, P=0.000<0.05).**
Table domain that positive relationship happen among **Creatinine** and **Nitric Oxide (r = 0.366*, P=0.047<0.05).**

Table area that strong positive association appear among **Creatinine** and **Urea (r = 0.769**, P=0.000<0.05).**
Table demonstrated that positive correlation exist between **Creatinine** and **Total bilirubin (r = 0.438*, P=0.015<0.05).**
Table location that solid positive association occur among **Creatinine** and **albumin (r = 0.586**, P=0.001<0.05)**
Table area that strong positive affiliation happen among **Ceatinine** and **cholesterol (r = 0.815**, P=0.000<0.05).**
Table territory that solid positive connection occur among **Creatinine** and **Triglyceride (r = 0.791**, P=0.000<0.05).**
Table domain that strong positive association happen among **Creatinine** and **Total protein (r = 0.540**, P=0.002<0.05).**
Table space that positive affiliation occur among **Total Bilirubin** and **Cholesterol (r = 0.369*, P=0.045<0.05)**.
Table area that positive affiliation occur among **Total Bilirubin** and **Total protein (r = 0.388*, P=0.034<0.05).**
Table region that positive alliance happen among **Sodium** and **Albumin (r = 0.458*, P=0.011<0.05).**
Table district that positive union occur among **Sodium** and **Cholesterol (r = 0.411*, P=0.024<0.05).**
Table region that strong positive association happen among **Sodium** and **Chloride (r = 0.809**, P=0.000<0.05).**
Table locale that powerful positive affiliation occur among **Albumin** and **Cholesterol (r = 0.878**, P=0.000<0.05).**
Table region that amazing positive connection happen among **Albumin** and **Triglyceride (r = 0.577**, P=0.001<0.05).**
Table district that astounding positive association occur among **Albumin** and **Total Protein (r = 0.618**, P=0.000<0.05).**
Table area that shocking positive affiliation happen among **Cholesterol** and **Triglyceride (r=0.762**, P=0.000<0.05).**
Table zone that stunning positive association occur among **Cholesterol** and **Total Protein (r = 0.700**, P=0.000<0.05).**

CONCLUSION:

Oxidative stress is key component involve in schizophrenia pathophysiology is growing evidence. It is predominantly deduced, the oxidative stress represent supreme importance. Present study has obviously shown elevated free radicals production and reduced antioxidant defense action that support the hypothesis of oxidative stress in schizophrenia. Present study concluded that serum total protein, sodium (Na^+), NO, AGE,s and AOPP level declined remarkably which is the cause for the progression of disease. Further studies demand which antioxidant, at which dosage and in which combination give positive result with least risk.

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