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INVESTIGATION OF PHARMACOLOGICAL ACTIVITY OF ZN-ASPIRIN METAL COMPLEX BY USING STREPTOZOCIN INDUCED DIABETES ON RAT MODELS

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ARTICLE INFO **ABSTRACT** **ORIGINAL RESEARCH ARTICLE**

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Cataracts are quite prevalent when we get older. In fact, more than half of all Americans aged 80 or older either had cataracts or had surgery to get rid of cataracts. It may not have noticed at first that a person has a cataract. But over time, cataracts can make your vision blurred, blurred, or less colorful creating difficulties in day to day activities. Also, it is found that cataract is one of the main leading reason of blindness and visual impairment in diabetic patients. Patients with DM are identified to be up to 5 times more likely to develop cataract, particularly at an early age. Due to the increasing prevalence of DM, the occurrence of diabetic cataracts has also increased. The present study aim to prepare and evaluate the effect of Zn-Aspirin Coordination Metal Complex on cataract and its anti-diabetic activity by Streptozotocin (STZ) induced diabetes in Wistar rat model.

INTRODUCTION

Cataract

Cataract is a worldwide disorder of eye which affected to the eye visibility just like a blindness. This affect all the age group of patients but in many study it is find that cataract affect the older age patients. In the case of children cataract affect 5% to 20% blindness worldwidly in many developing countries in the world[1]. Near about 15% to 20% of the blindness and cataract cases are seen in India and among these total number of cases of blindness most commonly observed in all over the India. This is occur due to very high prevalence rate of cataract cases in all India. When we compared the rate of prevalence of cataract in Western countries with India then find that the prevalence rate of cataract in India is much more than the western countries in all over the world. There are many factors are responsible for the cataract and blindness like environmental factors, nutritional factors and the genetic factors, are the main as important risk factors for blindness and cataract[2]. Blindness and cataract is the major and serious problem not in India but in all over the world, in India approximately 10 to 15 million of peoples are affected from this disorder. The prevalence of the cataract is increase as the rate of population of the countries, it is not stop with the time increase. Cataract is not a simple disease but it's a dangerous disease for all age patient groups, basically it increase with the

routine life style of the people and also with the diet habit of the populations.

In India cataract is most common disease in all age group patients as another countries. In the age of 70 to 80 year of the patients suffering from the cataract approximately 80 to 85%. Over the next 20 to 25 years, it is projected that in the world's population will be increased by around one third of the total population. It was evaluated that approximately 1.68 million of Australian people aged with 50-55 year were suffering by the age related cataract in year 2001 – 02 and this number projected to increase to approximately 2.75 to 2.80 million by near 2021 – 2022. Moreover, with time the cataract liquefies to convert a white fluid in the cataract, which can be form the severe inflammation if the lens capsule reputation. Worldwidly there are millions of population goes to blind from the cataract. It is also observed that in the African and Asian countries at least one to ten peoples per 1000 of population has to suffer every year with cataract, i.e., 600000 per year in Africa and approximately 90000 per year in Indian populations. It is observed that the major cases of cataract cause the blindness due to operated and delayed cases or not take seriously the problem of cataract by the peoples. In the latest survey of cataract in India that the patient of cataract increase with the age that is now common in all over the countries of the world[3].

Aspirin

As a Drug Aspirin is the very widely used drug in the world after an alcohol, basically the aspirin shows the different-2 activities like an analgesic, antipyretic and anti-inflammatory medication. It has remained clear from various years that aspirin has an antiplatelet effect by preventing the production of thromboxane, and it is also very useful to prevent heart attacks, strokes and blood clot formation in people at high risk of thrombosis. Also in the various recent studies have shown that aspirin may be very effective in preventing and treatment of many types of cancer, including colorectal cancer, breast cancer, prostate cancer, lung cancer and skin cancer[4].

Zinc

Zinc is one of the trace elements essential for human health, with a concentration in normal blood plasma level of approximately 12–20 μ/mol. Zinc is also an efficient for Lewis acid, which makes it a useful catalytic agent in hydroxylation and other enzymatic reactions. It also has a flexible coordination geometry, which allows proteins using it to rapidly change conformation in order to perform the various biological reactions. It has been estimated that nearly one third of the world's population are zinc deficient, which may lead to malabsorption, acrodermatitis enteropathica, chronic liver disease, chronic renal disease, sickle cell disease, diabetes, malignancy and other chronic illnesses[5].

Zn-Aspirin Co-ordination Complex

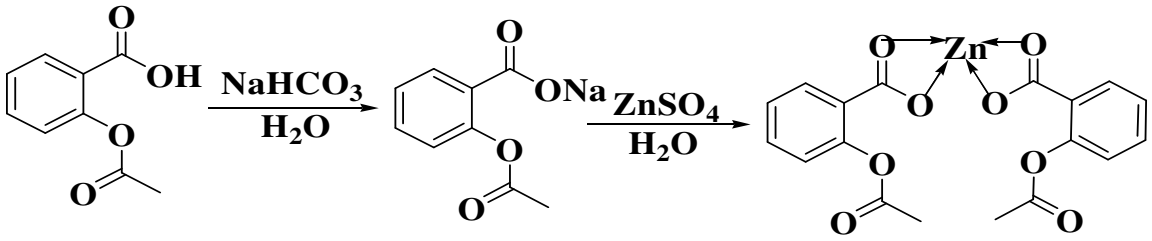
However, both aspirin and zinc have certain the various side effects. Aspirin is less toxic than salicylic acid, but its main side effects involve GI ulcers, stomach bleeding and ringing in the ears, especially at higher doses and even used in combination with other non-steroidal anti-inflammatory drugs[6]. In the same way, free zinc ions in solution are highly toxic to plants, invertebrates and even vertebrates. The modern coordination theory of medicine considers that complexation between organic medicines and minerals usually has a synergetic effect. It has been reported that zinc ion can significantly affect drug binding and facilitate the bioactivity of drugs. So Zinc- Aspirin metal complex is prepared by using the combination of zinc metal and aspirin in order to improve the various parameters like solubility of aspirin, promote the collaboration between aspirin and proteins, advance the pharmaceutical activity of aspirin and to overcome its side effects[7].The aim of this study is: (1) to synthesize of the Zn-Aspirin metal complex; (2) to find out the Zn-Aspirin metal complex antihyperinsulinemic activity on cataract by using the different rodent models. This study shows and provide the very useful parameters and result for the prevention of Diabetic cataract and Hyperinsulinemic cataract by using the Zn-Aspirin metal co-ordination complex[8].

MATERIAL AND METHODS

Normal saline and other graded chemicals. Drug solutions were prepared fresh and doses are expressed in terms of their free bases. Glibenclamide and Orlistat was used as standard drugs for comparison with various extracts. Streptozocin (Sigma-Aldrich), Lipid profile estimation kit (Transasia Bio Medical Limited, Mumbai, India) and other chemicals and solvent obtained from Qualigens, India were used.

Preparation of the Zn-Aspirin metal complex

First, the sodium bicarbonate solution in 120-140 ml of water was placed, then acetyl salicylic acid powder with the sodium bicarbonate solution was mixed continuously. The solution was filtered after proper mixing when the acetyl salicylic acid dissolved into the solution filter, and this solution was considered as (**solution A).** After that another solution of Zinc sulphate heptahydrate was prepared in 40-50 ml of water and this solution is considered as **(solution B)**. Both the solution A and B was mixed and stirred constantly. The temperature in between 10-15^0 C was maintained when the turbidity was appeared and led to form the white crystals in to the bottom of the solution. Filter the crystals from the solution was filtered and washed with minimum quantity of cold water[9]. Then, the crystals were dried under the vacuum and the complex was weighed (approx. 13.5 - 14.5gm, 63.7 %) (Scheme 1).



Scheme 1. Procedure of synthesis of zinc metal complex

Animals

Wistar rats were weighed properly and found to be approx 200-250 g. After that they were divide into six different groups and each groups consists six rats separately. Rats were kept under standard condition i.e. 12 h light/dark cycle and controlled conditions of temperature and humidity (25±2 °C, 55–65%) and with appropriate food and water supply. Rats were acclimatized to laboratory conditions for 7 days before carrying out the experiments. All the experiments were carried in a noise-free room between 08.00 to 15.00 h. The animal studies were approved by the Institutional Animal Ethics Committee (IAEC), constituted for the purpose of control and supervision of experimental animals by Ministry of Environment and Forests, Government of India, New Delhi, India.

Toxicity Study

Healthy male wistar rats, starved overnight (12 h), were divided into groups of two each and were orally fed with increasing doses (10, 30, 100 and 300mg/kg) of Zn-Aspirin complexes to determine the safe doses by up and down staircase method. The animals were observed continuously for one hour, then frequently for four hours and later at the end of 24 h[10]. After administration of the Zn-Aspirin complexes, Irwin test was conducted, where the animals were observed for behavioural changes. Further, animals were observed daily for 30 days, and mortality was recorded. Based on short- term profile the dose of the Zn-Aspirin complexes for experimental study was selected. To study the dose of the Zn-Aspirin complexes (30 mg/kg respectively), animals were fed once daily for 15 days and observed for incidences of mortality for a period of 30 days[11].

Blood sampling and glucose estimation

For blood glucose determination, blood was withdrawn by tail snipping technique. For various lipid profile and biochemical parameters estimation, blood was collected

from ophthalmic venous plexus by retro-orbital bleeding technique[12].

Experimental design

After 28 days of administration of high fat diet (HFD), animals were injected intraperitoneally with freshly prepared streptozocin (STZ) dissolved in O.1M sodium citrate buffer at pH 4.5, at a dose of 55mg/kg body weight. Following injection, animals were carefully observed for the first 24hrs for any evidence of allergic reaction, behavioural changes and convulsions. No untoward reaction was observed in any animals. Fasting blood glucose was recorded daily morning for one week. Only those animals with blood glucose more than 200mg/dl were selected for the study. Later they were divided into 5 groups, each group having 6 animals. The control rats received the same amount of 0.1 M sodium citrate buffer. The animals were allowed to drink 5% glucose solution overnight to overcome the drug- induced hypoglycemia[13]. Diabetes status was confirmed by estimating blood glucose levels after 72 hours of STZ injection. Animals showing fasting blood glucose levels above 250 mg/dl were selected for study[14].

Treatment Schedule

Group I- Normal

Group II- Diabetic control received only HFD+STZ (negative control)

Group III- Diabetic rats received Glibenclamide orally at dose of 500 mcg/kg b.w.

Group IV- Diabetic rats received Zinc (6 mg/kg/day)

Group V- Diabetic rats received Aspirin (15 mg/kg/day)

Group VI- Diabetic rats received Zn-Aspirin complexes (30 mg/kg/day)

Body weight of rats was taken on pre and post treatment i.e. 0, 7th and 15th day of post treatment by electronic balance. Fasting blood glucose level of rats were taken pre and post treatment i.e. 0, 7th and 15th day of post treatment. At the end of experimental period, all the rats were sacrificed by cervical decapitation. Blood samples were collected, allowed to clot. Serum was separated by centrifuging at 2500 rpm for 15 min and analysed for various biochemical parameters.

Statistical analysis

All the values of body weight, fasting blood sugar, and biochemical estimations were expressed as mean ± standard error of mean (S.E.M.) and analysed for ANOVA and post hoc Dunnet's t-test. Differences between groups were considered significant at $P < 0.01$ levels.

RESULT AND DISCUSSION

Table No. – 1: Mean Body Weight Change

Group	Drug	Dose	Body weight (g)	
			Onset of study	End of study
I	Normal	1 % tween 80	215.17±8.73	235.12±8.13
II	High fat diet +STZ	1 % tween 80	225.10± 15.00	200.31±8.17
III	Glibenclamide	500 mcg/kg p.o.	235.27± 8.20	197.10±10.35
IV	Zinc	6 mg/kg p.o.	235.11± 7.19	173.40±6.50**
V	Aspirin	15 mg/kg p.o.	237.15± 6.10	192.20±7.10*
VI	Zn-Aspirin complexes	30 mg/kg p.o.	235.10± 5.10	186.10±6.10*

Values are expressed as mean ± S.E.M. ($n = 6$).Values are statistically significant at $p<0.05$ vs. control group respectively (One-way ANOVA followed by Dunnett's test).

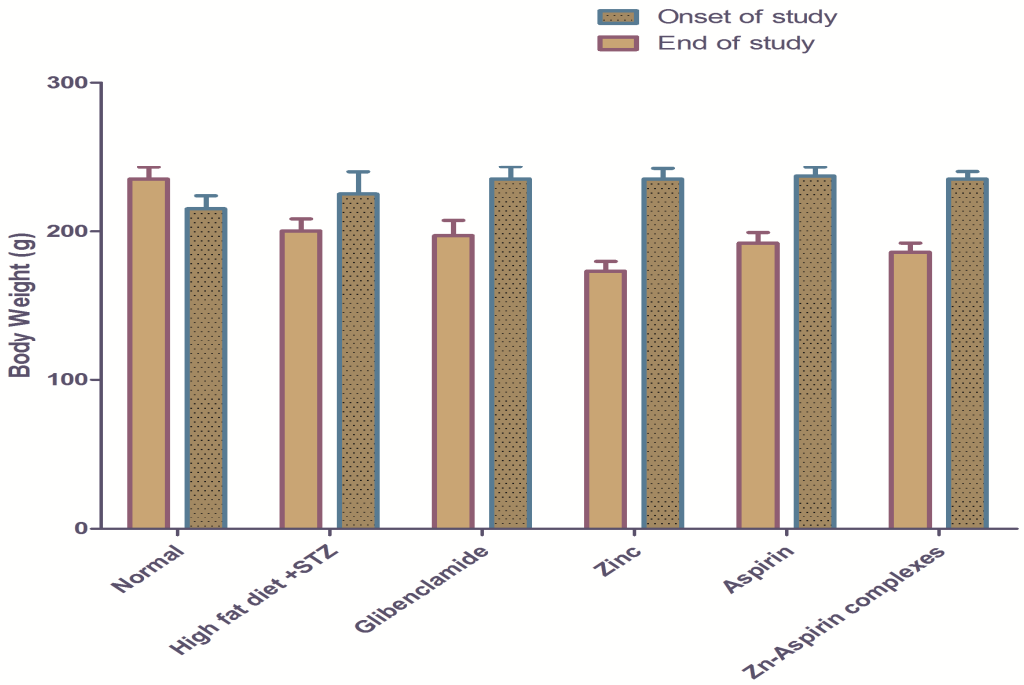


Fig. 1 Mean Body Weight Change

As represented in Table and Figure 1, body weights of animals in all groups were performed at the initial and end of the study. Body weight of animals was significantly ($p<0.05$) maintained in all treatment groups (Glibenclamide 500 mcg/kg p.o., Zinc 6 mg/kg p.o., Aspirin 15 mg/kg/p.o. and Zn-Aspirin complexes 30 mg/kg p.o. 197.10±10.35; 173.40±6.50; 192.20±7.10and 186.10±6.10) during study as compared to control group (200.31±8.17).

Table No. – 2: Antidiabetic activity of Zn-Aspirin complexes on blood glucose level in HFD-induced diabetic rats

Groups	Drug	Dose	Blood glucose (mg/dl)		
			Days 0	Days 8	Days 21
I	Normal	1 % tween 80	85.00 ± 4.10	90.00 ± 4.40	111.00 ± 5.30
II	High fat diet +STZ	1 % tween 80	296.10 ± 7.020	393.00 ± 9.61$^{\#}$	403.00± 10.00 $^{\#}$
III	Glibenclamide	500 mcg/kg p.o.	251.00± 6.50	134.00 ± 6.10**	121.00 ± 5.03**
IV	Zinc	6 mg/kg p.o.	255.00± 6.30	159.10 ± 7.30*	133.10 ± 5.70**
V	Aspirin	15 mg/kg p.o.	261.00 ± 5.70	163.00 ± 7.89 *	146.00 ± 6.40*
VI	Zn-Aspirin complexes	30 mg/kg p.o.	257.00 ± 6.60	154.21 ± 7.010*	126.00 ± 6.40*

Values are expressed as mean ± S.E.M. ($n = 6$).Values are statistically significant at $p<0.05$ vs. negative control group respectively (One-way ANOVA followed by Dunnett's test).

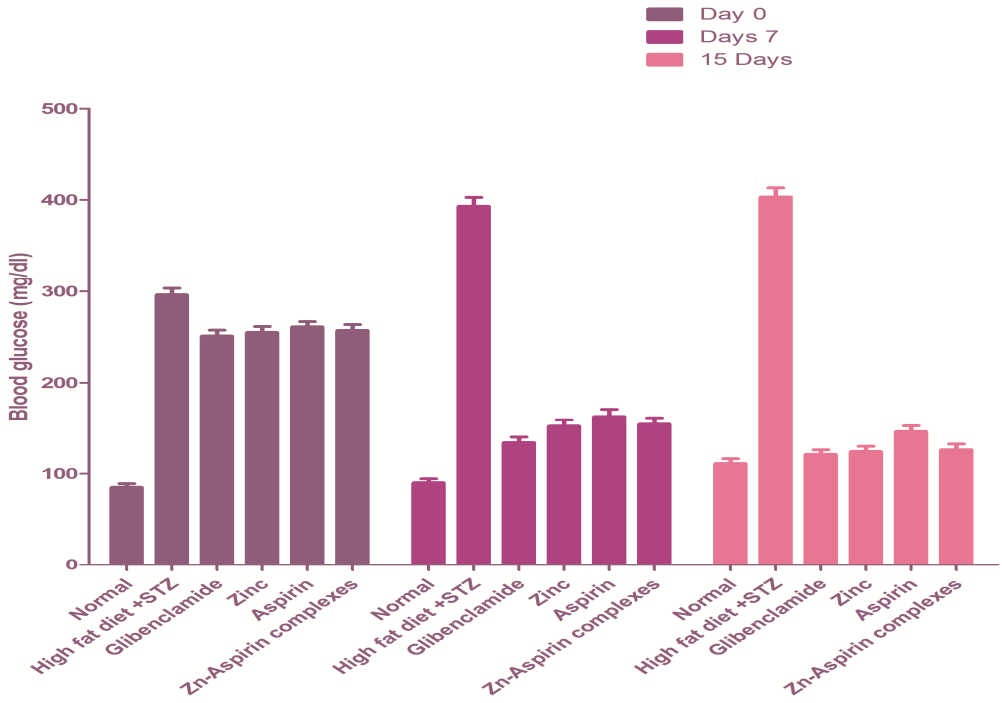


Fig2. Blood Glucose Level

As shown in Table and Figure 2, Blood glucose level of animals in all groups was recorded at 0, 8th and 21th day. Progressive decrease in blood glucose level was found in all treatment groups during study. At the end of experiment Glibenclamide 500 mcg/kgp.o., Zinc 6 mg/kg p.o., Aspirin 15 and Zn-Aspirin complexes 30 mg/kg/p.o. (121.00 ± 5.03; 133.10 ± 5.70; 146.00 ± 6.40and 126.00 ± 6.40) treated group blood glucose level was decrease significantly ($p<0.05$) at 21st days, respectively.

Table No. – 3: Effect of Zn-Aspirin complexes on total cholesterol level in HFD-induced diabetic rats

Group	Drug	Dose	Total Cholesterol (mg/dl)
I	Normal	1 % tween 80	85.60 ± 5.70
II	High fat diet +STZ	1 % tween 80	196.10 ± 5.70
III	Glibenclamide	500 mcg/kg p.o.	121.10 ± 6.00***
IV	Zinc	6 mg/kg p.o.	134.01 ± 3.40***
V	Aspirin	15 mg/kg p.o.	136.0 ± 5.10**
VI	Zn-Aspirin complexes	30 mg/kg p.o.	127.5 ± 4.60**

Values are expressed as mean ± S.E.M. (n = 6).Values are statistically significant at $p<0.05$ (One-way ANOVA followed by Dunnett's test).

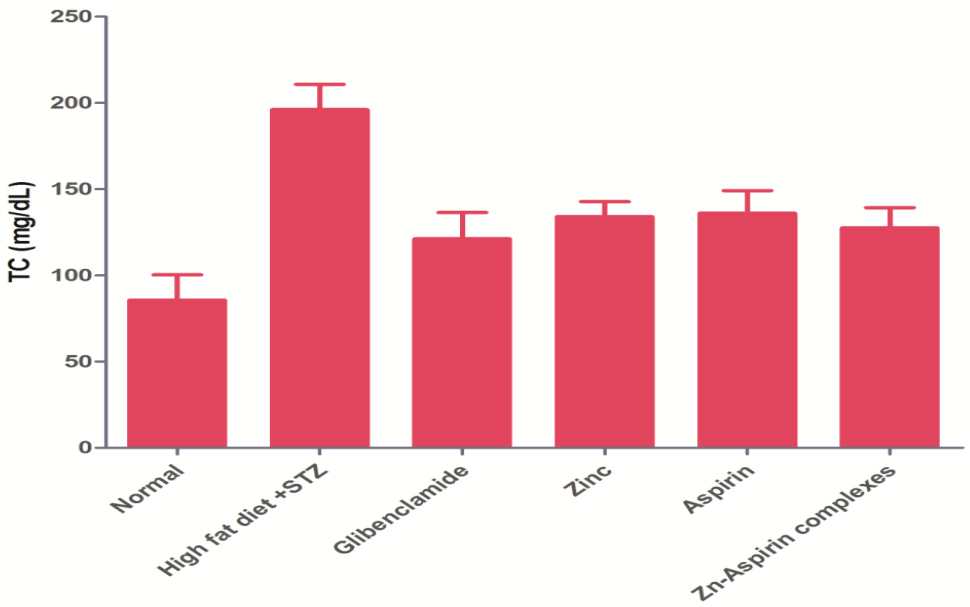


Fig – 3: Effect of Zn-Aspirin complexes on total cholesterol level in HFD-induced diabetic rats

In Aspirin 15 and Zinc 6 mg/kg/p.o. (136.0 ± 5.10 and 134.01 ± 3.40) treated group total cholesterol decreased significantly ($p < 0.05$), and Zn-Aspirin complexes 30 mg/kg/p.o. (127.5 ± 4.60) treated group total cholesterol also decreased significantly ($p < 0.05$). In 5 mg/kg Glibenclamide (121.10 ± 6.00) treated group total cholesterol decreased significantly ($p < 0.05$), respectively as compared with control group (196.10 ± 5.70), as shown in Table and Figure 3.

Table No. – 4: Effect of Zn-Aspirin complexes on triglyceride level in HFD-induced diabetic rats

Group	Drug	Dose	Triglyceride (mg/dl)
I	Normal	1 % tween 80	81.00 ± 8.10
II	High fat diet +STZ	1 % tween 80	141.5 ± 6.50
III	Glibenclamide	500 mcg/kg p.o.	87.00 ± 9.10**
IV	Zinc	6 mg/kg p.o.	98.00 ± 9.03**
V	Aspirin	15 mg/kg p.o.	100.00 ± 7.10*
VI	Zn-Aspirin complexes	30 mg/kg p.o.	91.50 ± 5.60*

Values are expressed as mean ± S.E.M. ($n = 6$).Values are statistically significant at $p<0.05$ (One-way ANOVA followed by Dunnett's test).

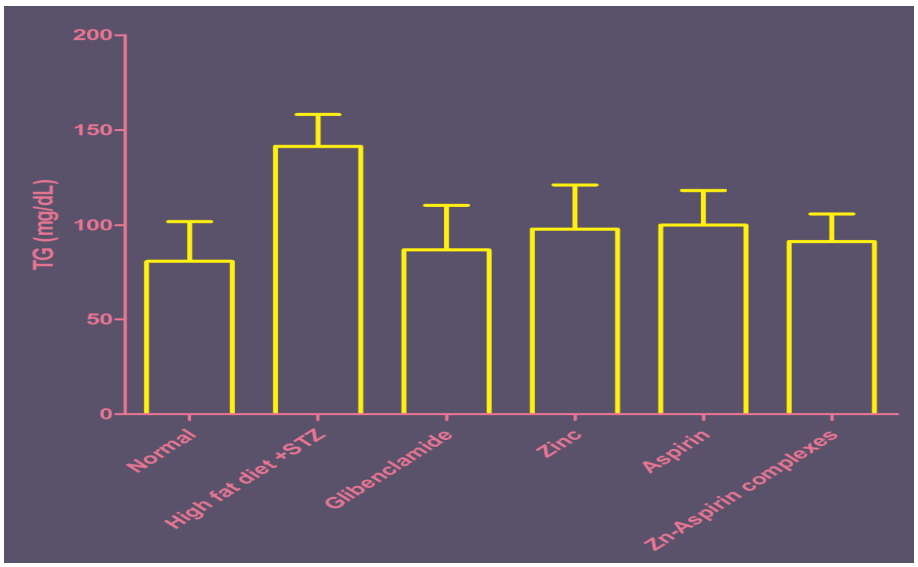


Figure 4: Effect of Zn-Aspirin complexes on triglyceride level in HFD-induced diabetic rats

In Aspirin 15 and Zinc 6 mg/kg (100.00 ± 7.10; 98.00 ± 9.03) treated group triglyceride decreased significantly ($p < 0.05$), and Zn-Aspirin complexes 30 mg/kg/p.o. (91.50 ± 5.60) treated group triglyceride also decreased significantly ($p < 0.05$). In 5 mg/kg Glibenclamide (87.00 ± 9.10) treated group triglyceride decreased significantly ($p < 0.05$), respectively as compared with control group (141.5 ± 6.50), as shown in Table and Figure 4.

Table No. – 5: Effect of Zn-Aspirin complexes on LDL in HFD-induced diabetic rats

Group	Drug	Dose	LDL (mg/dl)
I	Normal	1 % tween 80	36.66 ± 2.00
II	High fat diet +STZ	1 % tween 80	167.0 ± 2.40
III	Glibenclamide	500 mcg/kg p.o.	60.00 ± 2.10**
IV	Zinc	6 mg/kg p.o.	91.4 ± 2.61***
V	Aspirin	15 mg/kg p.o.	89.30 ± 2.50*
VI	Zn-Aspirin complexes	30 mg/kg p.o.	66.70 ± 2.00**

Values are expressed as mean ± S.E.M. ($n = 6$).Values are statistically significant at $p<0.05$ (One-way ANOVA followed by Dunnett's test).

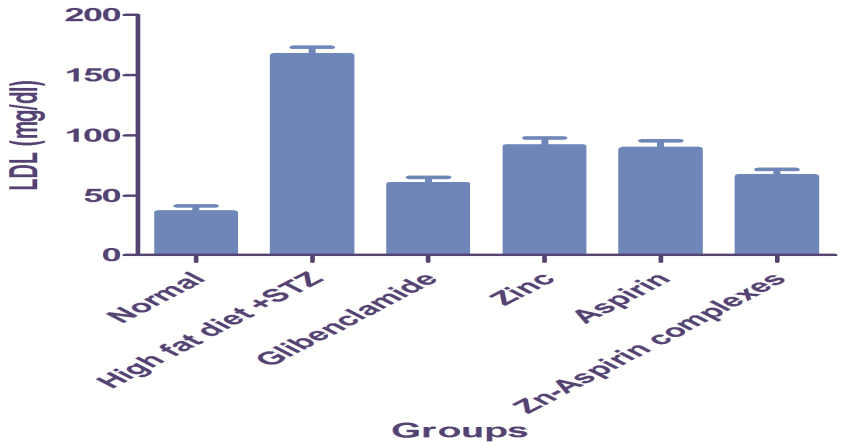


Figure 5: Effect of Zn-Aspirin complexes on LDL in HFD-induced diabetic rats

As shown in Table and Figure 5, in Aspirin 15 mg/kg and Zinc 6 mg/kg p.o. (89.30 ± 2.50; 91.4 ± 2.61) treated group low density lipoprotein (LDL) significantly decreased, and in Zn-Aspirin complexes 30 mg/kg (66.70 ± 2.00) treated group LDL also decreased significantly (p<0.01). In 5 mg/kg p.o. Glibenclamide (60.00 ± 2.10) and treated group LDL was significantly decreased (p<0.001), respectively as compared with control group (167.0 ± 2.40).

Table No. – 6: Effect of Zn-Aspirin complexes on HDL in HFD-induced diabetic rats

Group	Drug	Dose	HDL (mg/dl)
I	Normal	1 % tween 80	56.87±1.33
II	High fat diet +STZ	1 % tween 80	31.48±2.97
III	Glibenclamide	500 mcg/kg p.o.	54.78±2.13**
IV	Zinc	6 mg/kg p.o.	45.78±2.07***
V	Aspirin	15 mg/kg p.o.	40.10±1.50*
VI	Zn-Aspirin complexes	30 mg/kg p.o.	49.00±1.17**

Values are expressed as mean ± S.E.M. (n = 6).Values are statistically significant at p<0.05 (One-way ANOVA followed by Dunnett's test).

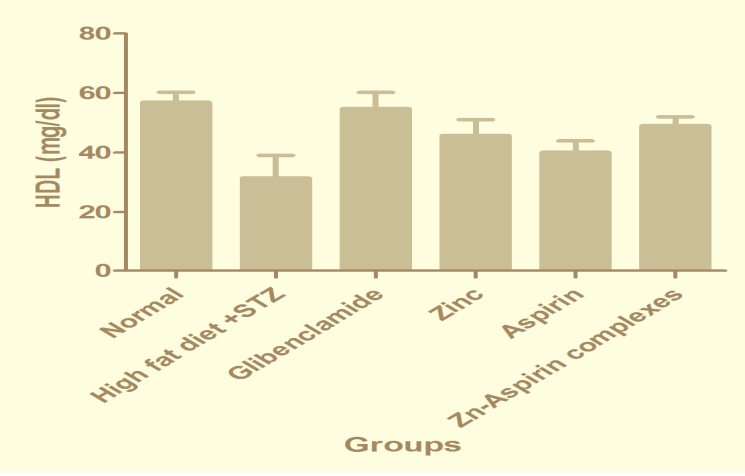


Figure 6: Effect of Zn-Aspirin complexes on HDL in HFD-induced diabetic rats

As shown in Table and Figure 6, in Aspirin 15 mg/kg and Zinc 6 mg/kg p.o. (40.10±1.50; 45.78±2.07) treated group high density lipoprotein (HDL) increased significantly (p < 0.05), and Zn-Aspirin complexes 30 mg/kg (49.00±1.17) treated group HDL also increased significantly (p < 0.001). In 5 mg/kg p.o. Glibenclamide (54.78±2.13) treated group HDL increased significantly (p<0.001), respectively as compared with control group (31.48±2.97).

Table-7: Effect of Zn-Aspirin complexes on SOD level in rats

Group	Drug	Dose	SOD (U/mg protein)
I	Normal	1 % tween 80	15.50±0.7
II	High fat diet +STZ	1 % tween 80	7.90±0.5
III	Glibenclamide	500 mcg/kg p.o.	13.9±0.52 ***
IV	Zinc	6 mg/kg p.o.	10.1±0.43 ***
V	Aspirin	15 mg/kg p.o.	12.2±0.35 ***
VI	Zn-Aspirin complexes	30 mg/kg p.o.	12.7±0.345 ***

Values are expressed as mean ± S.E.M. (n = 6).Values are statistically significant at p<0.05 (One-way ANOVA followed by Dunnett's test).

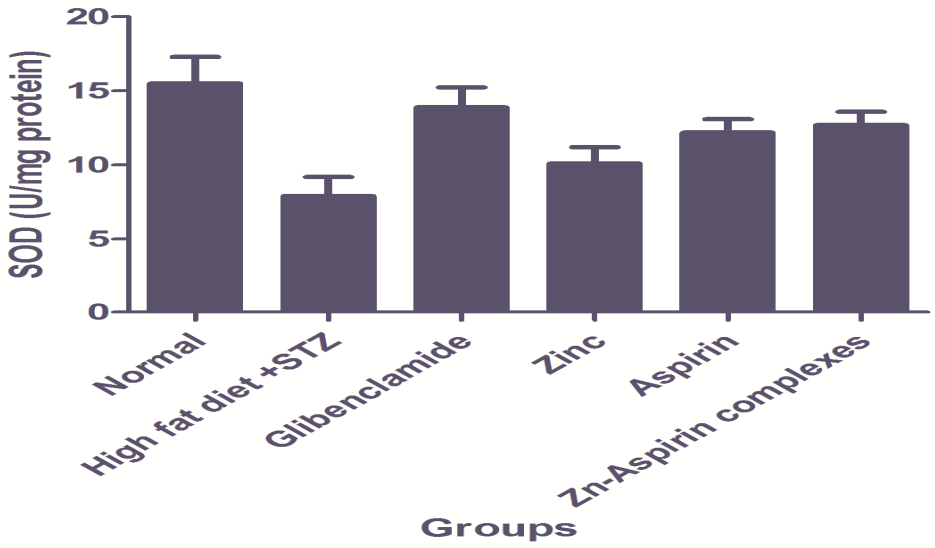


Figure 7: Effect of Zn-Aspirin complexes on SOD level in rats

From antioxidant study, it was found that in HFD induced diabetic control group, Super Oxide dismutase (SOD) level was decreased significantly (p < 0.001), while in treated group of 6 mg/kg p.o. Zinc, 15 mg/kg p.o. Aspirin, and 30 mg/kg p.o. Zn-Aspirin complexes group. SOD level increased significantly (p < 0.001), as represented in Table and Figure 7.

Table-8: Effect of Zn-Aspirin complexes on lipid peroxidation level in rats

Group	Drug	Dose	lipid peroxidation (nM of MDA / min×mg protein)
I	Normal	1 % tween 80	15.67±0.79
II	High fat diet +STZ	1 % tween 80	41.50±4.81
III	Glibenclamide	500 mcg/kg p.o.	21.28±1.81***
IV	Zinc	6 mg/kg p.o.	32.12±4.53*
V	Aspirin	15 mg/kg p.o.	25.80±4.71***
VI	Zn-Aspirin complexes	30 mg/kg p.o.	23.31±4.3 0***

Values are expressed as mean ± S.E.M. (n = 6).Values are statistically significant at p<0.05 (One-way ANOVA followed by Dunnett's test).

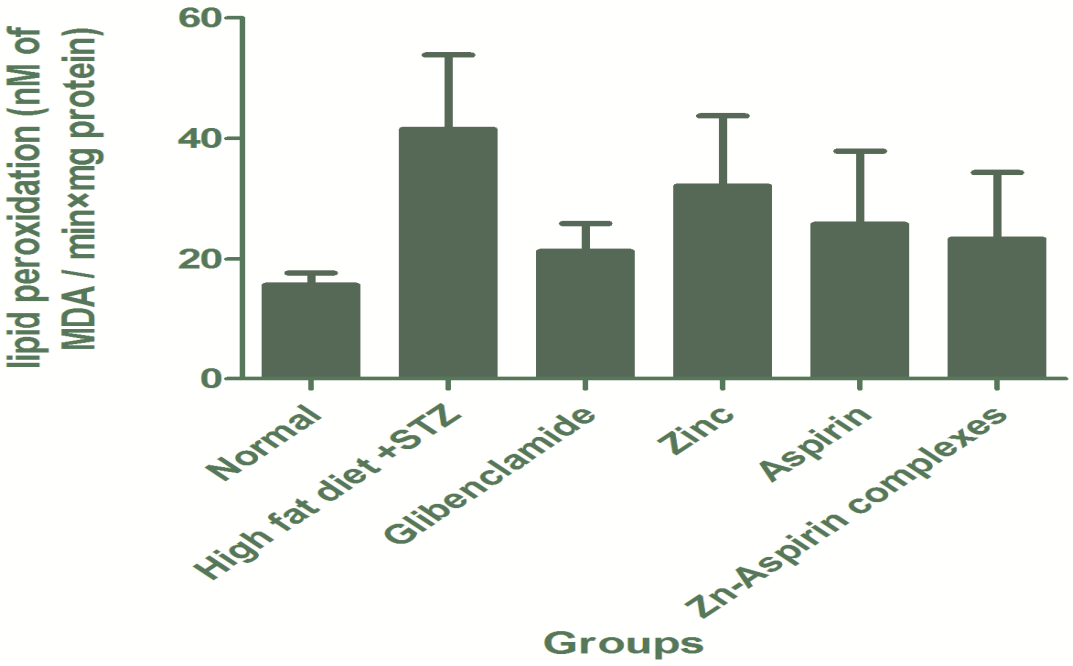


Figure 8: Effect of Zn-Aspirin complexes on lipid peroxidation level in rats

In HFD induced diabetic control group lipid peroxidation was found to be increased significantly (p < 0.001),while in 6 mg/kg p.o. Zinc, 15 mg/kg p.o. Aspirin, and 30 mg/kg p.o. Zn-Aspirin complexes group treated group there was significant decreased (p < 0.001) found in lipid peroxidation(Table and Figure 8).

Table-9: Effect of Zn-Aspirin complexes on CAT level in rats

Group	Drug	Dose	CAT (n mole H2O2/min/mg protein)
I	Normal	1 % tween 80	14.79±14.5
II	High fat diet +STZ	1 % tween 80	8.42±4.
III	Glibenclamide	500 mcg/kg p.o.	15.68±2.5***
IV	Zinc	6 mg/kg p.o.	10.51±3.1*
V	Aspirin	15 mg/kg p.o.	13.56±2.4***
VI	Zn-Aspirin complexes	30 mg/kg p.o.	14.42±2.5***

Values are expressed as mean ± S.E.M. (n = 6).Values are statistically significant at p<0.05 (One-way ANOVA followed by Dunnett's test).

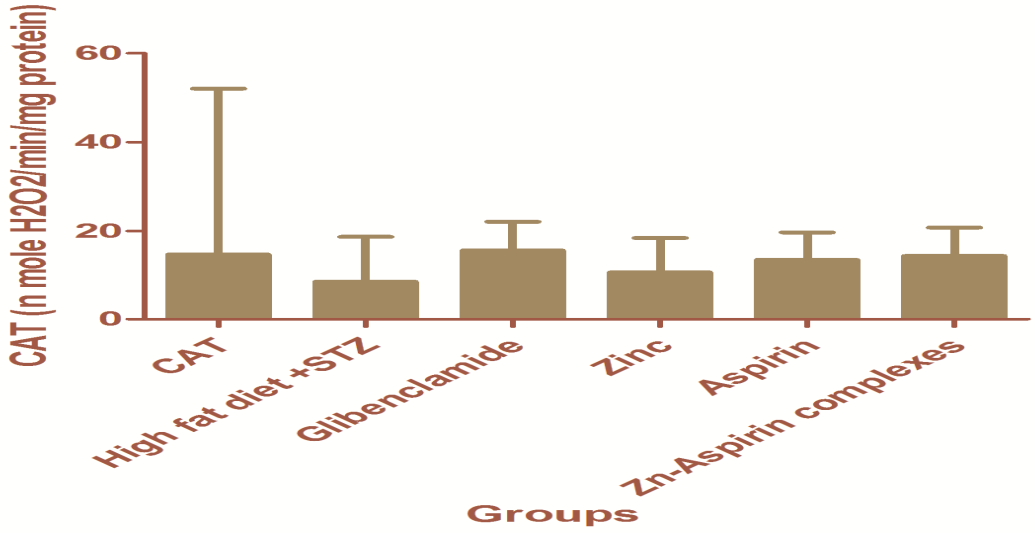


Figure 9: Effect of Zn-Aspirin complexes on CAT level in rats

In HFD induced diabetic control group CAT was found to be decreased significantly (p < 0.001),while 6 mg/kg p.o. Zinc, 15 mg/kg p.o. Aspirin, and 30 mg/kg p.o. Zn-Aspirin complexes treated group there was significant increase in CAT(Table and Figure 9). In HFD induced diabetic control group GSH was found to be decreased significantly (p < 0.001),while 6 mg/kg p.o. Zinc, 15 mg/kg p.o. Aspirin, and 30 mg/kg p.o. Zn-Aspirin complexes group there was significant increased found in GSH (Table and Figure 10).

Table-10: Effect of Zn-Aspirin complexes on GSH level in rats

Group	Drug	Dose	GSH (n mole/mg protein)
I	Normal	1 % tween 80	47.04±2.3
II	High fat diet +STZ	1 % tween 80	22.61±3.3
III	Glibenclamide	500 mcg/kg p.o.	45.14±1.3***
IV	Zinc	6 mg/kg p.o.	25.87±3.1*
V	Aspirin	15 mg/kg p.o.	34.56±2.3***
VI	Zn-Aspirin complexes	30 mg/kg p.o.	40.93±1.1***

Values are expressed as mean ± S.E.M. (n = 6).Values are statistically significant at $p<0.05$ (One-way ANOVA followed by Dunnett's test).

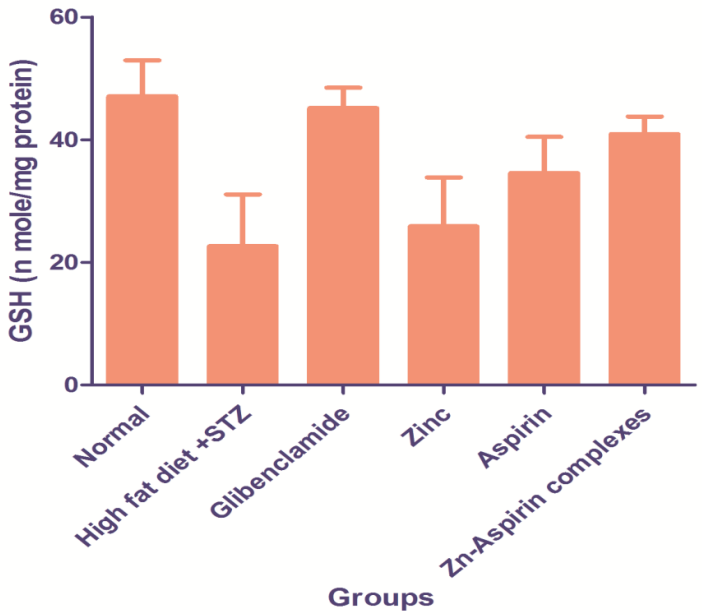


Figure 10: Effect of Zn-Aspirin complexes on GSH level in rats

In Aspirin 15 and Zinc 6 mg/kg/p.o. (15.31 ± 3.16 and 14.73 ± 3.40) treated group Haemoglobin increased significantly ($p < 0.05$), and Zn-Aspirin complexes 30 mg/kg/p.o. (17.72 ± 4.34) treated group Haemoglobin also increased significantly ($p < 0.05$). In 5 mg/kg Glibenclamide (18.32 ± 4.70) treated group Haemoglobin significantly ($p < 0.05$), respectively as compared with control group (9.91 ± 0.65) (table and Figure 11).

Table No. 11: Effect of Zn-Aspirin complexes on Haemoglobin level in HFD-induced diabetic **rats**

Group	Drug	Dose	Haemoglobin (gm/dL)
I	Normal	1 % tween 80	14.11 ± 2.53
II	High fat diet +STZ	1 % tween 80	9.91 ± 0.65
III	Glibenclamide	500 mcg/kg p.o.	18.32 ± 4.70***
IV	Zinc	6 mg/kg p.o.	14.73 ± 3.40***
V	Aspirin	15 mg/kg p.o.	15.31 ± 3.16**
VI	Zn-Aspirin complexes	30 mg/kg p.o.	17.72 ± 4.34***

Values are expressed as mean ± S.E.M. (n = 6).Values are statistically significant at p<0.05 (One-way ANOVA followed by Dunnett's test).

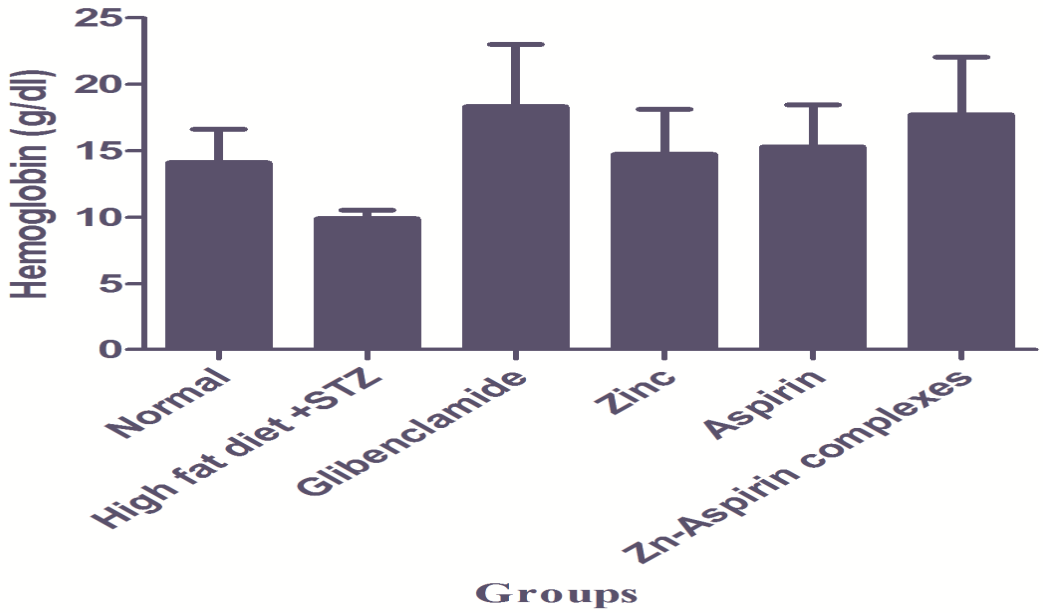


Figure 11: Effect of Zn-Aspirin complexes on Haemoglobin level in HFD-induced diabetic rats

Conclusions

Zn-Aspirin complexes has been prepared and by using suitable animal model it was observed that Zn-Aspirin complexes exhibits significant anti-diabetic activities in Streptozotocin induced diabetic rats. Also it shows potent activity on cataract.

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