



**THE EFFECT OF HYPOGLYCEMI OF SELENIUM NANO PARTICLES ON LIPID
PROFILES AND THYROID FACTORS IN DIABETIC MALE RATS BY
STREPTOYSIN IN COMPARED TO GLIBENCLAMIDE DRUG**

**MOHAMAD FAZILATI¹, NASER NABI ABDOLYOUSEFI*(CORRESPONDS
AUTHOR), MAHNAZ REZAEI KELISHADI, ALI GHASEMI, SETAREH ZAMANI,
REZA SOLEYMANI, AZAR RAHIMI**

1 Department of Biology, Faculty of Management, Payam Noor University of Isfahan, Tehran,
Iran

ABSTRACT

Objective: To investigate the effect of selenium nanoparticles compared to glibenclamide drug in diabetic patients

Methods: selenium nanoparticle drug doses (0/0,2/1,4/0, mg/kg) and glibenclamide drug. Drug doses (10mg/kg) for 14 days to diabetic rats by Astreptozsyn material were injected and blood sampling was carried from rats and blood glucose, lipid profiles and thyroidic hormone were analyzed.

Results: cholesterol, triglycerides, lipoprotein with low density, Thyrotroponin (T3) and glucose in diabetic rats showed increased density and lipo protein with high density showed decreased density. Using selenium nano particles promoted all the biochemical factors in diabetic rats.

Result: selenium nano particles compared with glibenclamide drug showed better effects.

BACKGROUND:

Diabetes mellitus is one of the defects of intravenous glands that every year due to the aging population, obesity and urbanization is increasing. Due to increased diseases and sometimes fatal diseases leaves them it

necessitates the need to examine ways to treat it. Stress and oxidation plays an important role in patients diabetes.

Diabetes usually occurs with increased production of free radicals or antioxidant

production defect (1), diabetic patient's glucose is prepared to oxidation and produces prooxidant and free toxic hydrogen (2) Liver is the main body in detoxification free radicals oxidative stress in elementary forms of diabetes. The strategy of reducing oxidative stress in diabetes disease is very essential.

(3) Selenium nanoparticle in the body becomes selenium and selenium as a center of making up and arranging proteins such as glutathione peroxidase, phospholipid glutathione hydroxyl peroxidase and reductase acts.

Selenium nanoparticle increases the power of antioxidant through stimulation of superoxide dismutase, glutathione reductase and removing free radicals. (4, 5, 6, 7) Selenium is a powerful effect of antioxidant properties seem an essential ingredient for the treatment of diabetes.

(8) However, there are many problems in the use of drug and selenium treatment that can be noted that the powder selenium element in the ground state is insoluble in water, thus inert biologically well (9) Also the mechanism of induction of glutathione S-transferase is the hard mechanism (10) The application of finite element selenium in drug treatment has limited. Nano technology used to preserve the features of these elements to

food and drug application offers using of this element. (10) Also selenium nanoparticles compared with the element selenium show less toxicity (10) therefore, the present study was to evaluate the effect of selenium nanoparticles compared with drug glibenclamide in diabetic rats.

MATERIALS AND METHODS:

Buffers phosphate (PBS) from the companies Merck (Tehran), nanoparticles of selenium (Se) from the nanotechnology companies (Germany), Astropozsyn (STZ), the kit for measuring cholesterol, triglycerides, lipoprotein, high density (HDL), low-density lipoprotein (LDL), thyroid hormones (T3, T4, TSH) test participation Pars (Tehran) was used.

Laboratory animals:

This study, an experimental study is based on compliance with all ethical codes by animals in laboratory developed by the Ministry of Health, Medical Education Research was carried out. Before studying animals, they were all in a certain weight range. Weight mean rats used in this study was (180-200kg). The total number of rats in this study were 42 male rats Vistar race. The rats quickly by dose mg60 Astropozsyn in mol / L 1/0 Bafsytrat at PH = 4.5 intravenously were diabetic by intravenous injection. After a week intravenous injection, the blood

glucose of rats increased above 300mg / dL. Then it begun the period treatment of 14 days and then randomly divided into 6 groups by necessary of these factors, respectively.

group 1 (normal group control): During the test, no solvents or received medical treatment under normal diet. group 2 (diabetic control group) dose group (60 mg / kg) material Asterpetozsyn (STZ) and time-consuming saline (NS) they received.

Group 3 (glibenclamide): The Group also by receiving dose ((60 mg / kgSTZ, dose (10 mg / kg) treatment with mud Bnklamydrabh received normal saline.

Group 4: the diabetic group (0/1 mg / kg) nanoparticles of selenium (Se) and time-consuming saline

Group 5: the diabetic group (0/2 mg / kg) nanoparticles of selenium (Se) and time-consuming saline.

Group 6: the diabetic group (0/4 mg / kg) nanoparticles of selenium (Se) and time-consuming saline

After the end of the period of 14 days to set up a mild anesthetic By etter to evaluate serum concentrations of biochemical factors to blooding serum of heart and after centrifuging blood the scale of 3000 rpm and separating serum direction and to measure biochemical parameters was made and conveyed to laboratory. To measure

Biochemical parameters HDL, LDL, TG and cholesterol used IFCC standard method and by auto analyzer apparatus the RA-1000 model was used. The scale of cholesterol and sermic triglicerid using inquiry management company mean darmankave(Iran) through a set lipoproteins calorie meter method based on a combination of sedimentary and using kits of darmankave company management were explored. HDL- cholesterol and HDL were measured by sedimentation technique.9) to measure thyroid hormones using RIA (RIA) was used apparatus specifications (1027 Prague 10 Czech, ImmunoTech ImmunoTech Radio (Pars test) was performed. (12,11) blood glucose density by the EaseGluco (142Combo) device was measured and all statistical analysis using SPSS version 11.5 with regard to $p \leq 0 / 05$, was adopted.

RESULTS

Body weight of rats and blood glucose Weight diabetic rats in compared with the control group showed a significant decrease ($P \leq 0 / 05$). blood glucose in diabetic rats compared with the control group, Barrett demonstrated a significant increase ($P \leq 0 / 001$). After using of selenium nanoparticle came into existence a significant increase in body weight compared to diabetic control rats, and glibenclamide ($P \leq 0 / 01$), as well as

selenium nanoparticles significantly the glibenclamide and diabetic control rats decreased in blood glucose compared with drug ($P \leq 0 / 05$)

Table1: the effect of selenium nanoparticles compared to patients diabetes drug glibenclamide and Body weight of rats and blood glucose

Group rats	initial weight (g)	Final weight (g),	glucose (mg / dL)
Control	188.25 ± 3.60	209.5 ± 3.22	90
Diabetic control	185.70 ± 3.95	172.6 ± 1.76 α	380 α
Glibenclamide	195.25 ± 5.14	185.6 ± 4.70	188
Nano Se 0.1	190.00 ± 2.70	204. ± 2.04 β	122 β
Nano Se0.2	187.5 ± 6.80	195.75 ± 5.85 β	155 β
Nano Se0.4	193.20 ± 3.00	213.8 ± 8.77 β	100 β

Mark α compared with the control group, symbol β compared to a glibenclamide and diabetic control rat's drug.

Cholesterol, triglycerides, lipoproteins Plasma total cholesterol, low density more lipoproteins (LDL) in diabetic control group ($P \leq$) compared with normal control group increased significantly. lipoproteins with high density in diabetic control group (HDL) decreased, but not significantly triglycerides in receiving rats 0/1 doses nanoparticles of selenium compared to the glibenclamide receivers and male rats with streptosin and rats with normal saline groups and recipient of the nanoparticles was a significant

decrease ($P \leq 0 / 05$). Cholesterol recipient of the dose 0/1 mg / kg and 0/2 mg / kg nanoparticle selenium compared with rats receiving the streptosin with saline to reduce significantly and compared with glibenclamide changes were not significant. ($P \leq 0 / 05$)). Lipoproteins with high density (HDL) in rats receiving doses of 0/2 mg / kg nano-particles of selenium compared to rats receiving glibenclamide and rats receiving the streptosin with normal saline groups were significant increase. Lipoproteins low density (LDL) rats received different doses of the drug nanoparticles of recipient didnot not create significant

(Table 2): the effect of selenium compared with glibenclamide on cholesterol, triglycerides, total lipoproteins

Group rats	Cholesterol (mg / dL)	triglyceride (mg / dL)	HDL (mg / dL)	LDL (mg / dL)
Control	58.50 ± 8.42	38.50 ± 4.59	47.50 ± 4.87	21.25 ± 2.65
Diabetic control	76.00 ± 3.93 α	52.50 ± 7.86 α	42.25 ± 3.35 α	43.25 ± 6.53 α
Glibenclamide	56.00 ± 5.84 β	44.50 ± 5.95	37.79 ± 2.92	39.75 ± 3.47
Nano Se0.1	52.00 ± 2.58 β	24.20 ± 2.59 π	35.80 ± 2.87	45.20 ± 6.68
Nano Se0.2	65.50 ± 2.46 β	43.75 ± 2.13	48.00 ± 1.47 \neq	47.00 ± 2.97
Nano Se0.4	58.00 ± 6.14 β	45.75 ± 4.97	40.00 ± 4.02	41.50 ± 4.55

Mark α compared with the control group, Mark β compared to the control group, symbol π compared to the group receiving a dose of 1/0 compared to group the

glibenclamide and other nanoparticles, sign \neq comparison group receiving adose of 2/0 compared to group, HDL: lipideither high, LDL: low density lipoproteins.

Thyroid hormones

Thyroido tyronyn (T3) in diabetic control group than the normal control group increased significantly.and (T3)in recipient groups of nanoparticles selenium compared to diabetic control group and glibenclamide

showed significant ($P \leq 0 / 05$), but hormones by Thyroido tyronyn (T4) thyroid-stimulating hormones (TSH)in the group receiving the nanoparticle by1/dose and glibenclamide showed significant ($P \leq 0 / 05$) (table 3)

Group rats	T3	T4	TSH
Control	30.25 ± 3.6	2.75 ± .49	.15 ± .002
Diabeticcontrol	43.75 ± 3.75 α	2.15 ± .64	.10 ± .000
Glibenclamide	16.00 ± 3.08 β	1.00 ± .02	.17 ± .00
NanoSe1 / 0	23.20 ± 2.1 β	1.50 ± .26	.16 ± .002
NanoSe2 / 0	14.50 ± 3.17 β	1.25 ± .43	.15 ± .002
NanoSe4 / 0	24.33 ± 9.02 β	2.07 ± .44	.15 ± .002

Mark α compared to the control group, Mark β compared with the comparison group.

DISCUSSION

The results of this study suggest that nano particles of selenium effectively promotes healing in diabetic rats .on the other hand, selenium is one of essential elements to human health. Selenium has a liver protection, antioxidation, and has inhibitory chemical properties (13,14), selenium also as a powerful antioxidant in deficiency of diabetes (15) and participates setting of thyroid hormones by the hydrogen peroxide oxidation in Lipidoxidation .

(16) In fact, there is direct connection between oxidative stress and diabetes and The liver is the main body engaging in this project due to resourceful Mitokendry materials in making metabolic roles. The liver plays an important roles in glucose metabolism, and oxidative stress. there exists oxidative stress accompanied by destroying

liver cells. In the present study, there was increasing significantly in Cholesterol, triglycerides, lipoproteins and blood glucose. also, decreasing significantly in(T3) hormones. One main problems in diabetes is the effect of Vasclourosisio (heart and varid disease)which in the result of unnormal lipid metabolism and increasing diabetes that cause lipid proxidation and production of free radicals.lipid profiles in diabet identified by lowering HDL,evaluating LDL and triglycerides.(16) Nano particles of selenium by having the best natural anti oxidants by increasing antioxidant activity (glutathione peroxidase, glutathione Redoktaze and super Motaz oxide form (SOD) prevents peroxidation and also free radicals in human body. In this study Nano particles of selenium by preventing peroxidation and free radicals cause to decrease significantly in

blood glucose, Cholesterol, triglycerides, lipoproteins and also increasing significantly in HDL than glibenclamide (table 2)

CONCLUSIONS

Nano particles of selenium with powerful antioxidant and raising activity of antioxidant effect better disease in comparison with the drug glibenclamide in reducing blood glucose, triglycerides, cholesterol, T3, and increasing HDL. Also, nano particles of selenium decreased T3 hormone seems effective in thyroidic disorders.

APPRECIATION

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