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STUDY OF HYPOLIPIDEMIC EFFECT OF HERBAL AND HOMEOPATHIC ANTIDIABETIC DRUGS IN ALLOXAN INDUCED DIABETIC RABBITS

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ABSTRACT: Diabetes mellitus is often associated with hyperlipidemia, which may lead to coronary heart disease. Commercially available herbal and homeopathic drugs claimed to be useful for the treatment of diabetes mellitus are evaluated for hypolipidemic effect in alloxan induced diabetic rabbits. The glibenclamide and gliclazide were used as standard drugs. The herbal drug Dolabi significantly ($p<0.05$) reduces blood total lipids level while Dawai Ajeeb Ziabetus failed to alter blood total lipids level of alloxan induced diabetic rabbits. All homeopathic drugs viz. acid phos, syz jambol and uranium nitricum did not reduce blood total lipids level.

KEY WORDS: Diabetes mellitus, herbal, homeopathic, alloxan induced diabetic rabbits, blood total lipids level.

INTRODUCTION

Diabetes mellitus is a general metabolic disease that disturbs not only carbohydrate metabolism but protein and lipid metabolism as well. Diabetes mellitus is often associated with hyperlipidemia (Jim & Bail, 1985). This abnormal lipid metabolism may lead to various acute and chronic complications like atherosclerosis, myocardial infarction (Davidson, 1981) and are major causes of premature death in patients with diabetes mellitus (West, 1978). The abnormal high concentration of serum lipids in diabetic subjects is due mainly to the increase in mobilization of free fatty acids from the peripheral fat deposits (Goodman & Gilman, 1985).

World Health Organization (1980) has recommended that use of traditional plant treatment for diabetes mellitus should be encouraged especially in third world countries where access of conventional treatment of diabetes mellitus is not adequate. It is estimated that around 80% of the world's population in developing countries relies on herbal remedies (Khan, 1985). Plant drugs are frequently considered to be less toxic and free from side effects due to low amount of active constituent(s) and the presence of several other components that may respond to the side effects of the potent part of the drug (Momin, 1987). More than 400 traditional plants have been shown to have hypoglycemic action in animals and humans (Twaij & Al Badr, 1988; Gupta, 1994) and are used for treating diabetes mellitus (Ajgaonkar, 1979; Bailley & Day, 1989; Ivorara *et at.*, 1989; Mangola, 1988; Rahman & Zaman, 1989; Karunanayake *et al.*, 1984; Almalaj & Ignacimuthu, 1998; Prince *et al.*, 1998; Akhtar *et al.*, 1983). It has been reported that most of plants used for treating diabetes belong to chemical groups glycosides, alkaloids, sulfur oils and flavonoids (Oliver~Bever, 1986; Cherian *et at.*, 1992; Sarg *et al.*, 1991).

Homeopathy seeks to cure in accordance with natural laws of healing and uses medicines made from natural substances viz. animal, vegetable and mineral (Hanemann; Bhanja, 1967).

As it is evident that diabetes mellitus is often associated with hyperlipidemia, thus present study is done to evaluate the hypoloipidemic potential of commercially available anti-diabetic herbal and homeopathic drugs using allopathic drug as a controlled standard.

MATERIALS AND METHODS

Chemicals and drugs were obtained from the following resources:

Gum Tragacanth (local market), Glibenclamide (Efroze Chemical Industries (Pvt.) Ltd., Karachi), Acarbose (Bayer Pharma Pvt Ltd., Germany), Metformin (Tabros Pharma Pvt Ltd., Karachi). The herbal drugs i.e. Dolabi (Hamdard Laboratories, Karachi) and Dawai Ajeeb Ziabitus (Ajmal Dawakhana, Lahore). Homeopathic drugs viz. SyzJambol (BM Homeopathic Pharmacy, Lahore), Acid Phos and Uranium Nitricum were purchased from a local homeopathic pharmacy. D.I.Khan. Alloxan monohydrate (Merck, Germany), Blood total lipids determination Kit (Randox Laboratories Ltd. U.K.).

Composition of the dugs used:

Dolabi: Extract 9f pancreas, *Gynnema sylvestre, Acacia Arabica,* Calcined iron, Calcined egg shell, *Bambusa arundinacea,* Opium, *Rumix vesicarius,* Pearls, Gum acacia (excipient).

Table -1: Dose calculation of various drugs for rabbits.

Name of drug	Minimum recommended dose for 70kg body weight/Equivalent dose	Dose per kg body weight
Gliclazide	80mgl	1. 14mg
Glibenclamide	5mg'	0.07mg
Dolabi	616mg2 (2 tablets)	8.80mg
Dawai Ajeeb Ziabetus	1111.60mg2 (2 tablets)	15.88mg
Acid Phos	20 drops3	4 drops (Minimum required dose)
Syz-Jambol	21Omg3	3mg
Uranium Nitricum	20 drops3	4 drops (Minimum required dose)

1 Martindale. The complete drug reference, 32nd Ed, 1999. 2 Manufacturers specification.
3 Clark, 1975.

Dawai Ajeeb Ziabetus: Tukhm Kharfa Siyah, Tukhm Jaman, Tukhm Kahu, Sandal Sapaid, Gul Surkh, Qusshta Poast Sapaid, Kashniz Khushk, Gul-eArmani, Gul-e-Anar, Qushta Sadaf, Qushta Zamurrad, Qushta Faulad, Sunaq Dana.

Acid Phos: Phosphoric acid.
Uranium Nitricum: Nitrate of Uranium (made from Pitch-blend; an oxide of Uranium)

Syz-Jambol: Insulin DS, Uranium Nitricum D2.
Experimental animals used: Healthy male rabbits weighing 1000-1500 g were used in these experiments. The animals were kept under observation for one week before experimentation in the animal house. The animals were fed the green fodder *ad libitum.* Fresh and whole some water was also supplied *ad libitum.*

Preparation of alloxan diabetic rabbits: Rabbits were made diabetic by injecting alloxan monohydrate
150mg/kg body weight in marginal ear vein using turberculin syringe. After eight days of injection the blood glucose levels of the surviving rabbits were determined. Rabbits with blood glucose level of 300500 mgllOO ml were considered as diabetic and were employed for further study (Butt, 1962, Akhtar *et al.,* 1981).

Calculation of dose: The doses of the drugs were calculated on body weight as shown in Table-I.

Administration of drug: Dose of the drug was carefully calculated for each animal according to the data shown in Table-I, then accurately weighed and suspended in gum tragacanth solution (2%). The suspension was then administrated by passing a polythene feeding tube # 6, equipped with a 20 ml syringe containing the prepared dose, through nasal
. route into the stomach of the rabbit.

Determination of blood total lipids level: Total lipids were measured on the first day before administration of drug and on eighth day after 7 days of consecutive administration of drugs to evaluate hypolipidemic effect of these drugs. Total Lipids was determined using chemical kit method (Zollner & Kirsch, 1962) according to the instructions of manufacturer (Rando x Laboratories Ltd. U.K.).

Statistical analysis: Statistical analysis was carried out using "Minitab" a statistical package. The significant difference was measured using student-t test (at 95% confidence inte~val) and one-way ANOV A.

Table 2: Mean (:tSEM) Blood total lipids level of Alloxan induced diabetic rabbits after oral administration of various drugs for 7 days (Allopathic, herbal and homeopathic).

Name of drug	Before administration of drug	After 7 days of administration of drug
Gum Tragacanth	624:t 5.37	627:t7.46
Glibenclamide	640:t 7.83	659:t 8.69
Acarbose	667 :t 9.63	606 :t 11. 99
Metformin	664 :t 7.64	639:t 11.73
Dolabi	651:t 10.57	621 :t 20.18
Dawai Ajeeb Ziabitus	671 :t 6.30	660 :t 7.52
Syz-Jambol	680:t 8.48	673:t 8.19
Acid Phos	615 :t 8.62	604:t 8.35
Uranium Nitricum	638 :t 6.95	643 :t 5.82

RESULTS AND DISCUSSION

Effect of 2% *gum tragacanth aqueous suspension on blood total lipids level:* The oral administration of gum tragacanth aqueous suspension (2%, 20ml) for 7 days did not show any significant change *(p* > 0.05) in blood total lipids level before and after administration of drug for 7 days. Results are shown in Table 2.

Rabbits treated with glibenclamide, acarbose and metformin: Blood total lipids level of rabbits before and after treatment with glibenclamide (O.lmg/kg body weight) was 640:t7.83 mg/lOOml and 649:t8.69 mg/100ml, respectively. The difference between two levels was statistically non-significant (P>0.05).

The treatment of the rabbits with acarbose (0.71 mg/kg body weight) also showed the slight (3.15% decrease) but insignificant *(p* > 0.05) decrease in the blood total lipids levels. Results are shown in Table -2.

The oral administration of Metformin (7.14 mg/Kg body weight) showed the 3.77 % decrease in the blood total lipids levels. The decrease was statistically nonsignificant (P>0.05).

Table 2 shows that 2% gum tragacanth suspension and allopathic drugs viz., glibenclamide, acarbose and metformin didn't alter blood total lipids level in diabetic rabbits significantly.

However metformin produced maximum decrease (table 2) in blood total lipids level, which is 3.77%. There are some findings that metformin lowers blood concentrations of very low density lipoproteins and cholesterol on long term treatment of type 2 diabetes mellitus with concomitant lipid disorders (Schafer, 1983; Rains *et al,* 1989; Lalor *et a!.,* 1990).

Acarbose produced second maximum decrease (table 2) in blood total lipids level, which is 3.15%. There are some reports that in type 2 diabetics, acarbose reduced serum VLDL and triglycerides by 30% (Nestel *et a!.,* 1985; Homma *et al.,* 1982; Baron *et al.,* 1987).

Effect of herbal drugs on blood total lipids level in diabetic rabbits: The oral administration of Dolabi (8.8 mg/kg body weight) showed 4.60 % decrease in the total blood lipid level, results are shown in Table 2. The reduction in the blood lipid level was significant (P<0.05).

The oral administration of Dawai Ajeeb Ziabetus (15.88 mg/kg body weight) showed only 1.64 % decrease in the total blood lipid level, results are shown in Table 2. The reduction in the blood lipid level was insignificant (P>0.05).

Results show that oral administration of Dolabi significantly reduces the blood total lipids level, while other herbal drug did not alter the blood total lipids level. This significant reduction of total lipids level by

Dolabi may be due to the presence of various constituents in the preparation.

Effect of homeopathic drugs on blood total lipids level in diabetic rabbits: The oral administration of Acid Phos for 7 days in the alloxan induced diabetics rabbits showed only 1.79% decrease in total blood lipid concentrations that was statistically non-significant (P>O.05). Results are shown in Table 2.

The treatment of the rabbits with Syz-Jambol 3mg/kg body weight and Uranium Nitricum 4 drops/kg body weight for 7 days also did not change the total blood lipid level The difference between two levels was statistically non-significant (P>O.05).

All homeopathic drugs in this study did not reduce blood total lipids level significantly.

Results indicate that only herbal drug Dolabi significantly reduced blood total lipids level. Thus treatment of diabetics with elevated lipid profile may be acceptable using herbal drugs subject to study of unwanted effects of drugs. The standardization and development of quality control of herbal drugs is another area of study that must be considered before extensive use of herbal drugs.

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