International Journal of Medicinal Plants and Natural Products (IJMPNP)
Volume 1, Issue 1, June 2015, PP 31-39
www.arcjournals.org

Clinical Trial of Poly Herbal Product in the Treatment of Type 2 Diabetes Mellitus

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Abstract:

Background*: Diabetes mellitus, often simply referred to as diabetes, is a group of metabolic diseases in which a person has high blood sugar, either because the body does not produce enough insulin, or because cells do not respond to the insulin that is produced. This high blood sugar produces the classical symptoms of polyuria (frequent urination), polydipsia (increased thirst) and polyphagia (increased hunger) and myalgia.*

Objectives: *The aim of the study is to evaluate the safety and efficacy of Diaboherb in patients with type 2 diabetes mellitus.*

Conclusion: *"Diaboherb" is found effective in treating the type II diabetes patients with positive outcome on the quality of life like Polyuria (frequent urination), Polydipsia (increased thirst) and Polyphagia (increased hunger) and myalgia.*

Keywords: *Diaboherb, Fasting blood glucose, Post Prandial blood glucose and HbA1C.*

1. INTRODUCTION

1.1. Type 2 Diabetes

Diabetes Mellitus type 2 (formerly Non Insulin-Dependent Diabetes Mellitus (NIDDM**)** or adult-onset diabetes) is a metabolic disorder that is characterized by hyperglycemia (high blood sugar).

Type 2 Diabetes Mellitus is characterized by insulin resistance, which may be combined with relatively reduced insulin secretion. The defective responsiveness of body tissues to insulin is believed to involve the insulin receptor. However, the specific defects are not known. Diabetes Mellitus cases due to a known defect are classified separately. Type 2 diabetes is the most common type.

In the early stage of type 2, the predominant abnormality is reduced insulin sensitivity. At this stage, hyperglycemia can be reversed by a variety of measures and medications that improve insulin sensitivity or reduce sugar production by the liver. The classic symptoms are excess thirst, frequent urination, and constant hunger. Type 2 diabetes makes up about 90% of cases of diabetes, with the other 10% due primarily to Diabetes Mellitus type 1 and gestational diabetes. Obesity is thought to be the primary cause of type 2 diabetes in people who are genetically predisposed to the disease.

1.2. The New Breakthrough- Diaboherb

Diaboherb:

Diaboherb is an Herbal Health Supplement which takes care of the complications associated with diabetes, i.e., polyuria, polydipsia, polyphagia, myalgia and complications of diabetes.

The effectiveness of Diaboherb will help diabetic patient of (Type 2) it does help in reducing complications which may lead to serious consequences. To control sugar levels effectively and to get remote from the complications of the diabetes, diaboherb plays a vital role.

1.3. Clinical Trial

"A PROSPECTIVE, RANDOMIZED, DOUBLE BLIND, PLACEBO CONTROLLED, CLINICAL STUDY TO EVALUATE THE EFFICACY AND SAFETY OF DIABOHERB IN PATIENTS WITH TYPE 2 DIABETES MELLITUS"

1.4. Methodology

A prospective, randomized, double blind, placebo controlled proof of concept study enrolled 150 type II diabetic patients, who met the selection criteria.

2. MATERIAL AND METHOD

2.1. Inclusion Criteria

- Males and Females Patients with Type 2 Diabetes Mellitus with age 30–65 year.
- Only new cases with inadequate glucose control.
- Body mass index between 20-35 kg/m2.
- Having fasting blood glucose > 126 mg/dL.
- Post prandial blood glucose > 200 mg/dL.
- Having no serious Physical abnormalities other than those generally associated with type 2 Diabetes Mellitus.
- Patient is willing and able to comply with all trial requirements.
- Ability to understand the Informed Consent and Willing to Sign on informed consent along with audio video visual in accordance with GCP and local legislation.
- Patients able to understand and follow the protocol of the trial.
- Participants who are able to visit the medical institutions throughout the study period.

2.2. Exclusion Criteria

- Patients having Insulin dependent Diabetes Mellitus.
- Having history of hypersensitivity, liver or kidney damage or gastrointestinal disorders, acute infections, diseases of blood or hematopoietic organs
- Pregnant or lactating women
- Patients receiving any concomitant medication, which may have interacted with hypoglycemic action of study drug
- Previous participation in a clinical trial in the last 6 months.
- Subjects who are already taking or have taken in the past 2 months any investigational drug.
- Dehydration by clinical judgment of the investigator.
- Any contraindication to blood sampling.
- Severe asthma that is poorly controlled with medication.

2.3. Ethics Committee Approval

All study related documents Protocol, CRF, Dairy Card, Investigator Brochure, SF – 36 and ICF (English and Kannada versions). Written informed consent was obtained from the subject(s) before the start of the trial and after due approval from the Clinical Independent Ethics Committee for Ethics in Research, Bangalore.

2.4. End Points

Consistent with the primary study objectives, the following endpoints was assessed among study participants

2.5. Primary Endpoints

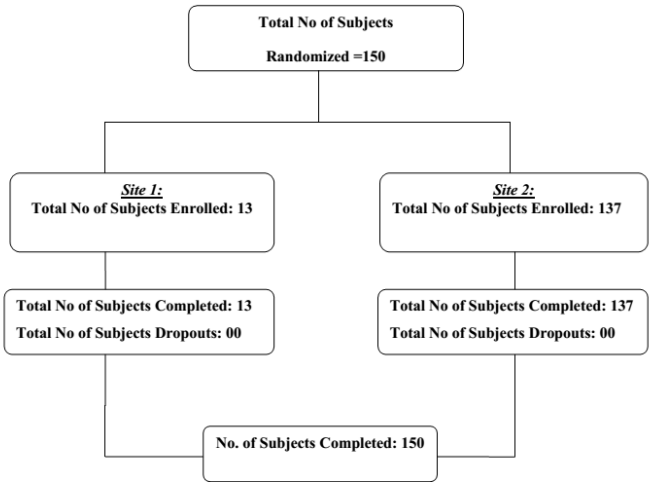
- Changes in Diabetic Panel Investigations.

2.6. Secondary Endpoints

- Incidence and rate of adverse events
- Quality of life questionnaire before and after the treatment (**SF**-36 HEALTH SURVEY)

2.7. Disposition of Subjects

Total of 150 subjects
Drug A: Diaboherb 1 (50 Subjects)
Drug B: Diaboherb 2 (50 Subjects)
Drug C: Placebo (50 Subjects)



2.8. Visit Details

The patients were screened and enrolled. The enrollment day was considered as the baseline data and the patient were asked to visit on: Day 10, Day20, Day30, Day 45, Day 60, Day 75 and Day 90.

2.9. Statistical Analysis

The data was analyzed with 5% significance level and 80 % power for study using SAS. The Two Sample Mean is assessed using paired t-test. The difference between the groups was assessed using One Way ANOVA.

3. RESULTS

3.1. Efficacy Analysis (For Drug A)

3.1.1. Fasting Blood Sugar (mg/dl)

Table. *Fasting Blood Sugar (mg/dl) from Screening to End of Treatment.*

DRUG-A	
Screening Fasting Blood Sugar (mg/dl)	144.698
End of Treatment Fasting Blood Sugar (mg/dl)	134.557
Reduction in mean	10.14
Percentage reduction in mean (%)	7.008

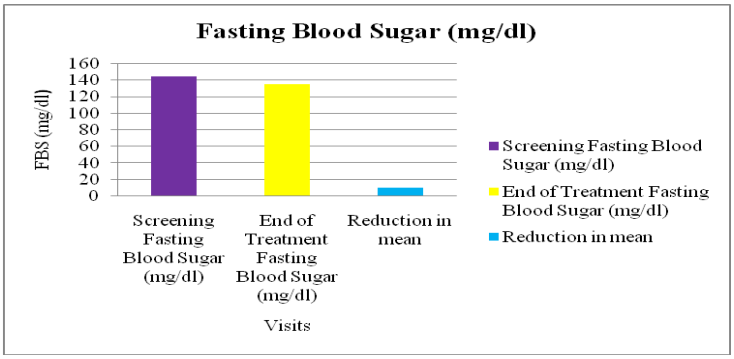


Fig. *Fasting Blood Sugar (mg/dl) from Screening to End of Treatment.*

3.1.2. Post Prandial Blood Sugar (mg/dl)

Table. *Post prandial blood sugar (mg/dl) from Screening to End of Treatment.*

DRUG-A	
Screening Post prandial Blood Sugar (mg/dl)	236.557
End of Treatment Post prandial Blood Sugar (mg/dl)	219.5436
Reduction in mean	17.0134
Percentage reduction in mean (%)	7.192

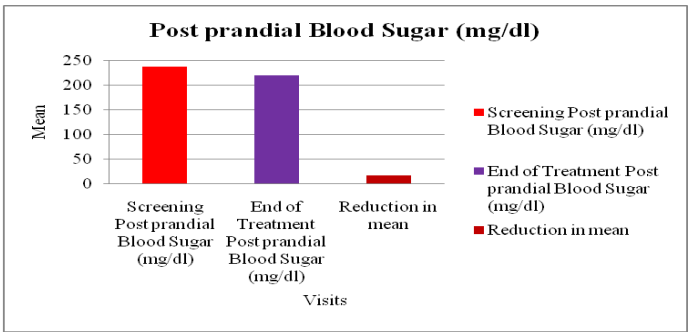


Fig. *Post prandial blood sugar (mg/dl) from Screening to End of Treatment.*

3.1.3. Glycated Hemoglobin (HbA1c)

Table. *Glycated Hemoglobin (HbA1c) (%) from Screening to End of Treatment.*

DRUG-A	
Screening Glycated Hemoglobin (HbA1c) (%)	7.492
End of Treatment Glycated Hemoglobin (HbA1c) (%)	7.372
Reduction in mean	0.12
Percentage reduction in mean (%)	1.602

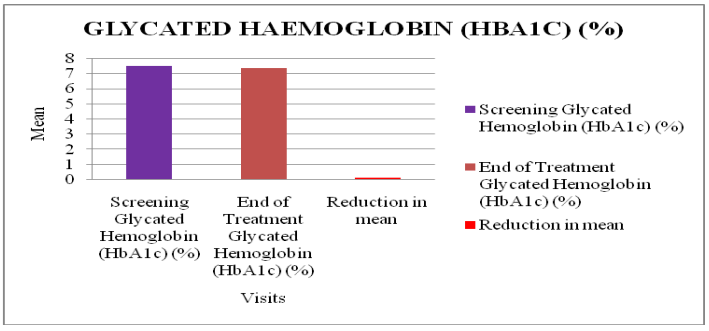


Fig. *Glycated Hemoglobin (HbA1c) (%) from Screening to End of Treatment.*

3.1.4. FBS, PPBS and Hba1c Levels (Drug A)

Table. *Mean Values of FBS, PPBS and HbA1c Levels*

Visit	**FBS (mg/dL)**	**PPBS (mg/dL)**	**HbA1c (%)**
Screening	144.698	236.557	7.492
End of the treatment (Day-90)	134.557	219.543	7.372

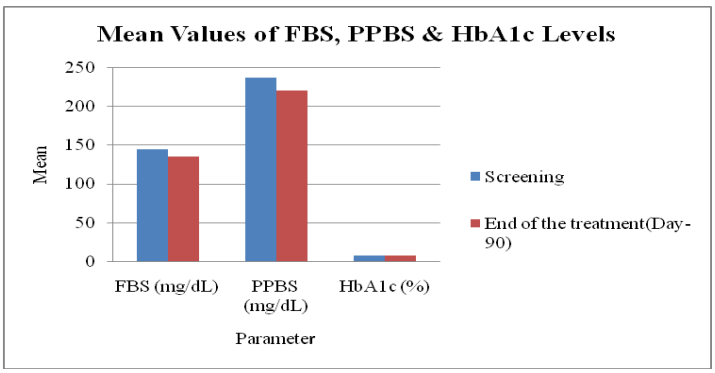


Fig. *Mean Values of FBS, PPBS and HbA1c Levels*

3.1.5. P Value (For Drug A)

P value of FBS, PPBS and HbA1c Levels

P-Value	**FBS**	**PPBS**	**HbA1c**
	P value equals 0.0014	P value is less than 0.0001	P value equals 0.0270
Significance	Very statistically significant	Extremely statistically significant.	Statistically significant

3.1.6. Quality of Life (For Drug A)

The results collected have shown that the Drug A has improvement in the quality of life by the management of symptoms like fatigue, dry mouth, thirst (Polydipsia), excessive urination (Polyuria), hunger (Polyphagia) and myalgia.

3.1.7. Safety Evaluation (For Drug A)

No Adverse events were reported for Drug A

3.2. Efficacy Analysis (For Drug B)

3.2.1. Fasting Blood Sugar (mg/dl)

Table. *Fasting Blood Sugar (mg/dl) from Screening to End of Treatment.*

DRUG-B	
Screening Fasting Blood Sugar (mg/dl)	144.723
End of Treatment Fasting Blood Sugar (mg/dl)	134.277
Reduction in mean	10.446
Percentage reduction in mean (%)	7.218

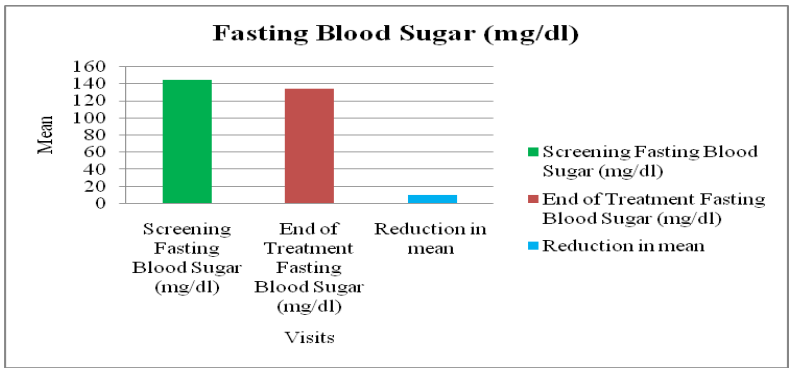


Fig. *Fasting Blood Sugar (mg/dl) from Screening to End of Treatment.*

3.2.2. Post Prandial Blood Sugar (mg/dl)

Table. *Post prandial blood sugar (mg/dl) from Screening to End of Treatment.*

DRUG-B	
Screening Post prandial Blood Sugar (mg/dl)	236.7095
End of Treatment Post prandial Blood Sugar (mg/dl)	219.0473
Reduction in mean	17.6622
Percentage reduction in mean (%)	7.462

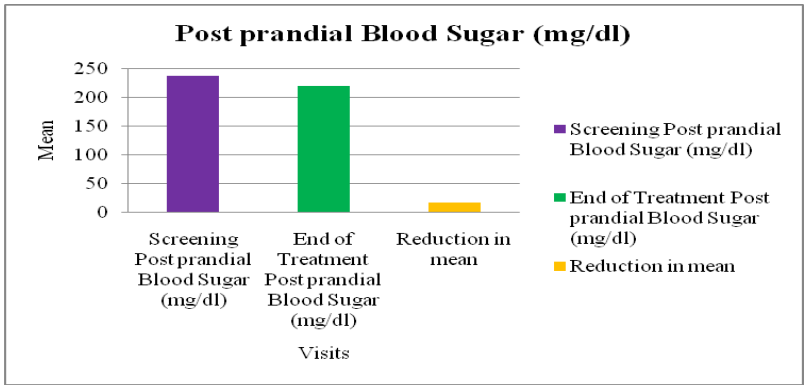


Fig. *Post prandial blood sugar (mg/dl) from Screening to End of Treatment.*

3.2.3. Glycated Hemoglobin (HbA1c)

Table. *Glycated Hemoglobin (HbA1c) (%) from Screening to End of Treatment.*

DRUG-B	
Screening Glycated Hemoglobin (HbA1c) (%)	7.422
End of Treatment Glycated Hemoglobin (HbA1c) (%)	7.256
Reduction in mean	0.166
Percentage reduction in mean (%)	2.237

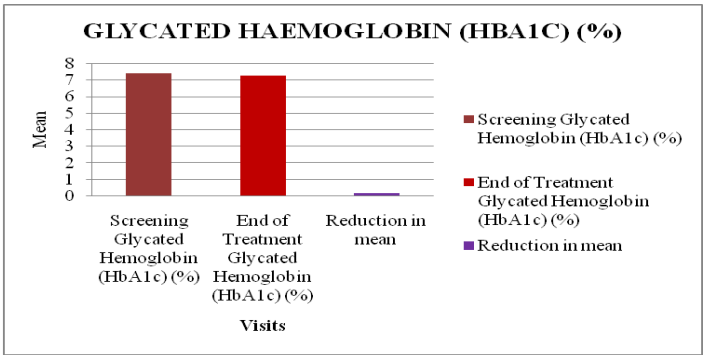


Fig. *Glycated Hemoglobin (HbA1c) (%) from Screening to End of Treatment.*

3.2.4. FBS, PPBS and HbA1c Levels (For Drug B)

Table. *Mean Values of FBS, PPBS and HbA1c Levels*

Visit	**FBS (mg/dL)**	**PPBS (mg/dL)**	**HbA1c (%)**
Screening	144.723	236.7095	7.422
End of the treatment (Day-90)	134.277	219.0473	7.256

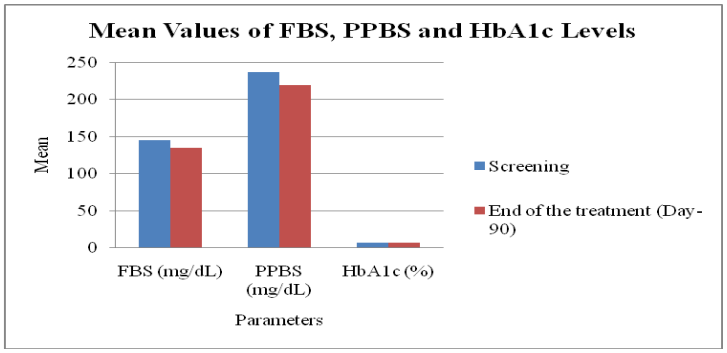


Fig. *Mean Values of FBS, PPBS and HbA1c Levels*

3.2.5. P value (For Drug B)

Table. *P value of FBS, PPBS and HbA1c Levels*

P-Value	**FBS**	**PPBS**	**HbA1c**
	P value equals 0.0010	P value is less than 0.0001	P value equals 0.0157
Significance	Extremely statistically significant.	Extremely statistically significant.	Statistically significant

3.2.6. Quality of Life (For Drug B)

The results collected have shown that the Drug B has significant improvement in the quality of life by the management of symptoms like fatigue, dry mouth, thirst (Polydipsia), excessive urination (Polyuria), hunger (Polyphagia) and myalgia.

3.2.7. Safety Evaluation (For Drug B)

No Adverse events were reported for Drug B

3.3. Efficacy Analysis (For Drug C)

3.3.1. Fasting Blood Sugar (mg/dl)

Table. *Fasting Blood Sugar (mg/dl) from Screening to End of Treatment.*

DRUG-C	
Screening Fasting Blood Sugar (mg/dl)	144.7067
End of Treatment Fasting Blood Sugar (mg/dl)	138.113
Reduction in mean	6.5937
Percentage reduction in mean (%)	4.557

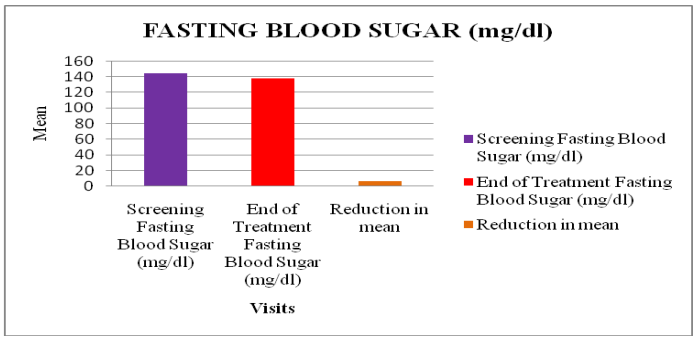


Fig. *Fasting Blood Sugar (mg/dl) from Screening to End of Treatment.*

3.3.2. Post Prandial Blood Sugar (mg/dl)

Table. *Post prandial blood sugar (mg/dl) from Screening to End of Treatment.*

DRUG-C	
Screening Post prandial Blood Sugar (mg/dl)	236.44
End of Treatment Post prandial Blood Sugar (mg/dl)	226.76
Reduction in mean	9.68
Percentage reduction in mean (%)	4.094

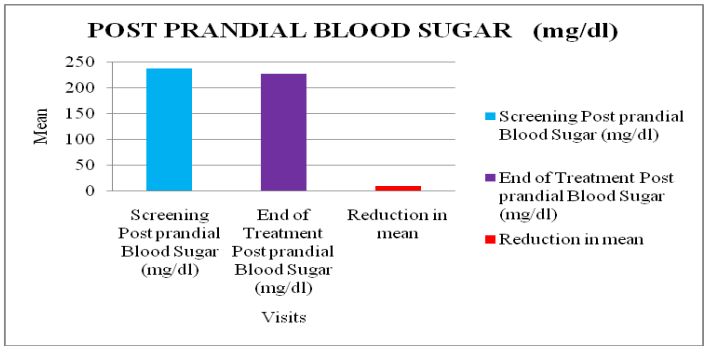


Fig. *Post prandial blood sugar (mg/dl) from Screening to End of Treatment.*

3.3.3. Glycated Hemoglobin (HbA1c)

Table. *Glycated Hemoglobin (HbA1c) (%) from Screening to End of Treatment.*

DRUG-C	
Screening Glycated Hemoglobin (HbA1c) (%)	7.49
End of Treatment Glycated Hemoglobin (HbA1c) (%)	7.44
Reduction in mean	0.05
Percentage reduction in mean (%)	0.67

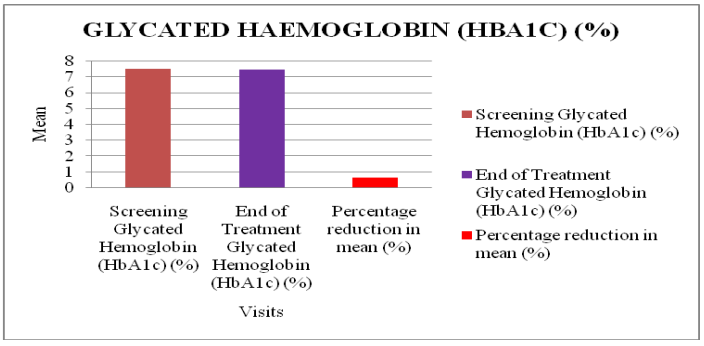


Fig. *Glycated Hemoglobin (HbA1c) (%) from Screening to End of Treatment.*

3.3.4. FBS, PPBS and HbA1c Levels (For Drug C)

Table. *Mean Values of FBS, PPBS and HbA1c Levels*

Visit	**FBS (mg/dL)**	**PPBS (mg/dL)**	**HbA1c (%)**
Screening	144.7067	236.44	7.49
End of the treatment (Day-90)	138.113	226.76	7.44

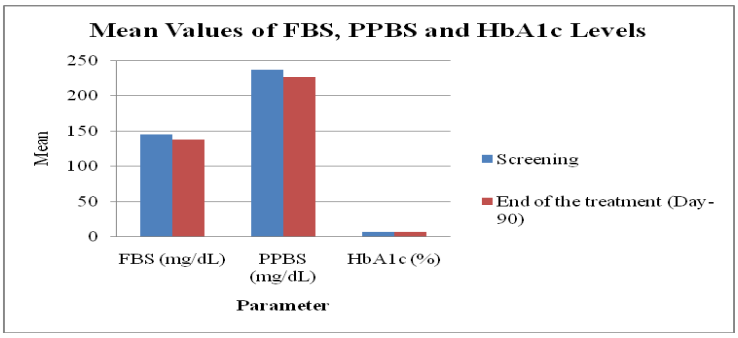


Fig. *Mean Values of FBS, PPBS and HbA1c Levels*

3.3.5. P value (For Drug C)

Table. *P value of FBS, PPBS and HbA1c Levels*

P-Value	**FBS**	**PPBS**	**HbA1c**
	P value equals 0.0627	P value equals 0.0635	P value equals 0.3406
Significance	Not quite statistically significant.	Not quite statistically significant.	Not statistically significant

3.3.6. Quality of Life (For Drug C)

The results collected have shown that the Drug C has no improvement in the quality of life because there is no improvement in the symptoms like fatigue, dry mouth, thirst (Polydipsia), excessive urination (Polyuria), hunger (Polyphagia) and myalgia.

3.3.7. Safety Evaluation (For Drug C)

No Adverse events **were** reported for Drug **C**

4. Discussion & Conclusion

The total number of subjects analyzed in the study is 150, of which 50 subjects were randomly assigned to the Drug A group, 50 subjects were randomly assigned to the Drug B group and 50 subjects to the Drug C group. The subjects were called for screening visit and were given the Informed consent and screening procedures were started. Once the subjects were screen passed, eventually the subjects were randomized in to the group A (Daiboherb 1), group B (Daiboherb 2) and Group C (Placebo Group). The blind was broken after Day 90 when as per the protocol the trial ended.

All individuals, who were included in this study, were analyzed in this report.

The data obtained from the three groups was analyzed statistically using paired t test. The data was compared between the Active Groups (Group A, Group B) and Placebo Group (Group C) for the parameters including reduction in blood sugar levels (FBS, PPBS, HbA1c).

From the data obtained, it was found that the investigational product **Diaboherb** was showing significant percentage of increase in reduction of Fasting Blood Sugar (FBS), Post Prandial Blood Sugar (PPBS) levels and HbA1c levels with no adverse effects, which was considered as an important parameter in diabetic controlling.

References

"Diabetes Blue Circle Symbol". International Diabetes Federation. 17 March 2006.

"About diabetes". World Health Organization. Retrieved 4 April 2014.

"Diabetes Fact sheet N°312". WHO. October 2013. Retrieved 25 March 2014.

Kitabchi, AE; Umpierrez, GE; Miles, JM; Fisher, JN (Jul 2009). "Hyperglycemic crises in adult patients with diabetes.". Diabetes Care **32** (7): 1335–43. doi:10.2337/dc09-9032. PMC 2699725. PMID 19564476.

Shoback, edited by David G. Gardner, Dolores (2011). "Chapter 17". Greenspan's basic & clinical endocrinology (9th ed.). New York: McGraw-Hill Medical. ISBN 0-07-162243-8.

RSSDI textbook of Diabetes Mellitus. (Rev. 2nd ed.). New Delhi: Jaypee Brothers Medical Publishers. 2012. p. 235. ISBN 9789350254899.

"The top 10 causes of death Fact sheet N°310". World Health Organization. Oct 2013.

Rippe, edited by Richard S. Irwin, James M. (2010). Manual of intensive care medicine (5th ed.). Philadelphia: Wolters Kluwer Health/Lippincott Williams & Wilkins. p. 549. ISBN 9780781 799928.

Picot, J; Jones, J; Colquitt, JL; Gospodarevskaya, E; Loveman, E; Baxter, L; Clegg, AJ (September 2009). "The clinical effectiveness and cost-effectiveness of bariatric (weight loss) surgery for obesity: a systematic review and economic evaluation". Health technology assessment (Winchester, England) **13** (41): 1–190, 215–357, iii–iv. doi:10.3310/hta13410. PMID 19726018.

Cash, Jill (2014). Family Practice Guidelines (3rd ed.). Springer. p. 396. ISBN 9780826168757.

Williams textbook of endocrinology (12th ed.). Philadelphia: Elsevier/Saunders. pp. 1371–1435. ISBN 978-1-4377-0324-5.

Shi, Yuankai; Hu, Frank B. "The global implications of diabetes and cancer". The Lancet **383** (9933): 1947–8. doi:10.1016/S0140-6736(14)60886-2. PMID 24910221.

Vos T, Flaxman AD, Naghavi M, Lozano R, Michaud C, Ezzati M, Shibuya K, Salomon JA, Abdalla S, Aboyans V, et al. (Dec 15, 2012). "Years lived with disability (YLDs) for 1160 sequelae of 289 diseases and injuries 1990–2010: a systematic analysis for the Global Burden of Disease Study 2010." Lancet **380** (9859): 2163–96. doi:10.1016/S0140-6736(12)61729-2. PMID 2324 5607.

IDF DIABETES ATLAS (6th ed.). International Diabetes Federation. 2013. p. 7. ISBN 2930229853.

"International Diabetes Federation: Diabetes Atlas". Retrieved 4 April 2014

World Medical Association, 13, ch. du Levant, CIB - Bâtiment A, 01210 Ferney-Voltaire, France;

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