

A TRUE EXPERIMENTAL STUDY TO ASSESS THE EFFECTIVENESS OF CURRY LEAF JUICE ON REDUCTION OF BLOOD GLUCOSE LEVEL AMONG PATIENTS WITH DIABETES MELLITUS AT SELECTED HOSPITAL, PUDUCHERRY

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INTRODUCTION

BACKGROUND OF THE STUDY:

According to **International Diabetes Federation**, an estimated 381 million people had diabetes. Its prevalence is increasing rapidly, and by 2030, this number is estimated to almost double. Diabetes mellitus occurs throughout the world, but is more common (especially type2) in the more developed countries. The greatest increase in prevalence is however, expected to occur in Asia and Africa, where most patients will probably be found by 2030. The increase in incidence in developing countries follows the trend of urbanization and lifestyle changes, perhaps most importantly a “Western-style” diet.

In Ayurvedic medicine, curry leaves are believed to have several medicinal properties such as antidiabetic, antioxidant, anti-inflammatory, antimicrobial, anticarcinogenic and hepato protective properties.

The main nutrients found in curry leaves are carbohydrates, fiber, calcium, phosphorous, iron, magnesium, copper, minerals, nicotinic acid, vitamin C,A,B,&E, antioxidants, plant sterols, amino acids, glycosides & flavonoids.

The long-term effects of diabetes mellitus include progressive development of the specific complication of retinopathy with potential blindness, nephropathy that may lead to renal failure, and/or neuropathy with risk of foot ulcer, amputation Charcot joints and features of autonomic dysfunction including sexual dysfunction. People with diabetes are at increased risk of cardiovascular, peripheral vascular and cerebrovascular disease.

NEED FOR THE STUDY:

India is the diabetes capital of the world with a projected 109 million individuals with diabetes by 2035. The disease currently affects more than 62 million Indians, which is more than 7.1% of Indian's adult population. An estimate shows that nearly one million Indians die due to Diabetes every year. (**Indian Heart Association-2014**)

The average age on onset is 42.5 years. The high incidence is attributed to a combination of genetic susceptibility plus adoption of high-calorie, low-activity lifestyle by Indian's growing middle class. Additionally, a study by the American Diabetes Association reports that India will see the greatest increase in people diagnosed with diabetes by 2030.

Currently the number of cases of diabetes worldwide is estimated to be around 20 million. Among these the greatest number of cases is being reported in India and China 36 million and 24 million respectively. (**International Diabetes Federation**)

The prevalence of diabetes for all age-groups worldwide was estimated to be 2.8% in 2000 and 4.4% in 2030. The total number of people with diabetes is projected to rise from 171 million in 2000 to 366 million in 2030. The prevalence of the diabetes is higher in men than women, but there are more women with diabetes than men.

Ayurvedic research suggests a paste of about 8 to 10 fresh, fully-grown curry leaves taken on an empty stomach in the morning may control non-insulin dependent diabetes mellitus. It also cures diabetes due to obesity as the leaves have weight reducing properties.

There are different modalities of treatment available for Diabetes Mellitus. Among them in India alternative medicine plays an important role, eg: Ayurveda, Homeopathy etc. In Ayurveda herbal extracts from plant roots, leaves, flowers etc are commonly used as a mode of treatment. The role of Ayurveda in control of diabetes is under exploration.

With these projected increase in the diabetic population in future, South-East Asian countries will become the most challenged region in the World and will bear the maximum global burden of the disease in the initial decades of the 21st century. Indeed the number of cases, the options and strategies currently available to treat and prevent its complications is impressive. It remains to be seen if we are able to practically implement these therapeutic strategies so that we ameliorate the enormous health burden and financial burden associated with diabetes. Most of the studies reveal and say about the treatment of complications but very few studies say about management of diabetes mellitus. Looking into the severity of the disease and beneficial effects of this herbal plant in managing diabetes, present study is planned. The above facts triggered the investigator to do an experimental study to assess the effectiveness of curry leaves up on hyperglycemia.

STATEMENT OF THE PROBLEM:

A true experimental study to assess the effectiveness of curry leaf juice on reduction of blood glucose level among patients with diabetes mellitus at selected hospitals, Puducherry.

OBJECTIVES:

- ❖ To assess the pretest level of blood glucose among patients with diabetic mellitus in both control and experimental group.
- ❖ To determine the effectiveness of curry leaf juice on reducing blood glucose level among patients with diabetes mellitus in experimental group.
- ❖ To compare the level of blood glucose among patients with diabetes mellitus in both control and experimental group.
- ❖ To associate the pretest level of blood glucose among patients with diabetes mellitus with selected demographic variables.

OPERATIONAL DEFINITIONS:

ASSESS: In this study it refers to measure the level of blood glucose by using glucometer.

EFFECTIVENESS: In this study it refers to the result of blood glucose level obtained after the administration of curry leaf juice for 7days as measured by the glucometric readings.

DIABETIC PATIENTS: In this study it refers to adults above 40 years who have been diagnosed as having diabetes mellitus by a qualified physician and who are with or without oral hypoglycemic agents.

DIABETES MELLITUS: In this study it refers to increased blood glucose level more than 140mg/dl as a result of disturbance in the oxidation and utilization of glucose which is secondary to a malfunction of the beta cells of the pancreas.

CURRY LEAF JUICE: In this study it refers to the curry leaves is boiled for 15 minutes in 2.5 liters of water till reduces to 2 liters then distributed to experimental group subjects.

HYPOTHESIS:

- ❖ **H₁** : There will be a significant difference in blood glucose between experimental and control group at 0.05 level of significance
- ❖ **H₂** : There will be a significant difference between pretest level of blood glucose and their selected demographic variables of patients with diabetes mellitus in experimental and control group

ASSUMPTION:

The assumptions of the study were:

- ❖ Diabetic patients may have inadequate knowledge regarding consumption of curry leaf juice on reducing blood glucose level.
- ❖ Diabetic patients who are not following healthy life style may get complication.

- ❖ Financial status, Dietary pattern & social support may influence healthy life style among diabetic patients.
- ❖ Ageing, Physical & psychological factors may leads to worsens the condition among diabetic patients.

LIMITATION:

- ❖ Diabetic patients who were taking regular treatment in Aarupadai Veedu Medical College and Hospital, Puducherry.
- ❖ Diabetic patients who were willing participate in the study.
- ❖ Diabetic patients to who were able to communicate in Tamil or English.
- ❖ Diabetic patients who were not having any mental problems or illness.
- ❖ The period of study was limited to 1 week.

MATERIALS AND METHODS:

- ❖ **Research Approach:** Quantitative research approach
- ❖ **Research Design:** A true experimental pretest posttest control group design
- ❖ **Setting:** Aarupadai Veedu Medical College and Hospital, Puducherry.
- ❖ **Population:** Patients with diabetes mellitus who were receiving regular treatment at Aarupadai Veedu Medical College and Hospital, Puducherry.
- ❖ **Variables:**
 - Independent variables - Treatment with curry leaf juice
 - Dependent variables - Level of blood glucose
- ❖ **Sample Size:** 40 patients with diabetes mellitus (20 in experimental group & 20 in control group)
- ❖ **Sampling Technique:** Simple random sampling technique by using lottery method

INCLUSION CRITERIA:

- ❖ Diabetic patients who were receiving treatment in Aarupadai Veedu Medical College and hospital.
- ❖ Diabetic patients who were willing to participate in the study.
- ❖ Diabetic patients who were able to communicate in Tamil or English.
- ❖ Diabetic patients who were available during data collection time.

EXCLUSION CRITERIA:

- ❖ Diabetic patients who were less than 35 years.
- ❖ Diabetic patients who were physically and mentally challenged.
- ❖ Diabetic patients who were critically ill.
- ❖ Diabetic patients with any complication.

DESCRIPTION OF TOOL:

The tool used for data collection was structured interview questionnaire consist of two parts.

Part-1: Demographic variables: It consist of age, gender, residence , religion , marital status , type of family, educational status, occupation, income , diet and source of getting health information .

Part-2: Health profile: It consist of onset of the diabetes mellitus, duration of diabetes mellitus, family history of diabetes mellitus, history of associated illness, increased appetite, increased thirst , increased urination, itching, medications, and exercises.

DATA COLLECTION PROCEDURE:

- ❖ The main study was conducted between 01.04.2016 to 07.04.2016.
- ❖ **First Phase:** Demographic data was obtained and pretest blood glucose was measured from the patients in both experimental and control group using glucometer.
- ❖ **Second Phase:** Curry leaf juice 100 ml twice a day was given to the experimental group subjects in early morning & evening for 7 days.
- ❖ **Third Phase:** Posttest level of blood glucose was measured by glucometer 7 days after intervention in both groups.

MAJOR FINDINGS OF THE STUDY:

1. Findings related to demographic variables by group wise:

- ❖ Majority of the clients (70%) in control and in experimental group (65%) were belongs to the age group of 46 years and above and most them were male in both group.
- ❖ Regarding religion, most of the clients (95%) in control and (100%) in experimental group were Hindu.
- ❖ Among them majority of the client's 75% were married and 55% were living in a nuclear family in control group. In experimental group majority of them 90% were married and 75% were living in nuclear family.
- ❖ Considering education majority of the clients (45%) in the control group had primary education and no formal education and in experimental group (45%) had no formal education.
- ❖ Accomplishing occupational status 55% subjects were working as daily wages/coolie in control group and in experimental group (30%) was working as a daily wages.
- ❖ Regarding diet 100% were taking mixed diet in both control group and experimental group 100% were mixed diet.
- ❖ Majority of the subjects 50% had the family income of less than Rs. 5000 and 70% of them receive the health information through relatives in control group. In experimental group majority of them (65%) had family income of less than Rs. 5000 and 70% of them receive the health information through relatives.

2. Findings related to health profile:

- ❖ Reveals that majority of the diabetic patients 100% had onset of diabetes mellitus above 30 years, 60% with duration of 1-6 years, 65% were not having family history of diabetes mellitus and 45% were living with co-morbidity of diabetes mellitus in both control and experimental group.
- ❖ Accomplishes that majority of the diabetic patients above 50% had the complaints of polydipsia, polyphagia, polyuria, edema and swelling in both control and experimental group.
- ❖ Regarding medication and exercise that majority of the patients 60% were not taking Antidiabetic medications and 65% were not doing any regular exercise in control group. Where as in experimental group 70% were not taking Antidiabetic medications and 75% were taking medications and 75% were not doing any regular exercise.

3. Findings related to pre-test level of blood glucose in control and experimental group:

- ❖ Majority of the clients (45%) had blood glucose level between 200-300mg/dl on pre-test in control group.
- ❖ Reveals that majority of the clients (40%) had blood glucose level between 301-400mg/dl on pre-test in experimental group.

4. Findings related to post-test level of blood glucose in control and experimental group:

- ❖ Accomplishes that majority of clients (40%) had blood glucose level between 200-300mg/dl on post-test in control group.
- ❖ Reveals that majority of clients (45%) had blood glucose level between 200-300mg/dl on post-test in experimental group.

5. Findings related to effectiveness of curry leaves:

- ❖ Clearly shows that in control group didn't have significant impact on tests results by having 'p' value greater than 0.05 level (0.147). But in experimental group which use curry leaves juice has changed the result significantly by having 'p' value <0.000003 which is lesser than 0.05. Thus it depicts that the study was effective on reducing blood glucose level on experimental group.

6. Findings related to association with demographic variables:

- ❖ Shows that analysis of the demographic variables like religion age, gender, marital status, educational status, type of family, occupational status, diet and source of getting health information reveals no association with the level of blood glucose, but monthly income showed at $p<0.05$ (significant), "p" of monthly income = 0.0283 in control group.
- ❖ Accomplishes that the analysis of the demographic variables like Religion, age, gender, marital status, occupational status, monthly income, diet and source of getting health information reveals no association with the level of blood glucose , but type of family and educational status showed at $P<0.05$ (Significant), "p" of type of family = 0.043 and educational status = 0.045 in experimental group.

NURSING IMPLICATIONS:

The implications of the finding have been discussed in relation to nursing education, nursing practice, nursing administration and nursing research.

NURSING EDUCATION:

- ❖ Nursing education need to be strengthened to enable nursing students to know about current knowledge on diabetes mellitus and utilize evidence based findings (experimental study to enhance prevention of diabetes complications) to promote prevention of diabetic complications among patients with diabetes mellitus.
- ❖ Nursing curriculum should provide clinical experience regarding conduction of study in various settings. A systematic patient education programme can be emphasized by the institution and incorporated in the curriculum.
- ❖ Nursing curriculum should incorporate the naturopathy treatment and its benefits for various disease conditions in the nursing syllabus.

NURSING PRACTICE:

- ❖ Nurses play an important role in promotive, curative, and preventive aspects of health care system. Nurses should render research for various diabetes mellitus patient in the hospital and community. The nurse working in the hospital should provide health education. They should be planned teaching aspects from individual teaching to mass educational programme.
- ❖ Nurses should make the diabetes mellitus patient to become aware of the prevention of diabetic complications through plant and effectiveness of curry leaves juice forth on the findings of the study can be disseminated to motivate nurse plan step for prevention of diabetes mellitus complications.

NURSING ADMINISTRATION:

- ❖ The nurse administrator in the hospital should develop guidelines for conducting the study for diabetes mellitus patients and encourage practice of the guidelines by nurses in the hospital to prevent the complications among patients with diabetes mellitus. Continuous quality assessment can be done by the hospital in order to assess and prevent microvascular and macrovascular complications of diabetes mellitus.
- ❖ In service education must be provided to all nurses to update the knowledge on diabetes mellitus.
- ❖ Pamphlets, hand-outs patient booklets regarding diabetes mellitus should be kept at diabetes clinic for this use patients and attendance and significant others

NURSING RESEARCH:

- ❖ The findings of the study serve as a basis for the nursing professional and the student to conduct further studies in different aspect of diabetes mellitus treatment like complaints, diet, exercise, foot care, eye care and self-administration of insulin.

CONCLUSION:

Assessed effectiveness of curry leaves juice on reducing blood glucose level among patients with diabetes mellitus. The study revealed that (40%) of clients pre-test level of blood glucose between 301-400 mg/dl, were reduced to 200-300 mg/dl (45%) on post-test in experimental group. But there was no change in control group. It also depicts that use of curry leaves juice has changed the result significantly in experimental group by having ‘p’ value <0.00003 which is lesser than 0.05. Thus the study was highly effective in reducing blood glucose level among patients with diabetes mellitus.

BIBLIOGRAPHY

JOURNAL REFERENCES :

- ❖ **Sarah.W,Gojka.R,Anders.G,RichardS,KingHilary, (2004).** Global prevalence of diabetes, Journal of diabetes care, 2004 May,27(5); 1047.
- ❖ **Shasank.L(2001).** Rising global burden of diabetes, The Asian Journal of Diabetology, May 3 (4): 25-27.
- ❖ **Pennock.T(2005),** Diabetes and nutrition, Journal of diabetes. April.101 (2); 28-31.
- ❖ **GirishKumar.V,Ravindra.J.P, (2004)**All Indian Journal of pharmacology. April. 48(3); 398-352
- ❖ **Iyer.M,Mani.V(1990),** Studies on the effect of curry leaves supplementation on lipid profile,glycated proteins and amino acids in non-insulin dependent diabetic patients. Plant foods for human nutrition;September. 40(4) ;275- 282.
- ❖ **Barbara.A.(2001).** Prevention of type 2 diabetes mellitus, British medical Journal. 32(3) ; 63 – 66.
- ❖ **Sheila.J,AnnaR.**Hypoglycaemic effects of curry leaves powder on diabetic subjects. The Indian journal of nutritional dietetics.3(42). 22- 29
- ❖ **Abdel-Barry J. A, Abdel-Hassan I A&H.Al-Hakiem(1997),**Hypoglycemic and antihyperglycemic effects of Trigonellafoenum-graecum leaf in normal and alloxan induced diabetic rats. Journal of Ethnopharmacology. 58(3): 149-155.
- ❖ **Adachi,T.andX.L.Wang(1998),** Association of extracellular-superoxide dismutase phenotype with the endothelial constitutive nitric oxide synthase polymorphism, FEBSLett. 433:166-168.
- ❖ **AimanR(1970),** Recent research in indigenous antidiabetic medicinal plants: An overall assessment. Indian J. Physiol and Pharmcol. 14: 65-76.
- ❖ **AjitKar B K and N G Choudhary(2003).** Comparative evaluation of hypoglycaemic activity of some Indian medicinal plants in alloxan diabetic rats. Journal of ethnopharmacology, 84: 105-108.
- ❖ **Alarcon Aguilara, FJRoman Ramos, R Perez-Gutierrez, S Aguilar-Contreras A, Contreras-Weber C Cand J L Flores-Saenz(1998).** Study of the antihyperglycemic effect of plants used as antidiabetic. J Ethnopharmacol. 20:470-475.

- ❖ Ali-Emmanuel N, Moudachirou, M Akakpo and J. Quetin-Leclercq (2002). Invitro antimicrobial activity of Cassia alata, Lantana camara and Mitracarpus scaber against Dermatophilus congolensis isolated in Benin. Revue d'Elevage et de Medecine Veterinaire des Pays-Tropicaux. 55(3): 183-187.
- ❖ Allain C C, Poon L, Chan SG, Richmond, Wand P, Fu (1974) Enzymatic determination of total serum cholesterol. Clin. Chem. 20: 470.

ONLINE REFERENCES:

- ❖ www.oxfordjournal.org.
- ❖ www.indianjournal.com
- ❖ www.elsevier.com
- ❖ www.ein.org
- ❖ www.pubmed.com
- ❖ www.growthhouse.org/natal.html.
- ❖ www.nursingresearchonline.com
- ❖ www.cinahl.com
- ❖ http://www.lcweb.loc.gov/nls.
- ❖ http://www.niddk.nih.gov.
- ❖ http://www.medicalert.org.
- ❖ http://www.who.int/mediacentre/factsheets/fs312/en/
- ❖ http://www.ncbi.nlm.nih.gov
- ❖ http://www.cdc.gov/diabetes/pubs/factsheet.htm.
- ❖ http://www.diabetes.org.