

# To Ascertain the Efficacy of Berberis Vulgaris 6c in Controlling the Glycaemic Index of Type-2 Diabetes Mellitus

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## ABSTRACT

Diabetes mellitus is one of the major endocrinological disorder witnessed even among the younger generation of the people now a days. It has become the major health condition that is prevailing worldwide and mostly in India. The 4<sup>th</sup> -6<sup>th</sup> decades are mostly affected; major causes are due to dietary and lifestyle factors. Obesity is the main cause, Homoeopathy has a great number of remedies that are suited to this condition like Syzigium, Uranium nitricum, Phosphoric acid, Gymnema etc. But as the active principle from the root extract of Berberis vulgaris is used in treatment of diabetes in other systems of medicine, Berberis is said to have the active principle Berberine that have the effects of lowering the glycaemic index of the diabetic individuals. I am willing to test the efficacy of berberis vulgaris homeopathically in type 2 diabetes mellitus.

**Keywords:** Diabetes mellitus, Berberis vulgaris, glycaemic index, HbA1c tests.

## INTRODUCTION

Diabetes mellitus is one of the most common and the pre-eminent health condition prevailing in India. Type 2 Diabetes mellitus is a heterogenous disorder. According to WHO, diabetes mellitus formerly also called

as non-insulin dependent diabetes. It is a condition associated with disturbance in metabolism of carbohydrates, fat and protein coupled with relative insulin deficiency<sup>[5]</sup>. Our great India, is the 5<sup>th</sup> capital of diabetic in world. As per the statistical analysis made by WHO, it says that about 40 million people are diabetic and it will increase to 70 million by 2025<sup>[7]</sup>.

Diabetes mellitus is an endocrinological disorder which is characterized mainly with increased glycaemic levels and insulin resistance, it establishes as initial insulin resistance which leads to elevated insulin secretion in order to maintain the glucose levels in the body, as the pancreatic beta cells that produce insulin are damaged then the elevated insulin secretion is followed by insulin deficiency which readily leads to impaired blood glucose metabolism and result in high blood sugar levels which is called diabetes.<sup>[5]</sup>

Glycaemia or Diabetes are classified in to pre-diabetes and diabetes. Diabetes can be occurred due to metabolic errors of diet, lack of sufficient exercise and lifestyle of an individuals.<sup>[8]</sup> Now a days the sedentary lifestyles and eating patterns of the young generations are main important cause of the risk to obesity which is the main risk factor in cases of diabetes. Diabetes can also be occurred in pregnancy condition called gestational diabetes which goes off after

pregnancy, it is a transient hyperglycemic state. Such transient hyperglycemia can also be occurred due to stress called stress hyperglycemia -which usually occur due to imbalance in cortisol and catecholamines that antagonizes the action of insulin due to stress, which vanishes itself after the recovery from an acute illness. Diabetes can be occurred due to various causes like genetic predisposition, occurs usually in middle aged and older individuals usually the 5<sup>th</sup> and 6<sup>th</sup> decades, but in recent times it is common in younger too. Diabetes can be diagnosed by various methods such as Random blood glucose (RBS), Fasting blood glucose levels (FBS), Glycated hemoglobin {HbA1c}and glucometers. It can be diagnosed when either FBS >126mg/dl or RBS> 200mg/dl Or HbA1c values >48mmol/mol.

Type 2 Diabetes mellitus is the major health concerns the disturbance in fat protein and glucose metabolism with relative insulin resistance and further insulin deficiency resulting in increased glycemic levels, and it is easily prone to complications like peripheral neuropathy, nephropathy and retinopathy. Proper treatment for glycemic control is needed to slow down these complications. All we can do is to prevent complications and treat diabetes and reduce the risk of mortality and morbidity. Although the effective and generous treatments are available for diabetes, we need to explore more possibilities. Allopathic system of medicine uses drugs like metformin, sulfonylureas, meglitinides etc., even by these drugs some patients have uncontrolled glycemic controls which is difficult in resulting the antidiabetic effects thus decreasing adverse complications. Hence, most of the populations are opting systems of medicine like homoeopathy. Homeopathy has a great scope in cases of diabetes mellitus.

**GLYCATED HAEMOGLOBIN:** - It is an accurate measure of glycemic control of an individual. It is directly related to the proportion of the blood glucose

concentration of the respective individual. It reflects the glucose control over RBC; hence it is the most accurate test to know a person's glucose levels that can diagnose the diabetes. Glycated hemoglobin is an accurate test to know the sugar levels in the body as they reflect the glucose values on RBC. This test is quite performed every 3 months, it reflects the glucose levels from past 3 months, this is called glycemic index.<sup>[5]</sup>

Diet plays a major role in Diabetic individuals to control and keep them in normal ranges like, avoidance of alcohol and eating foods rich in fiber and protein and less carbohydrates, preferring boiled vegetables over smoked. Life style modifications like maintaining their weight in cases of obesity, maximum avoidance of sedentary lifestyle and more physical exercises. These two measures are enough when there are initial levels of the disease and it can be managed easily. The further stages demand the drugs and then followed by rehabilitations.

In recent years many studies have been taking place and the *Berberis vulgaris* has berberine which is an isoquinole alkaloid which has antioxidant, anti-inflammatory, hypotensive properties and there are recent researches on using berberis as herbal medication has hypoglycemic and hypolipidemic effects.

#### **NEED FOR THE STUDY**

*Berberis vulgaris* is having the alkaloid called Berberine which is obtained in the roots of the plant used as a supplementation to the diabetes in other systems of medicine it is said to be equivalent in the treatment as metformin. Hence out of my interest I want to know the effectiveness of berberis vulgaris action homoeopathically on diabetes.

To our knowledge, we are not aware of the idea that berberis vulgaris acting on diabetic individuals, helps in reducing their glycemic levels, the active principle is said to act by increasing insulin levels and promoting metabolism and reducing lipid levels and maintaining the body fat. As far we know these studies occurred by administering crude doses, by giving juice extracts of the

roots of plant. Hence a study homeopathically is required on this topic, to complete the areas where we couldn't reach. Therefore, I am keen to know and investigate the effects of berberis vulgaris on glycemic levels, whether they could act or not. Thus, I could help by recruiting some information regarding this area, that helps treat individuals improving their quality of life and removing their stress related to health condition and to lead a normal life.

#### **AIMS AND OBJECTIVES: -**

To investigate the effects of berberis vulgaris 6c in controlling the respective glycemic index of patients residing in Sangareddy.

#### **LITERATURE REVIEW**

- Diabetes is slowly growing pandemic in both developed and developing countries too, it is often addressed before as a rich man's disease but now it occurs in low socio-economic status categories too. Type 2 diabetes mellitus often occurs due to dietary and lifestyle errors. There is increased turn in to homoeopathic approach of the treatment as it has its best effect on the disease directing to the cure of the patient.<sup>[6]</sup>
- A study was done to know whether there was definite role of homoeopathy in management of diabetes and discussed about the success of homoeopathic medicines on the basis of susceptibility was recorded.<sup>[2]</sup>
- There is a national programme for diabetes which is National Programme For Prevention And Control Of Cancer, Diabetes, Cardiovascular Diseases And Stroke.<sup>[29]</sup>
- Many traditional plants are used in the treatment of diabetes by extracts of their phytomolecules which have active substances and alkaloids that are used in alternative methods of treatment and medical formulations. Our remedies like Allium cepa, Allium sativum, Berberis vulgaris Cassia alata is used traditionally in diabetic conditions in treatment of diabetes.<sup>[25]</sup>

#### **HOMOEOPATHIC APPROACH**

According to allopath's Diabetes is a lifelong disease and can't be cured, and they go on with oral hypoglycemic agents' diet and lifestyle modifications. But we homoeopaths believe that it's not the organ but the man as a whole is diseased helps us in selecting the totality and following individualization helps in selection of the similimum that help in cure.

Diabetes Mellitus has immense approach by homoeopathy. According to H.A Roberts in his philosophy in chapter "Homoeopathy and endocrinology" mentions that any organ doesn't damage to the extent that it can't be recovered. He says that modern medicine like insulin therapy on diabetes first even though it acts by reducing sugar levels later makes the organ inefficient to make insulin there by further causing increase in sugar levels. Hence, he advises us to follow the homoeopathic medicine that aids in with nature for cure. He concludes that organ is not totally damaged we can improve the function of the organ by our remedies.<sup>[28]</sup>

A study in Hong Kong private clinic stated that individual homeopathic treatment is effective than conventional treatment in treating the glycemic indices of the patients. This study revealed that the poor uncontrolled diabetes can also be managed using homoeopathy.<sup>[24]</sup>

Homoeopathic remedies like Syzgium jambolonum, Uranium nitricum, Cephalandra indica, Phosphoric acid, Gymnema sylvestre, Abroma augusta are some of the common remedies used in day-to-day practice of homoeopaths. Homoeopathic remedies aided with needed dietary errors and life style modifications.<sup>[16]</sup>

- **URANIUM NITRICUM:** - Diabetes with increased frequency to urination and glycosuria with weakness and debility and great emaciation. Polyuria with great thirst and dryness of mouth. Glycosuria without any cause. All the symptoms are aggravated at night.
- **CEPHALANDRA INDICA:** - Diabetes with loss of appetite, giddiness of the

head burning thirst and skin complaints with weakness and debility with disinclination to do any work. Weakness after urination.

- GYMNEMA SYLVESTRE: - Diabetes with sexual weakness and skin complaints especially diabetic carbuncles and boils with weakness and increased frequency to urinate, burning sensation.
- PHOSPHORIC ACID: - Diabetes with increased burning thirst and increased frequency to urinate at night. Milky urine. Diabetes in old aged with increased sexual debility. Mental debility followed by physical debility. Craves juicy things with indifference to affairs of the life.<sup>[30]</sup>
- ABROMA AUGUSTA: - Diabetes with sleeplessness, loss of appetite with great burning thirst and dryness of mouth, increased frequency to urination followed by weakness. Profuse burning micturition with irregular catamenia.
- SYZIGIUM JAMBOLONUM: - Syzgium indicated when there is dry mouth with great thirst with weakness and profuse urination with emaciation and prickly heat in the upper part of the body. There are small red pimples with itching. Longstanding cases of diabetes with increased perspiration and tendency to diabetic ulcers. Sometimes it can be given even in cases where just diabetes is the only complaints we get from patient, and help in reducing sugar levels.

#### **BERBERIS VULGARIS: -**

Berberis vulgaris: - commonly called as Barbery, Belong to family Berberidaceae.

This plant is a deciduous evergreen shrub, that grows usually in European countries and North Asia.

This plant is 3-8 feet high; fruits are small scarlet color with acrid taste. Mother tincture is prepared from the bark of the root.<sup>[27]</sup>

It mainly acts on the urinary organs, kidneys and also joints, liver and gallbladder.

Active principle: - Berberine is the active principle. Berberine has many traditional uses, its root extract is used as antidiabetic,

controls the lipids and triglycerides metabolism.

#### **TRADITIONAL USES:**

The plant is used in Iranian traditional medicine to cure jaundice, asthma, toothache, skin pigmentation and hepatosplenomegaly scorbutic gums, depression Alzheimer's disease kidney stones rheumatism gout and diabetes mellitus. Various species of berberidaceae family are also helpful in treating diabetes on basis of Iranian medicine.<sup>[21]</sup>

The berberine isoquinol alkaloid acts on the body improving insulin levels and promoting metabolism in the body, especially glycolysis reflecting as the lowered glycemic indices and lipid levels of the body therefore showing us antidiabetic and hypolipidemic properties when applied as a crude form or the juice extract.<sup>[20]</sup>

#### **HOMOEOPATHIC ACTION:**

According to the proving, Berberis has few symptoms or conditions where it is used like renal calculi, gallbladder calculi biliary colic, liver troubles it also affects spermatic cord of males and vaginismus in females.

According to J.H CLARKE and HERING, berberis vulgaris have few symptoms of diabetes like

1. Burning increased thirst, with dryness of mouth<sup>[3]</sup>
2. Want of hunger or increased appetite
3. Urinary troubles like frequent urge to urinate.
4. Weakness and debility are marked.<sup>[4]</sup>

By the above symptoms it may be indicated in diabetes condition.

#### **According to several studies.,**

- Zaheja Sujee in their study described about complex homeopathic formulations and use this as the cooperative therapy against the main stream treatment of diabetes. This type of formulations is against homoeopathic similia and are not encouraged as the treatment. Although the individual drugs tremendously act on the condition mixed

formulations are against the principles and even though they act they may be palliative but not as a curative basis.<sup>[22]</sup>

- Aditya Dilipkumar Patil, Charusheela Dilipkumar Patil, Dilipkumar Kondiba Patil (2021 ) studied on Evaluation of anti hyperglycemic potential of homoeopathic medicines insulinum , pancreatinum and uranium nitricum in streptozotocin induced diabetic rats these rats have shown their individual hypoglycemic effects on diabetic rats significantly.<sup>[23]</sup>
- Berberis vulgaris which is prepared from the bark of root have many traditional uses which may be hypoglycemic and reducing the glycaemic indices especially says the recent studies.
- Nawel Meliani, Mohamed El Amine Dib and others in their study was explaining the positive effect of berberis vulgaris on diabetic rats that there was marked hypoglycemic effect and there was decrease in triglyceride content and cholesterol.<sup>[1]</sup>
- Ladan Tahmasebi, Mehrnoosh Zakerksh, Fereshteh Golfakhrabadi, Foroogh Namjoyan (2018) in his study concluded that berberis vulgaris has marked action on FBS and HbA1c values which can be a parameter in the studies. Berberis vulgaris root extract decreased FBS, fasting insulin, total cholesterol decreased.<sup>[11]</sup>
- Jun Yin, Huili Xing , Jianping Ye (2008) in their study stated by berberine supplementation there is significant decrease in HbA1c and lowered the blood glucose. It regulates glucose metabolism and it manages lipid profile and some side effects of gastrointestinal disturbances have been observed.<sup>[31]</sup>
- Jamshid Tabeshpour, Moshen Imenshashadi and Hossein in his study mentioned about berberis vulgaris having various actions on metabolism, It decreases weight, enhance insulin sensitivity, decreased insulin resistance, decreased blood glucose in genetic models of type2 Diabetes mellitus. It decreases serum cholesterol, triglyceride, LDL-C in animals. It acts on AMP activated protein kinase and increase AMP/ATP ratio results in anti-obese activity. It inhibits mitochondrial function resulting in upregulation of glucose <sup>[14]</sup>.
- Mojan Sanjari and others in their study have shown the effects of other species of Berberidaceae that is Berberis integrima also have been compared to metformin in antidiabetic activity. It was effective as metformin in decreased blood glucose but also induced weight loss <sup>[10]</sup>.
- Rasool Soltani, Syed Mustafa in their study have mentioned that berberis integrima species fruit extract inhibits gluconeogenesis in liver and therefore decreasing glycaemic control that is FBS and HbA1c, therefore, might be effective as complementary therapy in diabetic patient. Hence therefore Berberine active component in decreased glycaemic index. Berberis integrima is more effective than Berberis vulgaris in controlling glycaemic index.<sup>[12]</sup>
- Fatemeh Lazavi, Parvin Mirmiran mentioned about the effects of Barbery on cardiovascular risk factors in type2 Diabetes mellitus that it might decrease the risk factor of cardiovascular disease in Diabetes mellitus patient by maintaining lipid metabolism decreasing FBS, blood pressure, lipid levels and HbA1c and thus reduces risk of cardiovascular diseases <sup>[9]</sup>.
- Farzad shidfar and Shima Seyyed in their studied the effects of berberis vulgaris fruit extract on serum parameters of diabetes like lipoproteins, homocysteine glycaemic control and antioxidant capacities stating there is decrease in the parameters without any dietary of lifestyle changes. They concluded that there is decrease in HbA1c values.<sup>[13]</sup>
- Aram Khashayar, Zahra Bahari conducted study on animals and humans as clinical trials revealed the effects of berberis vulgaris active principle berberine in diabetes mellitus and

metabolic diseases by decreasing the glycemic indices and triglyceride contents.<sup>[15]</sup>

- Homeira Rashidi, Foroogh Namjoyan in their study mentioned that, Berberine in patients with poor beta cell functions is said to improve the insulin activity and improve the glucose metabolism rendering in decreasing the glycemic index of the patients.<sup>[17]</sup>
- Zolikhha Moazezi , Durdi Qujeq (2021 ) studied on Berberis fruit extract and biochemical parameters in patients with type 2 diabetes measured by spectrophotometric method revealed that it was effective in decreasing the HbA1c values i.e., the glycemic index of the patients during the course of the study.<sup>[18]</sup>
- Nahid Bijeh, Tohid Mahout Moghadam, Mohamad Shahin (2015) studied on Effect of berberis vulgaris supplementation on glycemic indices patients with diabetes type 2 after one session of aerobic exercise have concluded that berberis supplementation after one session of aerobic exercise have independent results in glycemic indices, they stated that both berberis supplementation and aerobic exercise combined would show major effects than individual application on the patients. This indicates decreasing glucose concentration and insulin resistance promoting metabolism.<sup>[19]</sup>
- Zara Safari , Amirhosein Farrokhzad , Abed Ghavami , Abdulmnannan Fadel , Amir Hadi , Sahar Rafiee , Amin Mokari-Yamchi , Gholamreza Askari (2020) studied on The effect of barberry [berberis vulgaris l.]on glycemic indices a systematic review and meta-analysis of randomized control trials have shown that the supplementation of berberis vulgaris juice extract on the diabetic individuals does improve insulin levels but did not decrease the glycemic indices that considerably.<sup>[26]</sup>

## **MATERIALS & METHODS**

The Present “Experimental study on assessing the effectiveness of berberis vulgaris in controlling the glycemic index of type 2 diabetes mellitus includes:

**TYPE OF STUDY AND STUDY DESIGN:** It is an Experimental pilot study conducted from the period of February 2022 to July 2022. We had followed uncontrolled experimental study design.

**SAMPLE SIZE AND STUDY POPULATION:** A Sample size of 30 cases have been taken from the various areas of people residing in Sangareddy.

**SELECTION CRITERIA:**

**INCLUSION CRITERIA:**

1. Patients with uncontrolled type 2 diabetes mellitus on conventional treatment have been taken.
2. Patients with glycemic index between 6-11% have been considered.
3. Both sexes between age group of 30-60 years are mostly included.

**EXCLUSION CRITERIA: -**

Patients who are using insulin therapy and who have co-existing complications are excluded from this study.

**DURATION OF STUDY: -** 4 to 6 months

**DATA COLLECTION PROCEDURES AND INSTRUMENTS USED: -**

The details of the study are clearly explained to the patient about the outcome of the study and written consent has been taken from each patient, before the study.

**COLLECTION OF DATA: -** One standard Case Proforma has been maintained and the glycemic index of the patients by their respective HbA1c values are taken in to consideration.

**CONFIDENTIALITY: -** All records of participation are kept strictly confidential and private. Only I and my guide has had the

access to the information. Information about the project has not been made public in any way that identifies the participants.

**QUALITY CONTROL: -**

Berberis vulgaris drug is procured from GMP certified pharmaceutical companies approved by the IEC, Drugs are stored as per the rules of INDIAN HOMOEOPATHIC PHARMACOPIEA.

I have assessed the improvement of the patients according to their HbA1c values before and after using Berberis vulgaris 6c. The repetition of the drug was done thrice every week.

**PLAN OF STUDY /STATISTICAL TOOL: -**

In my study, I have used paired t test as a plan of analysis or statistical tool.

**SELECTION OF TOOL: -**

The standard MNRHMC case proforma.

Assessment of the respective HbA1c values for evaluating the prognosis of the case.

**ETHICAL CONSIDERATION: -** Ethical clearance from the institutional ethics has been taken, written consent of the participants has been taken by the participants & explained in their own language.

**STATISTICAL ANALYSIS**

After collection and presentation of patient’s data, analysis of data is the next important step. To draw valid conclusion, analysis of collected data is done below with the use of statistical methods to put into a scientific parameter. As the sample size is not more than 30, and it is based on comparing before and after results. So, the obtained data is subjected to Paired “t- test”.

Analysis is based on the glycemic indices of the patients.

S.NO	BEFORE TREATMENT	AFTER TREATMENT	DIFFERENCE D	d	(D-d)	(D-d) <sup>2</sup>
1	8.0	7.8	0.2	0.2733	-0.0733	0.0053
2	6.5	6.2	0.3	0.2733	0.0267	0.0007
3	8.3	8.5	-0.2	0.2733	-0.4733	0.2240
4	6.9	6.1	0.8	0.2733	0.5267	0.2774
5	7.2	6.9	0.3	0.2733	0.0267	0.0007
6	8.1	7.7	0.4	0.2733	0.1267	0.0160
7	7.7	6.5	1.2	0.2733	0.9267	0.8587
8	7.8	7.2	0.6	0.2733	0.3267	0.1067
9	8.3	7.5	0.8	0.2733	0.5267	0.2774
10	7.0	8.8	- 1.8	0.2733	-2.0733	4.2985
11	7.3	7.8	-0.5	0.2733	-0.7733	0.5979
12	7.6	7.3	0.3	0.2733	0.0267	0.0007
13	10.0	9.8	0.2	0.2733	-0.0733	0.0053
14	8.3	7.9	0.4	0.2733	0.1267	0.0160
15	7.2	6.9	0.3	0.2733	0.0267	0.0007
16	7.8	7.8	0	0.2733	-0.2733	0.07461
17	9.0	8.2	0.8	0.2733	0.5267	0.2774
18	8.1	7.4	0.7	0.2733	0.4267	0.1820
19	8.7	9.0	- 0.3	0.2733	-0.5733	0.3286
20	7.8	7.8	0	0.2733	-0.2733	0.0746
21	8.9	8.7	0.2	0.2733	-0.0733	0.0053
22	7.9	6.8	1.1	0.2733	0.8267	0.6834
23	6.8	7.5	-0.7	0.2733	-0.9733	0.9473
24	8.5	7.7	1.2	0.2733	0.9267	0.8587
25	6.9	6.4	0.4	0.2733	0.1267	0.0160
26	7.5	7.3	0.2	0.2733	-0.0733	0.0053
27	6.3	6.2	0.1	0.2733	-0.1733	0.0300

28	8.1	7.9	0.2	0.2733	-0.0733	0.0053
29	7.4	6.7	0.7	0.2733	0.4267	0.1820
30	7.6	7.9	0.3	0.2733	0.0267	0.0007
			TOTAL( $\Sigma D$ ) =8.2			TOTAL ( $\Sigma D-d$ ) <sup>2</sup> = 10.357

	Paired difference					t	df	p value
	Mean	Standard deviation	Standard error Mean	95% confidence interval				
				upper	Lower			
Paired test before and after	0.257	Before 0.811 After 0.833	0.111	0.484	0.30	2.3129	29	0.0280

**HYPOTHESIS: -**

**NULL HYPOTHESIS: -**

There is no effect on the glycaemic index before and after treatment with Berberis vulgaris in type 2 Diabetic patients.

**RESEARCH HYPOTHESIS: -**

There is an effect on the glycaemic index before and after treatment with Berberis vulgaris in type 2 Diabetic patients. And thus, Berberis vulgaris is effective in treatment of type 2 Diabetes mellitus by reducing glycaemic indices.

**INFERENCE:**

Table value at 't' 29 degree of freedom and 5% significance is 2.045, and the calculated

value is 2.3129. The p value obtained is 0.0280, So null hypothesis (H0) is rejected and alternate or research hypothesis (H1) is accepted. i.e., there is difference in the glycaemic indices of the type 2 Diabetic patients before and after treatment. This shows that berberis vulgaris is effective in controlling the glycaemic index of type 2 diabetes mellitus.

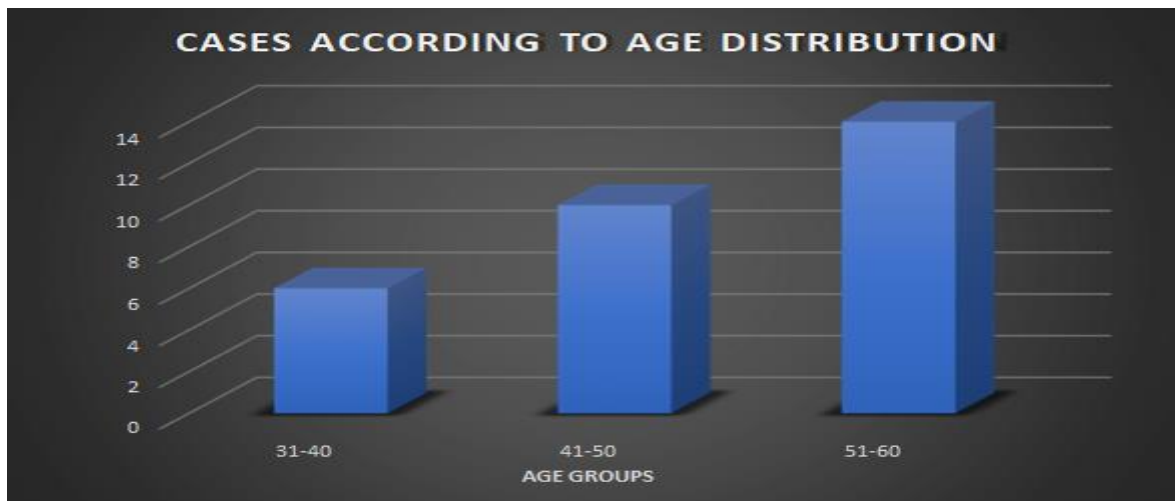
**RESULT**

**OBSERVATIONS AND RESULTS: -**

30 Cases were taken up for the study and statistical data of observations and results are presented in tabular or graphical form.

**TABLE NO: 1 DISTRIBUTION OF CASES ACCORDING TO AGE IN YEARS.**

S.NO	AGE GROUP IN YEARS	TOTAL NO. OF CASES
1	31 -40 YEARS	6
2	41-50 YEARS	10
3	51-60 YEARS	14
		TOTAL =30



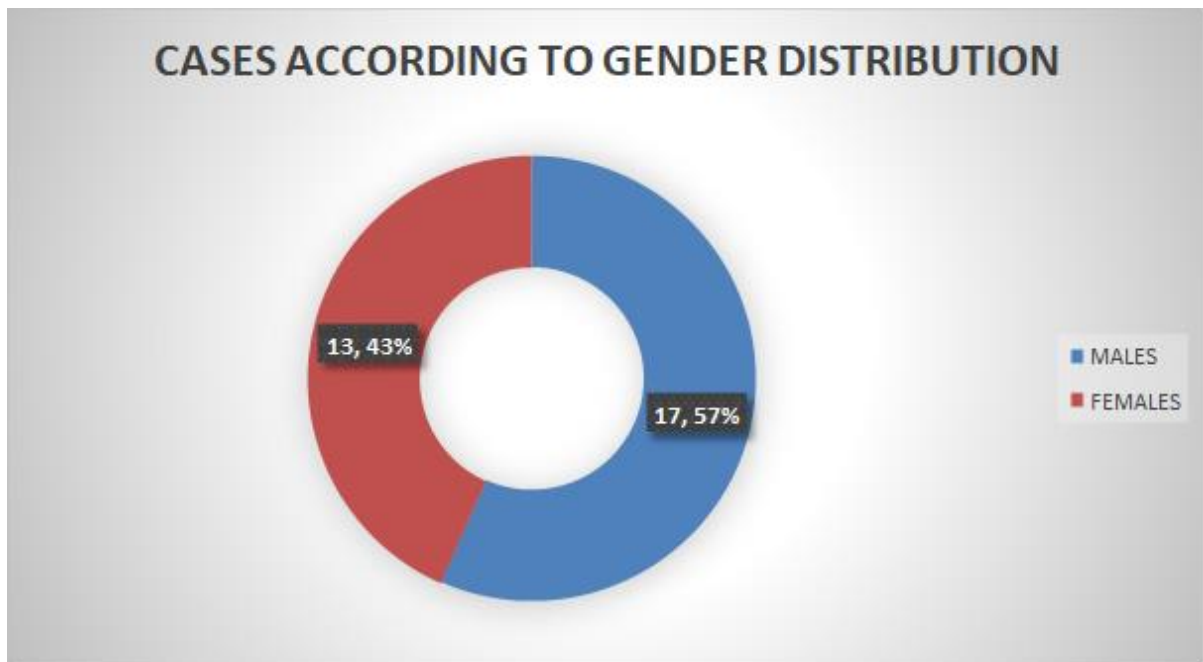


Among 30 cases, 6 cases belong to 31 - 40 years age group, 10 cases belong to 41- 50 years age group and 14 cases belong to 51- 60 years age groups. Most of the cases are recorded in 41 -60 year of age group.

**TABLE NO: 02 DISTRIBUTION OF CASES BASED ON GENDER.**

S.NO	GENDER	TOTAL NO. OF CASES
1	MALES	17
2	FEMALES	13
	TOTAL	30

Among the 30 cases, 17 cases belong to males and 13 cases of females.



**TABLE NO: 03 GLYCEMIC INDICES [HbA1c] BEFORE AND AFTER TREATMENT.**

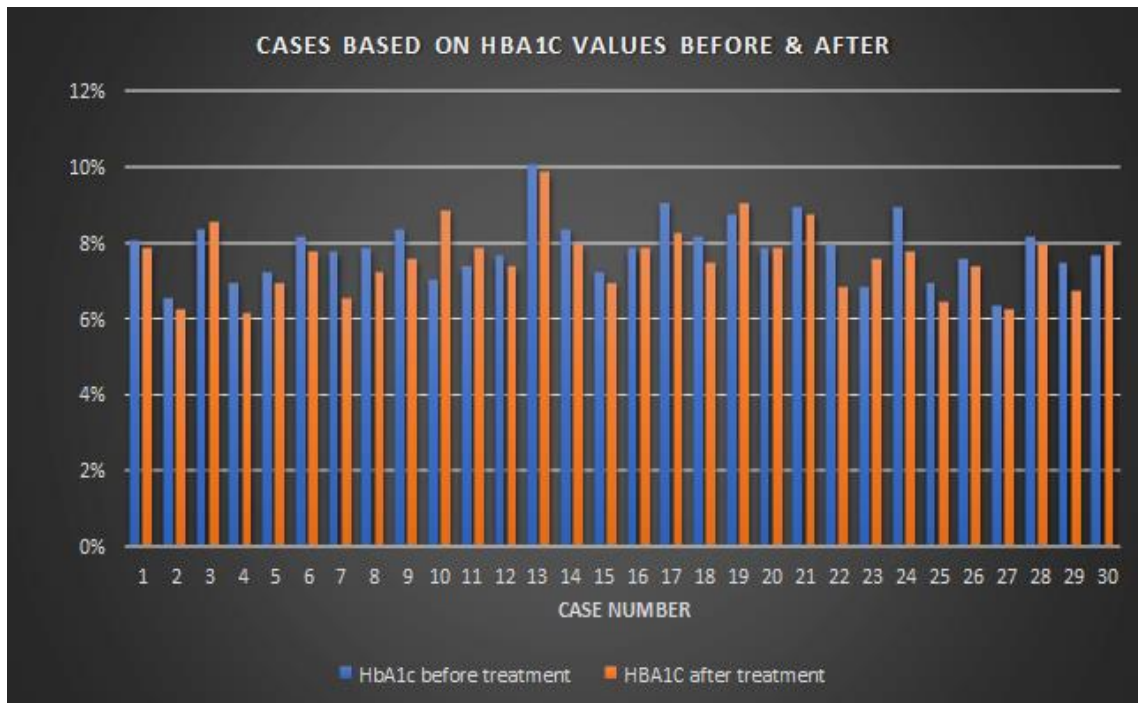
S. NO	HbA1C VALUE BEFORE TREATMENT	HbA1C VALUES AFTER TREATMENT
01	8.0%	7.8%
02	6.5%	6.2%
03	8.3%	8.5%
04	6.9%	6.1%
05	7.2%	6.9%
06	8.1%	7.7%
07	7.7%	6.5%
08	7.8%	7.2%
09	8.3%	7.5%
10	7.0%	8.8%
11	7.3%	7.8%
12	7.6%	7.3%
13	10.0%	9.8%
14	8.3%	7.9%
15	7.2%	6.9%
16	7.8%	7.8%
17	9.0%	8.2%
18	8.1%	7.4%
19	8.7%	9.0%
20	7.8%	7.8%

21	8.9%	8.7%
22	7.9%	6.8%
23	6.8%	7.5%
24	8.5%	7.7%
25	6.9%	6.4%
26	7.5%	7.3%
27	6.3%	6.2%
28	8.1%	7.9%
29	7.4%	6.7%
30	7.6%	7.9%

According to the above data the glycaemic index of the patients ranges from 6.0 to 10.0 %.

Before the start of the treatment maximum values belong from 7.0% to 10.0% and after

the treatment there is marked improvement in 4 cases, moderate improvement in 6 cases and with least improvement in 11 cases. There is no change in 2 cases with increased values in 5 cases.

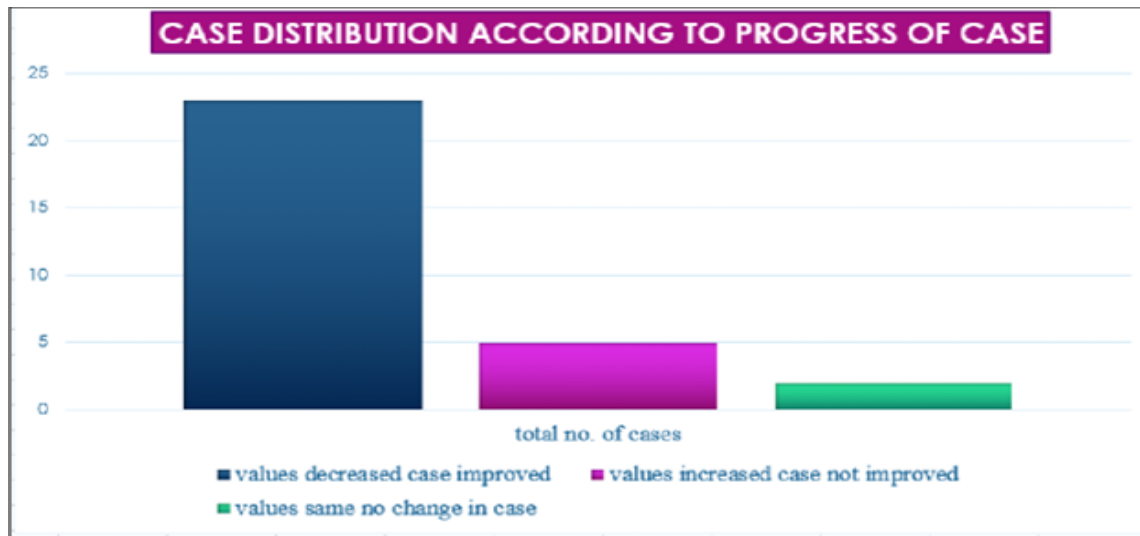


**TABLE NO 4 NO. OF CASES BASED ON IMPROVEMENT IN HbA1c VALUES AFTER TREATMENT**

S.NO	PROGRESS OF CASE ACCORDING TO TEST VALUES	TOTAL NO. OF CASES
1	VALUES DECREASED – CASE IMPROVED	23
2	VALUES INCREASED – CASE DERANGED	5
3	VALUES SAME – NO CHANGE IN CASE	2

Based on the above analysis about 23 cases improved where 4 cases have maximum improvement {difference of 0.8 -1.2} and remaining 19 cases have moderate to

minimum improvement {difference of 0.2 - 0.7} and about 5 cases have shown derangement and 2 cases with no change after the treatment.



## DISCUSSION

The present study of effects of berberis vulgaris on glycaemic control include 30 cases among them 6 cases belong to 31 -40 age group, 10 cases belong to 41-50 age group, 14 cases belong to 51 -60 age group. By this we can say that diabetes is most common among the 4<sup>th</sup> and 5<sup>th</sup> decades of the life.

Among the 30 cases 17 cases belong to males and 13 cases to females indicate both males and females are almost equally affected but there is slight male predominance.

According to the analysis based on the glycaemic index of the patients which range between 6.0% - 10.0 %, before the start of the treatment maximum HbA1c value belonged to 7 % to 10%.

After the administration of berberis vulgaris 6C there is marked improvement in 4 cases with dropping of values from 0.8 to 1.2 and other 6 cases have moderate improvement where the difference value of 0.4 to 0.7 and with least improvement are other 11 cases have difference of 0.2- 0.3. And 5 cases were not improved their value increased than before with no side effects recorded. And remaining 2 cases have no change even with the medication.

Hence according to other studies conducted traditionally shown berberis vulgaris was effective in the treatment of glycaemic indices. So, in my study shows that, Berberis vulgaris 6C was effective in controlling the glycaemic index of the patients.

## CONCLUSION

Berberis vulgaris was effective in controlling the glycaemic index of patients with type 2 diabetes mellitus.

6C potency was effective in treating the cases.

A total of 30 cases were taken based on inclusion and exclusion criteria. All thirty cases were prescribed berberis vulgaris 6C without any individualization. Almost 20 cases showed good response to the administration of the remedy. Patients received treatment for a 3-4 month period and there were no side effects during the study. This study was subjected to statistical analysis and result are made from observation.

### Limitations Of The Study:

Due to the limited sample size and limited duration of the study and the conclusions made through this study are only suggestive and not confirmative. As this was the first study done homeopathically the outcome of this study is not guaranteed. Hence further research has to be done for more effective and accurate results on the outcome of the treatment.

### Declaration by Authors

**Ethical Approval:** Approved

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**Conflict of Interest:** The authors declare no conflict of interest.

## REFERENCES

1. Nawel Meliani, Mohamed El Amine Dib, Hocine Allali, Boufeldja Tabti: HYPOGLYCEMIC EFFECT OF BERBERIS VULGARIS L. IN NORMAL AND STREPTOZOTOCIN INDUCED DIABETIC RATS. [google scholar] Article [cited on 2021 October 11<sup>th</sup>] Available from [https://scholar.google.co.in/scholar?hl=en&as\\_sdt=0%2C5&as\\_vis=1&q=berberis+vulgaris+and+diabetes&oq=BERBERIS+VULGARIS+and+#d=gs\\_qabs&u=%23p%3DRihq9aMwX2kJ](https://scholar.google.co.in/scholar?hl=en&as_sdt=0%2C5&as_vis=1&q=berberis+vulgaris+and+diabetes&oq=BERBERIS+VULGARIS+and+#d=gs_qabs&u=%23p%3DRihq9aMwX2kJ)
2. N.L Tiwari, Prashanth Tamboli: DIABETES MELLITUS- DEFINING SCOPE AND CLINICAL APPROACH FOR HOMOEOPATHIC MANAGEMENT. [google scholar] Article [cited on 1<sup>st</sup> august 2022] Available from <http://aohindia.in/xmlui/handle/123456789/1275>
3. JH. CLARKE, DICTIONARY OF PRACTICAL MATERIA MEDICA VOLUME 2 PAGE NO; -283.
4. DR.C HERING, GUIDING SYMPTOMS OF OUR MATERIA MEDICA VOLUME 2 PAGE NO 440.
5. SIR STANLEY DAVIDSON, DAVIDSON'S PRINCIPLES AND PRACTICE OF MEDICINE, 23<sup>RD</sup> EDITION PAGE NO 726.
6. Ashtoush Ojha, Utkarsh Ojha, Harsh Ohia, Raihan Mohammed, Rudra Trivedi, Sharvari Ugaonakar, Manan Desai, Ramesh Sreevidya, Pratiksha Sahu: ROLE OF AYUSH THERAPIES IN MORDERN MEDICINE: A QUALITATIVE STUDY TO EXPLORE THE AWARENESS AND ATTITUDES OF DOCTORS TOWARDS THE UTILIZATION OF ALTERNATE SYSTEM OF MEDICINE FOR DIABETES MELLITUS. [google scholar] Article [Cited on 1<sup>ST</sup> August 2022] Available from [https://scholar.google.co.in/scholar?start=20&q=homoeopathy+and+diabetes&hl=en&as\\_sdt=0,5&as\\_vis=1#d=gs\\_qabs&u=%23p%3Drq9HMsiQPrQJ](https://scholar.google.co.in/scholar?start=20&q=homoeopathy+and+diabetes&hl=en&as_sdt=0,5&as_vis=1#d=gs_qabs&u=%23p%3Drq9HMsiQPrQJ)
7. WHO, WHO ON TOPIC OF DIABETES MELLITUS. [WHO] [ cited on July 19<sup>th</sup>] Available from, <https://www.who.int/health-topics/diabetes>
8. Kasper, Fauci, Hauser, Longo, Jameson, Loscanzo, HARRISON'S PRINCIPLES OF INTERNAL MEDICINE, VOLUME 2 19<sup>TH</sup> EDITION, PG.NO:-2413.
9. Fatemeh Lazavi, Parvin Mirmiran, Goblon Sohrab, Omid Nikipayam, Pooneh Angoorani, Mehdi Hedayati: THE BARBERY JUICE EFFECTS ON METABOLIC FACTORS AND OXIDATIVE STRESS IN PATIENTS WITH TYPE 2 DIABETES :A RANDOMISED CONTROL TRAIL.[google scholar] Article [cited on 2<sup>nd</sup> august 2022] Available from [https://scholar.google.com/scholarq=related:mFTjwS-\\_qdwJ:scholar.google.com/&hl=en&as\\_sdt=0,5#d=gs\\_qabs&t=1659015227079&u=%23p%3DiKhvYBZ1GuMJ](https://scholar.google.com/scholarq=related:mFTjwS-_qdwJ:scholar.google.com/&hl=en&as_sdt=0,5#d=gs_qabs&t=1659015227079&u=%23p%3DiKhvYBZ1GuMJ)
10. Mojgan Sanjari, Behrang Shamsinejad, Payam Khazaeli, Zohreh Safi, Fatemeh Mirrashidi, Ahmad Naghibzadeh-Tahami: SAFETY AND EFFICACY OF BERBERIS INTEGRIMA ROOT EXTRACTS IN PATIENTS WITH TYPE II DIABETES. A PARALLEL INTERVENTION BASED TRIPLE BLIND CLINICAL TRIAL. [google scholar] Article [cited on 2<sup>nd</sup> august 2022] Available from [https://scholar.google.com/scholar?q=related:mFTjwS-\\_qdwJ:scholar.google.com/&hl=en&as\\_sdt=0,5#d=gs\\_qabs&t=1659015404409&u=%23p%3D9UM1a7HIyKgJ](https://scholar.google.com/scholar?q=related:mFTjwS-_qdwJ:scholar.google.com/&hl=en&as_sdt=0,5#d=gs_qabs&t=1659015404409&u=%23p%3D9UM1a7HIyKgJ)
11. Ladan Tahmasebi, Mehrnoosh Zakerksh , Fereshteh Golfakhrabadi , Foroogh Namjoyan : RANDOMISED CLINICAL TRIAL OF BERBERIS VULGARIS ROOT EXTRACT ON GLYCEMIC AND LIPID PARAMETERS IN TYPE II DIABETES MELLITUS PATIENTS.[google scholar] Article [cited on 2<sup>nd</sup> august 2022] Available from [https://scholar.google.com/scholar?q=related:mFTjwS-\\_qdwJ:scholar.google.com/&hl=en&as\\_sdt=0,5#d=gs\\_qabs&t=1659015563741&u=%23p%3DmFTjwS-\\_qdwJ](https://scholar.google.com/scholar?q=related:mFTjwS-_qdwJ:scholar.google.com/&hl=en&as_sdt=0,5#d=gs_qabs&t=1659015563741&u=%23p%3DmFTjwS-_qdwJ)
12. Rasool Soltani, Syed Mustafa , Ghanadian , Bijan Iraj , Alireza Homayouni , Tanin Shahmiveh Esfahani , Mojtaba Akbari : THE EFFECTS OF BERBERIS INTEGRIMA FRUIT EXTRACT ON GLYCEMIC

- CONTROL PARAMETERS IN PATIENTS WITH TYPE II DIABETES MELLITUS: A RANDOMISED CONTROLLED CLINICAL TRIAL [google scholar] Article [cited on 3<sup>rd</sup> august 2022] Available from [https://scholar.google.com/scholar?q=related:mFTjwS-\\_qdwJ:scholar.google.com/&hl=en&as\\_sdt=0,5#d=gs\\_qabs&t=1659015624469&u=%23p%3D23rEcBX4-2kJ](https://scholar.google.com/scholar?q=related:mFTjwS-_qdwJ:scholar.google.com/&hl=en&as_sdt=0,5#d=gs_qabs&t=1659015624469&u=%23p%3D23rEcBX4-2kJ)
13. Farzad Shidfar , Shima Seyyed Ebrahimi , Sharieh Hosseini , Iraj Heydri , Sharzad Shidfar, Gati Hajhassani: THE EFFECTS OF BERBERIS VULGARIS FRUIT EXTRACT ON SERUM LIPOPROTEINS , apoB , apoA I , HOMOCYSTEINE , GLYCEMIC CONTROL AND TOTAL ANTIOXIDANT CAPACITY IN TYPE II DIABETES PATIENTS [google scholar] Article [cited on 3<sup>rd</sup> august 2022] Available from [https://scholar.google.com/scholar?q=related:mFTjwS-\\_qdwJ:scholar.google.com/&hl=en&as\\_sdt=0,5#d=gs\\_qabs&t=1659015821567&u=%23p%3Dg7TVi2iCPDoJ](https://scholar.google.com/scholar?q=related:mFTjwS-_qdwJ:scholar.google.com/&hl=en&as_sdt=0,5#d=gs_qabs&t=1659015821567&u=%23p%3Dg7TVi2iCPDoJ)
  14. Jamshid Tabeshpour , Moshen Imenshashadi and Hossein Hosseinzadeh : A REVIEW OF THE EFFECTS OF BERBERIS VULGARIS AND ITS MAJOR COMPONENT, BERBERINE, IN METABOLIC SYNDROME [PubMed] Article [cited on 4<sup>th</sup> august 2022] Available from <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5478784/>
  15. Aram Khashayar, Zahra Bahari, Moradipour Elliyeh, Maedeh Ghasemi: THERAPEUTIC EFFECTS OF BERBERINE IN METABOLIC DISEASES AND DIABETES MELLITUS. [google scholar] Article [cited on 4<sup>th</sup> august 2022] Available from [https://scholar.google.com/scholar?as\\_ylo=2021&q=berberis+vulgaris+and+diabetes&hl=en&as\\_sdt=0,5#d=gs\\_qabs&t=1659016135854&u=%23p%3Dd3nVYwzL3SUJ](https://scholar.google.com/scholar?as_ylo=2021&q=berberis+vulgaris+and+diabetes&hl=en&as_sdt=0,5#d=gs_qabs&t=1659016135854&u=%23p%3Dd3nVYwzL3SUJ)
  16. NATIONAL HEALTH PORTAL: DIABETES MELLITUS AND HOMOEOPATHIC APPROACH Article [cited on 4<sup>th</sup> august 2022] Available from [http://www.nhp.gov.in/diabetes-mellitus-and-homeopathic-approach\\_mtl](http://www.nhp.gov.in/diabetes-mellitus-and-homeopathic-approach_mtl)
  17. Homeira Rashidi, Foroogh Namjoyan, Zahra Mehraban, Mehrnoosh Zakersikish, Seyed Bahman Ghaderian, Seyed Mahmoud Latifi: THE EFFECTS OF ACTIVE INGREDIENTS OF BARBERRY ROOT [BERBERINE] ON GLYCEMIC CONTROL AND INSULIN RESISTANCE IN TYPE II DIABETIC PATIENTS. [google scholar] Article [cited on 5<sup>th</sup> august 2022] Available from [https://scholar.google.com/scholar?q=related:mFTjwS-\\_qdwJ:scholar.google.com/&hl=en&as\\_sdt=0,5#d=gs\\_qabs&t=1659332941093&u=%23p%3DpX9VMrTnsAJ](https://scholar.google.com/scholar?q=related:mFTjwS-_qdwJ:scholar.google.com/&hl=en&as_sdt=0,5#d=gs_qabs&t=1659332941093&u=%23p%3DpX9VMrTnsAJ)
  18. Zolikhha Moazezi , Durdi Qujeq: BERBERIS FRUIT EXTRACT AND BIOCHEMICAL PARAMETERS IN PATIENTS WITH TYPE II DIABETES [google scholar] Article [ cited on 5<sup>th</sup> august 2022] Available from [https://scholar.google.com/scholar?q=related:mFTjwS-\\_qdwJ:scholar.google.com/&hl=en&as\\_sdt=0,5#d=gs\\_qabs&t=1659333155389&u=%23p%3D6ihS0VG6uSIJ](https://scholar.google.com/scholar?q=related:mFTjwS-_qdwJ:scholar.google.com/&hl=en&as_sdt=0,5#d=gs_qabs&t=1659333155389&u=%23p%3D6ihS0VG6uSIJ)
  19. Nahid Bijeh , Tohid Mahout Moghadam , Mohamad Shahin : EFFECT OF BERBERIS VULGARIS SUPPLEMENTATION ON GLYCEMIC INDICES PATIENTS WITH DIABETES TYPE 2 AFTER ONE SESSION OF AEROBIC EXERCISE [google scholar] Article [cited on 6<sup>th</sup> august 2022] Available from [https://scholar.google.com/scholar?q=related:mFTjwS-\\_qdwJ:scholar.google.com/&hl=en&as\\_sdt=0,5#d=gs\\_qabs&t=1659333520921&u=%23p%3DilFiXXMrkawJ](https://scholar.google.com/scholar?q=related:mFTjwS-_qdwJ:scholar.google.com/&hl=en&as_sdt=0,5#d=gs_qabs&t=1659333520921&u=%23p%3DilFiXXMrkawJ)
  20. Mohammad Rahimi – Madiseh , Zahra Lorigoini , Hajar Zamani- Gharaghoshi , Mahmoud Rafieian Kopaei : BERBERIS VULGARIS : SPECIFICATIONS AND TRADITIONAL USES [google scholar] Article [ cited on 7<sup>th</sup> august 2022] Available from [https://scholar.google.com/scholar?hl=en&as\\_sdt=0,5&qsp=1&q=glycemic+indices+berberis+vulgaris&qst=br#d=gs\\_qabs&t=1659333772117&u=%23p%3DSrihIW2RSkJ](https://scholar.google.com/scholar?hl=en&as_sdt=0,5&qsp=1&q=glycemic+indices+berberis+vulgaris&qst=br#d=gs_qabs&t=1659333772117&u=%23p%3DSrihIW2RSkJ)
  21. Jayesh Agrawal, Mohammad Hilal, Kishor Ratnaparkhi: A SYSTEMATIC REVIEW ON HOMOEOPATHIC ORGAN REMEDIES IN TREATMENT OF

- DIABETES MELLITUS TYPE II . [google scholar] Article [cited on 7<sup>th</sup> august 2022] Available from [https://scholar.google.com/scholar?hl=en&as\\_sdt=0%2C5&q=diabetes+and+homoeopathic+approach&oq=#d=gs\\_qabs&t=1659333907808&u=%23p%3DPOMBrMu5t-sJ](https://scholar.google.com/scholar?hl=en&as_sdt=0%2C5&q=diabetes+and+homoeopathic+approach&oq=#d=gs_qabs&t=1659333907808&u=%23p%3DPOMBrMu5t-sJ)
22. Zaheja Sujee : A STUDY TO DETERMINE THE EFFICACY OF A COMPLEX HOMOEOPATHIC REMEDY IN THE TREATMENT OF DIABETES MELLITUS TYPE II [google scholar] Article [cited on 8<sup>th</sup> august 2022] Available from [https://scholar.google.com/scholar?hl=en&as\\_sdt=0%2C5&q=diabetes+and+homoeopathic+approach&oq=#d=gs\\_qabs&t=1659333988902&u=%23p%3D1tn0fLdn8HwJ](https://scholar.google.com/scholar?hl=en&as_sdt=0%2C5&q=diabetes+and+homoeopathic+approach&oq=#d=gs_qabs&t=1659333988902&u=%23p%3D1tn0fLdn8HwJ)
23. Aditya Dilipkumar Patil, Charusheela Dilipkumar Patil, Dilipkumar Kondiba Patil: EVALUATION OF ANTI HYPERGLYCEMIC POTENTIAL OF HOMOEOPATHIC MEDICINES INSULINUM , PANCREATINUM AND URANIUM NITRICUM IN STREPTOZOTOCIN INDUCED DIABETIC RATS [google scholar] Article [cited on 9<sup>th</sup> august 2022] Available from [https://scholar.google.com/scholar?hl=en&as\\_sdt=0%2C5&q=diabetes+glycemic+index++and+homoeopathic+approach&btnG=#d=gs\\_qabs&t=1659334181577&u=%23p%3DsCGAfwnBkGsJ](https://scholar.google.com/scholar?hl=en&as_sdt=0%2C5&q=diabetes+glycemic+index++and+homoeopathic+approach&btnG=#d=gs_qabs&t=1659334181577&u=%23p%3DsCGAfwnBkGsJ)
24. Ka Lun Aaron To, Yyuen Ying Yvonne Fok, Ka Chun Marc Chong, Yuen Chi Joanne Lee, Ling Shan Sandy Yiu: INDIVIDUALISED HOMOEOPATHIC TREATMENT IN ADDITION TO CONVENTIONAL TREATMENT IN TYPE 2 DIABETIC PATIENTS IN HONG KONG – A RETROSPECTIVE COHORT STUDY. [google scholar] Article [ciited on 9<sup>th</sup> august 2022] Available from [https://scholar.google.com/scholar?hl=en&as\\_sdt=0%2C5&q=diabetes+glycemic+index++and+homoeopathic+approach&btnG=#d=gs\\_qabs&t=1659334260558&u=%23p%3D4Ultr73Rd9LMJ](https://scholar.google.com/scholar?hl=en&as_sdt=0%2C5&q=diabetes+glycemic+index++and+homoeopathic+approach&btnG=#d=gs_qabs&t=1659334260558&u=%23p%3D4Ultr73Rd9LMJ)
25. Prawej Ansari, Samia Akther and Yasser H.A. Abdel-Wahab: PHARMACOLOGICALLY ACTIVE PHYTOMOLECULES ISOLATED FROM TRADITIONAL ANTIDIABETIC PLANTS AND THEIR THERAPEUTIC ROLE FOR THE MANAGEMENT OF DIABETES MELLITUS. [pubmed] Article [cited on 10<sup>th</sup> august 2022] Available from <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC9268530/>
26. Zara Safari, Amirhosein Farrokhzad, Abed Ghavami, Abdulmnannan Fadel, Amir Hadi, Sahar Rafiee, Amin Mokari-Yamchi, Gholamreza Askari: THE EFFECT OF BARBERRY [BERBERIS VULGARIS L.] ON GLYCEMIC INDICES A SYSTEMATIC REVIEW AND META ANALYSIS OF RANDOMISED CONTROL TRIALS. [science direct] Article [cited on 11<sup>th</sup> august 2022] Available from <https://www.sciencedirect.com/science/article/abs/pii/S0026049508000462>
27. DR.J. D PATIL, GEMS OF TEXT BOOK OF HOMOEOPATHIC MATERIA MEDICA Page no-285
28. HERBERT.A. ROBERTS, THE PRINCIPLES AND ART OF CURE BY HOMOEOPATHY Page no- 247
29. K. PARK, PARK’S TEXTBOOK OF PREVENTIVE AND SOCIAL MEDICINE Page no-528
30. WILLIAM BOERICKE, POCKET MANUAL OF HOMOEOPATHIC MATERIA MEDICA AND REPERTORY Page no-504
31. Jun Yin, Huili Xing, Jianping Ye: EFFICACY OF BERBERINE IN PATIENTS WITH TYPE II DIABETES MELLITUS. [science direct] Article [cited on 11<sup>th</sup> august 2022] Available from <https://www.sciencedirect.com/science/article/abs/pii/S0965229920302>

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