INTRODUCTION

Diabetes mellitus is a syndrome characterized by absolute or relative deficiency of insulin which is commonly seen around the world\textsuperscript{1}. There are more than 50 million Indians suffering from this disease and majority of them belong to type II Diabetes Mellitus as seen in adults. The prevalence of type II Diabetes Mellitus in India is 2.4\% in rural and 11.6\% in urban population. The global incidence of Diabetes type I is increasingly seen in young children\textsuperscript{2} (Figure-1), which is more prevalent in western countries (Table-1). In India its incidence is gradually inclining to about 10.6 cases/year/100,000 population as per statistical records\textsuperscript{3}. In the early childhood diabetes, the constant hyperglycemia causes degenerative changes in the young brain by hampering the normal growth and its modification during their crucial period (Figure-2). This early onset will also cause its impact on the metabolism leading to gradual and subtle derangements, which may not invite attention in early stages. The milestones of the childhood needs great attention for the early recognition of number of ailments, including type I DM. Often they may go unrecognized, but later it may be associated with the disabilities related to learning, memory function, motor activities, reduced Intelligent Quotient(IQ) etc. These changes are due to encephalopathy causing adverse changes where cognitive functions are severely affected.

Worldwide there are 371 million diabetic patients and 187 millions are yet to be diagnosed\textsuperscript{4}. Most of the childhood population of juvenile diabetics is under 14 years of age. Its prevalence is gradually increasing by 3\% every year. Its incidence rate per 100,000 population in this age group vary with less than 4 in Asia, central and South America to over 20 in Scandinavia, Europe, Canada, Australia and Kuwait.
Further, the diabetes during childhood and its adverse effect is increasingly complicated over the past 10-20 years due to the global obesity epidemic in younger age groups, and every year there is an addition of 70,000 incidences seen worldwide\(^5\).

Type I DM is a polymorphic autoimmune disease and its susceptibility is strongly linked with genetic factor known as Major Histocompatibility Complex (MHC) which plays an important role\(^6\). The onset of the childhood diabetes is becoming increasingly predictable through detection of autoantibodies\(^7\). The type I A is immune mediated condition associated with autoimmune antibodies with destruction of islet cells in the endocrine part of pancreas, and type I B is non-immune mediated condition with the destruction of islet cells in the absence of autoimmune antibodies, which ultimately leads to severe insulin deficiency\(^8\).

Tackling the diabetes at the early childhood has becomes a great challenge as post natal brain is still under the process of its final modification. During the 5\(^{th}\) year of childhood the individuals’ brain resemble almost equal to 90\% of the adult brain. The early recognition of brain structural changes in type I diabetes has significant importance in preventing and checking the ongoing adverse effects of Encephalopathy due to hyperglycemia\(^9\). Since ancient times plant and its products are used to combat ailments. A large number of traditional medicines were derived from plants, minerals and organic matters. There are number of herbs mentioned to treat diseases related to central nervous system (CNS) disorders by considering their nootropic, anti-inflammatory, anti-apoptotic and immuno-stimulatory properties. Some of the drugs mentioned as antidiabetic agents include *Acacia Arabica, Aegelemarmelos, Alchemillamollis, Allium Cepa, Vacciniummyrtillus*\(^{L.etc}\)\(^10\).
The global burden of diabetes and other non-communicable diseases are rising drastically. The early childhood diabetes plays an important role in this scenario, where the early drug intervention could be most beneficial in reducing its adverse effects and complications at the earliest. Such epidemic needs a diversified drug formulation to combat the adverse effects of early childhood diabetes on different organs and systems\(^{11}\). The brain is the most sensitive component which responds to any adverse effects lasting for short or longer duration. The constant stress due to these adverse changes in the body can lead to permanent irreversible changes which can cripple the individuals’ life. The recognition of childhood diabetes and initiation of treatment at the earliest can prevent the advanced consequences of encephalopathy by supporting the hassle free learning.

**Figure-1**

*Global incidence of Type I Diabetes Mellitus*
Need of study?

The diabetic therapy is becoming expensive; its increasing incidence throughout the world is becoming a burden on the economy of every country. The conspicuous impact of this can be seen particularly in the living conditions of middle class people. Though the current research in this field is going with much admirable pace, yet it needs an alternate, efficient, easily available and cost effective therapy, for which the current research in the field of natural medicine has taken revolutionary and advanced step. Worldwide the search for antidiabetic herbs and the identification of new antidiabetic phytochemical is under progress. The literature supports the utility of a number of herbal drugs in use to treat diabetes by different medical systems around the world. This stands as a template to carry out the present basic research in order to prove rationality and efficacy of chosen herbs in the experiments. In future this research work shall also advance further to discover drugs for rapidly growing diseases like juvenile diabetes. The Juvenile diabetic changes affect the multiple organ systems including nervous system, which plays an important role to attain an effective personality to survive in this competitive world.

Successful drug discovery is based on utility of the plant and plant products for human benefit. The knowledge of ethno-medicine stands as a rich source, from which hundreds of compounds were obtained, and are used as drugs globally.

The health is not just the “absence of disease” but is a state of physical, mental, social and spiritual well-being. There is a need for an effective alternate therapy to overcome from simple to complex diseases that hamper the quality of our life. There are number of herbs mentioned in Ayurvedic and Chinese medical literature especially to support the cognitive functions. The world today is looking
for a new effective holistic therapy to overcome from the side effects of modern medicine, which may be from simple gastric irritation to bone marrow failure. As some of the side effects are so severe that they resulting into morbid changes. During recent decades the alternate herbal therapies are becoming popular in both developing as well as developed countries. The holistic approach to benefit in maintaining the health in a healthy individual and to support the diseased to overcome from the existing conditions is appreciated. In the present study the herbal therapy in type I DM in young patients will be considered to evaluate effects on early (preventive) and late (curative) interference by using the alcoholic root extract of *Clitoriaternatea* Linn. and *Salaciachinensis* Wight., in young type I diabetic rat model.

The present study gets importance at this point of time to assess the rationality of single and poly herbal treatment in juvenile diabetes mellitus. The use of combination of these drugs (poly herbal therapy) having diversified property of nootropic and antidiabetic activity in the young diabetics could be an important intervention in the early diabetics, as already existing modern treatments have many limitations and side effects.

**Limitations of Western Medicine:**

1. High cost and problems of availability.

2. Side effects causing iatrogenic diseases.

3. Palatability.

4. The raw materials are not environmental friendly and these chemicals are basically toxic in nature.
Limitation of Herbal Medicine:

1. Inadequate scientific evidence.

2. Poor documentation practices.

3. Use and effects are based on observations alone and many not be scientifically endorsed.

4. The knowledge of herbs may be held as secret by experts.

5. Lack of familiarity with language used in classical texts.

6. Herbs often cause confusion and controversy in their identification.

7. Need for thorough processing, which is viable only when they are used in large quantity.

Advantages of plant based therapy:

1. It has a long history of practice and acceptance.

2. The idea of using herbal drug or therapy passes from generation to generation.

3. Abundant resources.

4. Cheap and affordable.

5. Having multiple choices and wide range of substitutes.

6. Single drug showing multiple action targets.