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Research Article

Adding GABA to Insulin Leads to New era in Type 1 Diabetes Management

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Abstract

Introduction: Some risks factors associated with COVID-19 infections were established such as coronary artery disease in patients with SARS-CoV-2 infections. The use of highly concentrated medications according to Arndt Schultz Law can induce reduction in the vital energy, leading to stagnation of Blood and propensity to have myocardial infarction even without arterial obstruction.

Purpose: to demonstrate that patient with COVID-19 infection that received highly concentrated medications to treat this infection, have more propensity to develop myocardial infarction some days after the treatment instituted.

Methods: through one case report of 42 years-old-male patient with history of acquired COVID-19 on January 2nd 2021. He was admitted in the hospital due to dyspnea symptoms, myalgia, and needs oxygenation. He received the medications, Ivermectin, Hydroxychloroquine, corticosteroids. After 18 days of the initial manifestations, the patient felt pain in the chest and went to the hospital and they found that his troponin was increasing gradually and after two hours of it increased many times and the physician decided to admit him again in the hospital to make more exams. The patient was submitted to catheterization and the result of this procedure were that all his coronary were in perfect state of health without any obstruction and they treated him as he had myocardial infarction. After three months, the patient went to my clinic due to post herpetic neuralgia and also to evaluate his condition and I performed the chakras' energy centers measurement.

Results: the results of this chakras' energy centers measurement revealed that all his chakras were in the lowest level of energy (rated in one) with exception of the seventh (that was normal, rated in eight). I began his treatment using homeopathies medications according to the theory *Constitutional Homeopathy of the Five Elements based on Traditional Chinese Medicine.*

Conclusion; the conclusion of this study is that patients treated with highly concentrated medications to treat SARS-CoV-2 infection can develop myocardial infarction even without arterial obstruction due to energy deficiency state prior to this infection and aggravated many times with to the use of any type of highly concentrated medications to treat this kind of infection, because it will reduce the vital energy that was already very low before the infection and will cause stagnation of Blood in any part of the body, in this case, inside the coronary artery.

Keywords: myocardial infarction; medications; energy; chakras; traditional chinese medicine; homeopathy; hippocrates

Introduction

Diabetes mellitus is not just a disease, it dramatically affects people's lives, both physically and psychologically. It is like a permanent guest, never leaving its owner [1].

Diabetes mellitus is considered as a group of metabolic disorders that result from a problem in the secretion of insulin hormone or a problem with how the body's cells receive this hormone, or both reasons together [2]. It is worth noting that diabetes mellitus is one of the most prevalent diseases these days [3]. It must be noted that the patient's number increased from about 100 million patients in 19801 to about 400 million patients in 2014 [4].

Diabetes mellitus is considered now to be from the most common causes of death worldwide,and also become the most important cause of kidney diseases, heart diseases and stroke [5].

About 92% of diabetic patients suffer from type 2 diabetes [6], but about 5% of people suffer from type 1 diabetes, which is the most prevalent

chronic disease in children. About 90% of diabetes in children is of type 1 [7]. It is also the most dangerous and aggressive type among the other diabetes types [8]. Type 1 diabetes often results from a defect in the immune system, in which antibodies are directed against the beta cells in the pancreas, which leads to its complete destruction, making the patient completely dependent on insulin for life [9]. Type 1 diabetes occurs in people who have a genetic predisposition, with exposure to environmental factors. Despite insulin usage 4 times a day, it does not completely control the level of glucose in the blood [10], with frequent episodes of hypoglycemia, and a severe rise in blood glucose levels [11], which leads to diabetic ketoacidosis and frequent admission to intensive care unit [12]. It causes severe psychological and physical disturbance [13]. Type 1 diabetes is diagnosed by the appearance of antibodies directed against pancreatic beta cells such as islet cell autoantibodies, and autoantibodies to insulin (IAA), (GAD), protein tyrosine phosphatase (IA2 and IA2β), and zinc transporter protein (ZnT8A) [14].

It has long been known that gamma-Aminobutyric acid (GABA) is the most prevalent inhibitory neurotransmitter in the nervous system [15].

GABA acts via GABAA and GABAB [16]. It was recently discovered that GABA is existing outside the nervous system [17]. GABA was discovered to be present in pancreatic beta cells and is secreted with insulin in a regular pattern [18]. It has a known role of inhibiting Glucagon secretion from alpha cells [19].

GABA is primarily made from glutamate by the enzyme glutamate decarboxylase (GAD) [20]. It is well known that oral GABA cannot cross the brain barrier, and so external GABA should not be used for central relaxing effect [21]. It is promising to know that, it was detected that GABA can stimulate and multiply beta cells in islets of langerhans through activation of PI3K/Akt pathway and can also convert alpha cells to beta cells with long term use [22], Which opens the door to new ways to treat diabetes [23]. Also, it was discovered that GABA has an effect on the immune system, as it inhibits inflammatory immune response by its effect on GABA A receptors preventing release of many inflammatory cytokines [24]. while GABA B receptors have no effect on the immune system [25]. The most predominant antibody in a patient with type 1 diabetes is against GAD65, an enzyme which catalyzes conversion of glutamate to GABA [26]. GAD65 antibodies occur in about 70% of patients complaining of type 1 diabetes [27]. GAD destruction by the immune system induces beta cell apoptosis and death [28]. it is important to notice that GABA A agonist could inhibit glucagon secretion and decrease hepatic gluconeogenesis which has good effect on glucose homeostasis [29]

Materials and Methods:

100 patients of type 1 diabetes followed in a private clinic for 1 year. they are on multiple insulin injections in the form of lantus and actrapid. this is an observational cohort study. The patient ages were between 14 and 28 years old 60 patients are males and 40 patients females. At first 6 months they were on insulin only .On the second 6 months they received GABA as medical nutrition.

We measured hba1c after the first and second 6 months, also we calculated insulin dose for each patient after the first and second periods as a primary outcome.

We measured how many patients developed dka and hypoglycemia after the first and second periods as a secondary outcome.

Results:

For analysis of data we used graphpad prism software.

	Unpaired t test Tabular results	
1	Table Analyzed	Data 1
2		
3	Column B	after gaba (a1c)
4	vs.	vs.
5	Column A	before gaba (a1c)
6		
7	**Unpaired t test**	
8	P value	0.0051
9	P value summary	**
10	Significantly different (P < 0.05)?	Yes
11	One- or two-tailed P value?	Two-tailed
12	t, df	t=2.833, df=198
13		
14	**How big is the difference?**	
15	Mean of column A	9.324
16	Mean of column B	8.756
17	Difference between means (B - A) ± SEM	-0.5680 ± 0.2005
18	95% confidence interval	-0.9634 to -0.1726
19	R squared (eta squared)	0.03895
20		
21	**F test to compare variances**	
22	F, DFn, Dfd	1.014, 99, 99
23	P value	0.9466
24	P value summary	ns
25	Significantly different (P < 0.05)?	No
26		
27	**Data analyzed**	
28	Sample size, column A	100
29	Sample size, column B	100

Table 1: Showing significant difference in hba1c before and after GABA

The results show a statistically significant difference in hba1c in patients before and after 6 months of treatment with GABA With p value less than 0.0051.

as shown in table 1 and figure 1.

The results show statistically significant decrease in insulin dose in patients after GABA use with p value less than 0.0001 as shown in table 2 and figure 2.

The results show a significant decrease in dka incidence in patients after 6 months of GABA,as shown in table 3 and figure 3.

The results show significant decrease in hypoglycemic episodes in patients after 6 months treatment of GABA with p value less than 0.0001 as shown in table 4 and figure 4.

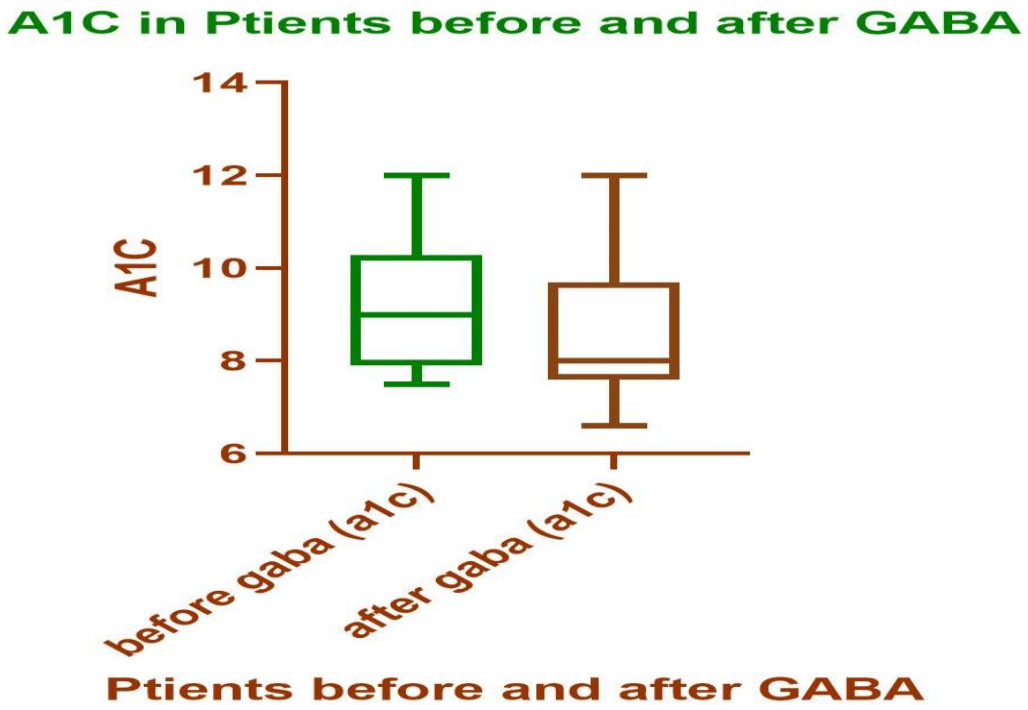

Figure1: Showing significant difference in hba1c before and after GABA

Table Analyzed	Data 1
Column B	after gaba (insulin dose)
vs.	vs.
Column A	before gaba (insulin dose)
Unpaired t test	
P value	<0.0001
P value summary	****
Significantly different (P < 0.05)?	Yes
One- or two-tailed P value?	Two-tailed
t, df	t=8.996, df=198
How big is the difference?	
Mean of column A	70.32
Mean of column B	54.18
Difference between means (B - A) ± SEM	-16.14 ± 1.794
95% confidence interval	-19.68 to -12.60
R squared (eta squared)	0.2901
F test to compare variances	
F, DFn, Dfd	1.105, 99, 99
P value	0.6218
P value summary	ns
Significantly different (P < 0.05)?	No
Data analyzed	
Sample size, column A	100
Sample size, column B	100

Table 2: showing significant decrease in insulin dose after gaba

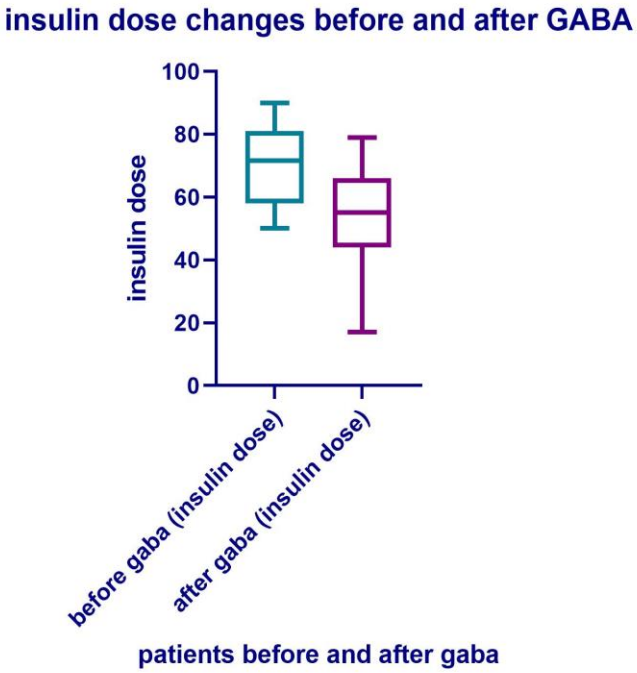

Figure 2: showing significant decrease in insulin dose after gaba

Unpaired t test Tabular results	
Table Analyzed	Data 1
Column B	after gaba (dka)
vs.	vs.
Column A	before gaba (dka)
Unpaired t test	
P value	<0.0001
P value summary	****
Significantly different (P < 0.05)?	Yes
One- or two-tailed P value?	Two-tailed
t, df	t=4.902, df=198
How big is the difference?	
Mean of column A	0.3000
Mean of column B	0.05000
Difference between means (B - A) ± SEM	-0.2500 ± 0.05100
95% confidence interval	-0.3506 to -0.1494
R squared (eta squared)	0.1082
F test to compare variances	
F, DFn, Dfd	4.421, 99, 99
P value	<0.0001
P value summary	****
Significantly different (P < 0.05)?	Yes
Data analyzed	
Sample size, column A	100
Sample size, column B	100

Table 3: showing decrease of dka incidence after gaba

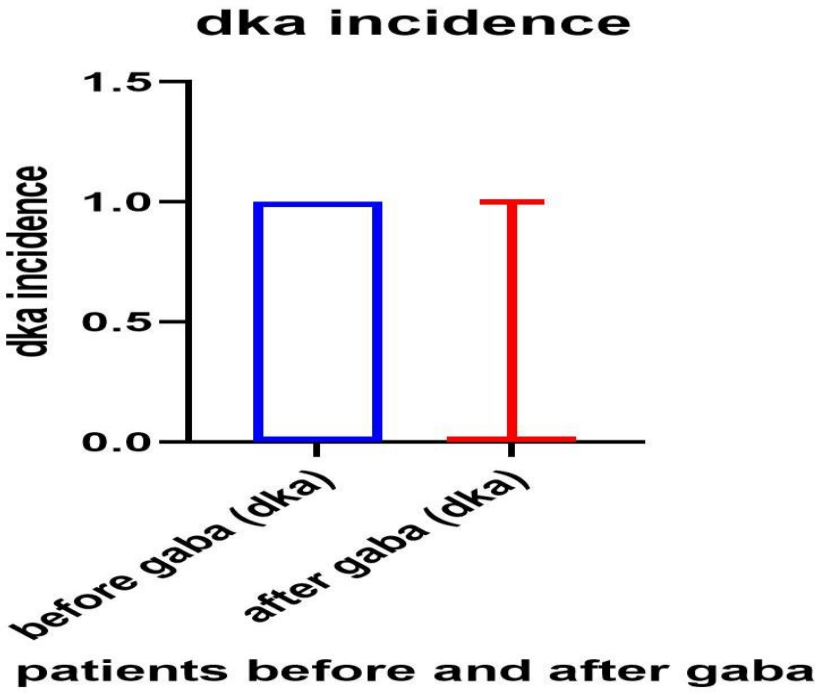

Figure 3: showing decreased incidence of dka after gaba

Unpaired t test Tabular results	
Table Analyzed	Data 1
Column B	after gaba (hypoglycemia)
vs.	vs.
Column A	before gaba (hypoglycemia)
Unpaired t test	
P value	<0.0001
P value summary	****
Significantly different (P < 0.05)?	Yes
One- or two-tailed P value?	Two-tailed
t, df	t=4.902, df=198
How big is the difference?	
Mean of column A	0.3000
Mean of column B	0.05000
Difference between means (B - A) ± SEM	-0.2500 ± 0.05100
95% confidence interval	-0.3506 to -0.1494
R squared (eta squared)	0.1082
F test to compare variances	
F, DFn, Dfd	4.421, 99, 99
P value	<0.0001
P value summary	****
Significantly different (P < 0.05)?	Yes
Data analyzed	
Sample size, column A	100
Sample size, column B	100

Table 4: showing significant decrease of hypoglycemic episodes after gab

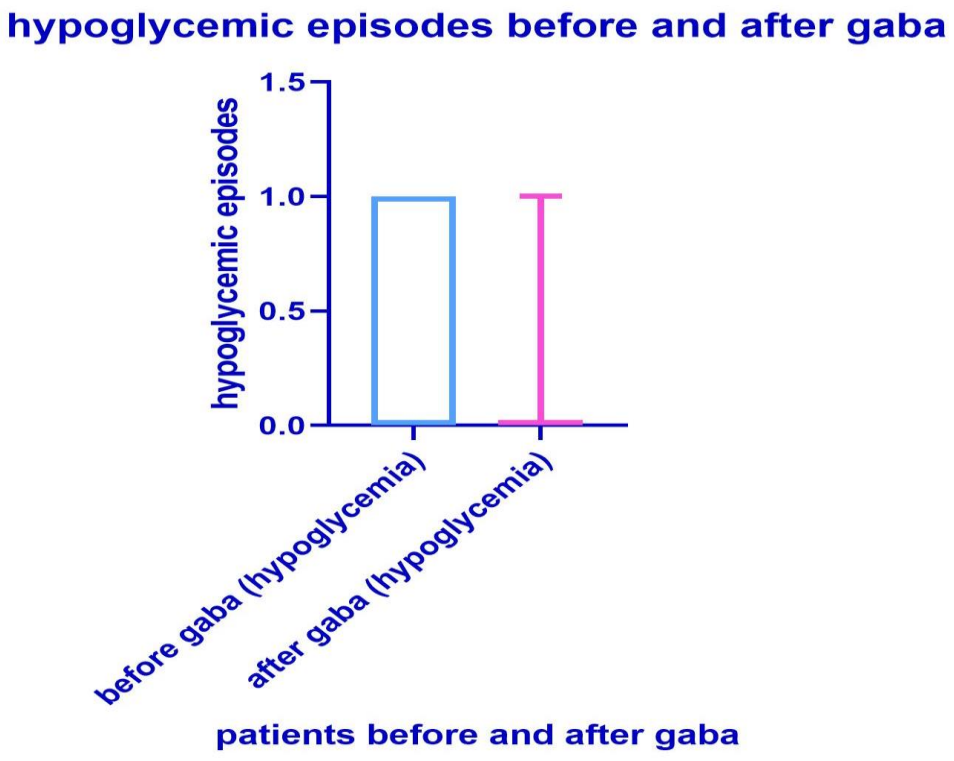

Figure 4: showing significant decrease in hypoglycemic episodes after gaba

Discussion:

Type 1 diabetes is considered as a severe form of diabetes mellitus, which is the most prevalent form of diabetes mellitus occurring in children and adolescents. about 20 % of cases occur in adults [30].

Dependence of type 1 diabetes on multiple daily insulin injections, and the difficulty to reach therapeutic goals, putting great impact on patients and making their life difficult. Also as most patients suffering from type 1 diabetes are children making the problem more complicated as treatment goals are against their risky nature of thinking [31].

There must be a new way of thinking in managing type 1 diabetes [32]. to prevent complications from hypoglycemia to diabetic ketoacidosis, to to give type 1 diabetes patients the chance to live in a normal way like other peoples [33]. GABA is present in pancreatic beta cells and has a rule in stimulating insulin secretion and inhibiting glucagon secretion [34]. GABA also has beta cell regeneration ability by preventing beta cell apoptosis and conversion of pancreatic alpha cells to beta cells. In a study published in 2018, it was confirmed that GABA inhibited about 16 cytokines from about 26 cytokines in the plasma of type 1 diabetes patients [35].

There are 2 limitations of this study; the first is the small number of patients but we can explore the results to the general population, the The second limitation is whether the results are transient or persistent. The results of our study show that adding GABA to insulin in treatment protocol of type 1 diabetes patients could enhance quality of life and decrease type 1 diabetes complications, could decrease dka incidence, and decrease insulin dose. Further large-scale studies and clinical trials are needed to confirm our result.

Conflict of interest:

Author declared that there is no conflict of Interest.

Conclusion:

Type 1 diabetes is the most virulent type of diabetes mellitus. putting great burden on patients especially in young age patients which constitute the majority of patients. GABA is considered as the best choice for adding to insulin for patients with type 1 diabetes decreasing insulin dose, decreasing incidence of diabetes complications.

Data Availability:

Data in supplementary information files

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