

Integrative Approaches and Proposed Protocols for Non-Insulin Resistant Diabetes

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Abstract

Thus, NIDDM needs a special strategy because it is a complex phenomenon. The aim will, therefore, be to conduct a critical appraisal of relevant literature in order to develop a fully appreciable viewpoint of NIDDM and later suggest an integrative strategy that will address its different components. This proposal is aimed at combining old-fashioned medical treatments with nutraceuticals and lifestyle change. The combination of modalities aims at ensuring that besides glycemic-related targets NIDDM is addressed. One very enlightening case study that highlights the importance of this integrative approach is mentioned in this regard. It is about an elderly woman aged sixty years who was found to be suffering from genetic hypertension as well as behavioural hypertensive causes. In addition to the diabetes family history, the case study describes the events that happened along the patient's care pathway for a month or more. The findings indicated significant improvements in glycosylated hemoglobin, blood pressure, and lipid profiles. This also demonstrated significant decreases in the number of complication cases and better patient status. Such an approach has shown that it can simplify NIDDM and constitutes a shift towards more useful and tailor-made diabetes mellitus type 2 management approaches. This provides more credence to the ongoing discussions on utilizing interconnected means in the new form of type two diabetes management, which demands a versatile and individualized therapeutic regimen. The rapidly rising global burden of NIDDM provides an excellent foundation for additional exploratory research on this combined intervention pathway with a view toward the formulation of a patient-focused diabetes management protocol.

1. Introduction

One of the most notorious metabolic diseases that are considered a major public health issue nowadays is non-insulin dependent diabetes mellitus (NIDDM) or diabetes type 2, and its prevalence rises in direct proportion to the growth of obesity and sedentary lifestyle. In NIDDM, which presents chronic hyperglycemia refractory at the level of the biological effect of insulin, one observes the complex relationships between genes and styles. This paper seeks to examine intricate problems about treating NIDDM by conventional means as well as alternative approaches, culminating in a method that integrates the results of previous studies within the last decades. The reason Metformin forms a basis of treatment for NIDDM at present is because it turns out that this drug is a potent enhancer of sensitivity to insulin. However, with time-evolving practice, it has become apparent that there is a need to adopt a holistic perspective as opposed to merely therapeutic approaches. This paper moves beyond orthodox diabetes management and brings together evidence-based practice and complementarily for patient specific care. The study aims to shed light on the complex aetiology of NIDDM and proposes a complementary strategy beyond glucose management. An example of practice will be provided with a persuasive case showing how an integrative strategy can either work or fail in everyday situations. A 60-year-old black woman of diabetic parentage with concomitant hypertension and lifestyle risks. For that matter, the paper gives practical

tips related to the holistic management of NIDDM, which would be based on the outcome of the proposed integrative protocol for a patient in the journey. Such an integrated treatment consists of taking traditional medicines alongside nutraceutical supplementation and modification of lifestyle, among other vibrant components in the area of scientific research and patient-centred care. The paper will contribute to the ongoing talk in regard to NIDDM management as well as developing a holistic approach informed on complexity to give proper solutions for better health outcomes using multimodal care to cover different interventions.

1.1. Literature Review

Pathophysiology of NIDDM: This type of defect is multifocal and involves both deficiencies of insulin secretion and peripheral insulin resistance [1]. Pancreatic beta cells are unable to effectively secrete insulin needed to reduce blood sugar in those suffering from NIDDM. Additionally, muscles and other peripheral tissue fail to respond appropriately to insulin hence limiting entry of glucose in the bloodstream. However, NIDDM is characterized by dual impairment, with persistently high glucose levels as its primary feature, commonly referred to as hyperglycemia. Such defects are highly complicated matters. A proper holistic approach to treating the condition, therefore, necessitates examination of insulin production potential and sensitivity. Moreover, NIDDM has been classified by the World Health Organization

(WHO) into two main subgroups: obese and non-obese [2]. Recognition is a major factor in the NIDDM development pathway, as evidenced by the importance of adiposity. Adipose tissue in obesity increases the probability of insulin resistance and thus enables diabetes formation. Nevertheless, the non-obese group argues that it is not only fatness but also genetic predisposition and lifestyle that contribute to NIDDM pathogenicity. This has enabled us to acknowledge the diversity that exists within the NIDDM people and customize various therapeutic means to individuals based on their profile. NIDDM has several risk factors, which only add to the interrelationship complexities of the web of determinant factors that lead to the disease. One of the major causes of non-insulin-dependent diabetes mellitus, especially among obese people, is excessive weight gain. Type 2 diabetes, among many poor eating habits and physical inactivity, is the major aggravator. Moreover, one realizes that familial history is relevant and points out a genetic contribution to such cases. The studies show that people with family backgrounds of diabetes susceptible to NIDDM should be screened, hence the preventive intervention of these population groups [3]. The NIDDM, however, is more complicated since it involves different malfunctions whose relationship still needs to be understood so as to come up with an effective preventive measure and treatment strategy for the disease.

1.2. Conventional Treatments

The treatment of NIDDM should deal with every determinant in a particular diabetic process. Management of type 2 diabetes involves decreasing glucose levels in the blood and enhancing insulin function in therapy for NIDDM. One of such armaments against non-insulin dependency DM (NIDDM) patient is metformin therapy that commences their treatment. It lowers hepatic glucose production and improves insulin-tissue interaction to enhance blood glucose homeostasis [4]. On the other hand, Metformin affects people differently, meaning a person's experience could be stomach pain and should take treatment as prescribed. Consequently, it is acknowledged that monotherapy does not provide sufficient glucose control, hence the use of Metformin in combination with other agents. Managing NIDDM is complex and should rely on an ongoing, patient-specific adaptation. The treatment for NIDDM might be through gliclazide, a sulfonylurea, and Xulatophy, which combines insulin degludec and liraglutide. This is a process of varying medication in relation to the patient, their receptivity, surroundings, and diseases they develop. This requires regular monitoring, especially for some types of drugs, since they may result in hypoglycemia or other more negative conditions. Moreover, these drugs are produced on demand, especially for each patient, and this points to the necessity of individual medical therapy [5]. Modern trends in diabetes care have shifted towards a more comprehensive perspective that examines the impact of diabetes on every sphere of an individual's health as opposed to just concentrating on maintaining optimal glucose levels. Therefore, for the management of NIDDM in an effective manner, integrative approaches integrating evidence-based practice and complementary and conventional therapies have been proposed [6]. Such an integrative approach could

be useful in helping the management of NIDDM, which is a multifactorial disorder. These are integrative approaches for common type 2 diabetes management, which include lifestyle changes, nutrient supplements (nutraceuticals), and patient education. The body's own ability, holistic health cure, evidence-based and personalized, giving people power over their own bodies.

This is called the integrative paradigm, which means that the patients should be treated individually and not according to the programs designed for NIDDM. Diabetes being multifactorial in nature suggests that patient patient-centred approach appreciates this complexity. These introspective approaches deliver a holistic approach to caring that involves patient involvement in their health management process. Some of these include diet change, appropriate exercises, and stress reduction, which have proven useful while dealing with integrated diabetes management. However, these lifestyle interventions go way past just diabetes management into improving overall health and wellness. In addition, the use of nutraceuticals as part of an integrative approach comprises a number of bioactive compounds, such as those found in food products or supplements [7]. Other compounds like curcumin and carotenoids enhance tolerance levels for glucose and its management in patients with diabetes and its complications, making these compounds secondary mode interventions. Patient education is fundamental in the integrative paradigm and makes it possible for people to actively participate in their own recovery. Patients come to the realization of the implications of lifestyle and drug use and the benefits accompanying complementary interventions with which they can actively participate in monitoring their health management [8]. The cooperative approach fosters adherence to treatment in order to promote long-term health benefits. In conclusion, it is time to shift the practice approach and move away from evidence-based practices in tackling the complicated issues associated with type II diabetes management. This approach is dynamic, patient-centered, and integrated medicine and includes lifestyle modification, nutraceuticals (food drugs), and education. The switch acknowledges the complexity of treatment and expects active participation of a patient. This becomes an initiation point for effective management of diabetes in total.

1.3. Nutraceuticals in Diabetes Management

The management of diabetic patients and those with prediabetes now has nutraceuticals as an important consideration, supplementing what is already being done. Some of the pathways of glucose regulations might be affected by the nutraceuticals that comprise bioactive elements naturally extracted from food or sold alone as a dietary supplement. Much research has shown that some nutraceuticals are effective against certain features related to diabetes. One of the important nutraceuticals to be extracted from spices such as turmeric is curcumin, which exhibits an anti-inflammatory effect and reduces oxidative stress [9]. Studies have shown that curcumin works against impaired glucose tolerance that gives rise to type-2 diabetes by raising insulin sensitization, lowering oxidative stress, and guarding against inflammations [10]. Considering that

curcumin can affect important factors influencing glucose control homeostasis, this agent becomes another alternative in supplementary treatment against diabetes at the initial and beginning stages. Another study has also investigated the effect of carotenoids (pigment) in fruits and vegetables on retinal functions in the aforementioned people group [11]. The fact that lutein and zeaxanthin are oxidants, makes them potential prevention agents owing to highly vulnerable retina. Studies show that these carotenoids are beneficial in reducing risks such as diabetic retinopathy in persons with diabetes and may contribute to healthy eyes. It should also be done cautiously on a case-by-case basis with the right dosage and the chance of having interaction with the other prescribed drugs [12]. Also, recognizing the synergies of the nutraceutical approach with wider modification techniques such as dietary modifications or physical activity, will allow for maximization of healing effects. As time goes on, researchers are learning more about modes of function and better guidelines for nutraceutical consumption in diabetes science. Exploring nutraceuticals becomes a fascinating route toward personalized and holistic ways of diabetes management supported by alternate prevention methods as well as additional therapies. While issues such as standardization of dose and long-term safety profile should be addressed in ongoing research, recent studies point out how nutraceuticals might revolutionize type 2 diabetes management toward whole-person oriented, patient-centered care by providing more than just pill therapy.

1.4. Case Study

Patient Profile: A sixty-year-old woman with several comorbidities, the patient. The fact that her family also has NIDD makes her situation understandable as part of her self-story. Besides, she has hyperthreoinemia, which just makes everything worse, indicating that metabolic disorders coexist with one another. Obesity is also among the key factors that lead to or aggravate diabetes, with the patient also carrying its burden. It is well documented that overweight is a risk factor for type 2 diabetes, and hence obesity is closely related to insulin resistance. Furthermore, the fact that the patient is also a smoker further complicates her illness. One of the risk factors that can be modified is smokers, which can even aggravate existing metabolic abnormalities. Also, it adds up to the total burden associated with cardiovascular conditions. The most conspicuous first, and maybe first, index of the disease she had was her blood sugar (17.2 mmol/l), which far exceeded normal values. Elevated blood glucose can signify urgent needs where an uncontrolled case of diabetes has already been present at that moment. Collectively, these risk factors provide a more complete view of a patient's lifestyle, environment, and genetic makeup in their interrelationships. Therefore, there is a need to consider taking a holistic view in relation to tackling Kali's health problems, which should entail looking at dietary change as well as prescription drugs incorporating appropriate nutraceutical products that suit her needs. This patient's story demonstrates that it can be incredibly difficult if a person is trying to cope with diabetes and its co-morbidities. Thus, they could respond to only targeted methods when applied independently.

1.5. Initial Treatment

The first-line drug therapy for NIDDM is usually Metformin. At admission, the patient started on Metformin at 500 g/day along with diabetes dietary advice and exercise. Metformin mainly lowers liver glucose output, which results from enhanced glucose uptake and utilization by the periphery via sensitization. It is the most established role among drugs used for treating NIDDM with it being typically used as the first-line pharmacotherapeutic. Supplementing the effect of the drug, the treatment program includes dietary and exercise recommendations targeting lifestyle changes. Regulation of carbohydrate intake, among other dietary changes towards balancing blood sugars. Conversely, regular physical activity results in improved insulin sensibility as well. It is also worth noting that keeping the right mass significantly affects this disease. In addition, poorer outcome occurs with the first treatment in the one-month follow up. The patient still experiences increased blood sugars; the constant fatigue is as good as evidence of inadequate glycemic control. This term highlights patient insecurity with respect to drug use, alongside the requirement to continually reevaluate any management strategies in diabetes care across a shifting landscape. However, Metformin is generally tolerable but may also cause side effects, thus failing to provide equal benefit for all people. As a result, there is a reevaluation of the treatment process because it does not give a satisfactory reaction. NIDDM care is a personal activity, meaning that it cannot afford any variation in responses between individuals, hence a personalised and flexible approach. Despite the sustained high blood sugar, as well as fatigue, there is a requirement for a stronger and more targeted intervention program. Considering these challenges, changes in the treatment regimen are vital for the optimization of glycemic control and symptomatic relief.

Secondly, Follo came up with a higher dose of medicine targeted to rectify the defects arising after a month-long review. The dosage of Metformin should be increased to 500 mg twice per day and instructed on dietary modifications. The other drug prescribed is Glycazine (sulfonyleurea) and Xulatophy – a mixture of both insulin glade and liraglutide. Metformin acts on the liver; therefore, it indirectly initiates the secretion of insulin from beta cells of the pancreas for completion by gliclazide. Conversely, xulatophy (or compounded) gives another dimension to glycemic maintenance because it combines two products—a long-acting GLP-1 receptor antagonist and an analog of insulin [13]. This is because of the complex nature of NIDDM. It is possible that combination therapy may yield better results than monotherapy on some occasions. He develops complicated problems, as evidenced by increased irregular glucose spikes and unremitting exhaustion as a result of NIDDM. They are crucial as they show that the attainment of glycemic control only and without attending to other aspects of the disease is not adequate to address the overall impact of diabetes on the patient's health status. Z several drugs are incorporated, thereby taking a more intensive course of action in the modified regimen. However, this modified regimen is going to be monitored closely as these things are essential in managing this complex metabolic

disease. Months one and two posttreatment assessments show improved promise when adjusted to the treatment plan. Blood sugar falls continuously while normal levels are restored. Moreover, these, as well as other markers such as carbamide and creatinine – signs of a healthy kidney, also improve [14]. Additionally, there comes down with the HbA1C percentage that is a significant index of longterm serum glucose levels and this approaches its treatment range. Among them, it is remarkable that the patient says that fatigue has cleared, and she lost about eight kilograms in the next three months after doing so. Successful adjustment of treatment means that difficulties and problems connected to the primary treatment were overcome successfully.

The synergistic action of the mixed drugs consisting of Metformin, Gliclazine, and Xulatophy resulted in the newly developed therapy being successful. There are many of them, such as different substances that strike individual elements of the multifactorial origin of NIDDM, leading to better glycemic control when applied together rather than separately. These two drugs, Metformin, in combination with gliclazide, produce insulin while at the same time, xulatophy, an agent useful for supporting insulin and active glucagon-like peptide-1, has some notable benefits that can be shown through measuring the Finally, it must be remembered that every good therapy depends on the advances concerning certain kinds of diabetes, their nature and variability, as well as each patient's reaction to various methods of treatment. Typically, standard treatment of NIDDM begins with Metformin and lifestyle modifications. However, a one-month follow up indicates just how challenging getting optimum glucose level control and symptomatic treatment could be. However, subsequent alterations to the treatment, such as increased drug intake with the inclusion of Gliclazide and Xulatophy, emphasize the need for a flexible approach in a bid to manage NIDDM. The fact that in three months, these improvements are observed shows that combinational therapies might have a role in managing multiple factors involved in NIDDM as part of NIDDM therapy.

1.6. Integrative Protocol

A personalized treatment (also known as IPCN) that is combined with pharmacotherapy in the management of NIDDM as a longstanding illness. Proprietary blends I-VI, each containing selected nutraceuticals with a purposed effect on glycemia and health. The involvement of nutraceuticals, which are derived from food or used like dietary supplements, addresses this important gap in DM therapy and presents a holistic approach to controlling NIDDM. They have blood sugar levels that are between normal and the prediabetic stage, also known as impaired fasting glucose. This represents a new paradigm that incorporates empirical treatments as well as complementary and traditional methods of treatment. Among nutraceuticals, only one has the advantage of being a non-blood glucose control intervention. Such proprietary blends aim at achieving the 'most' therapeutic effect using the interaction among the conventional phytotherapeutics and 'bioactive phytochemical constituents'.

There is a special integrative system that periodically checks an increase of gradual doses. The researchers have inferred that each person has a different reaction and so requires an individualized and progressive approach for nutraceuticals while using conventional drugs that need adjustment. The stepwise elevation approach is helpful because it avoids the occurrence of certain side effects and requires close monitoring of all patient responses. These doses are administered incrementally using the concept of personalized medicine that entails a dynamic plan due to changes affecting the patient's body. An integrative protocol involves routine tests such as the determination of blood sugar, kidney functioning, and HbA1c. Monitoring at intervals would allow for monitoring of the patient's response toward the integrative approach, thereby ascertaining the effectiveness of the nutraceutical components. Blood sugar concentration serves as an essential input variable for monitoring glycemic control and its impact on diabetes management. Also, different studies regarding renal function employing carbamid and creatinin indicators are done to ensure that patients do not contract side effects such as kidney problems, among others. Hence, HbA1C becomes a key indicator for determining the extent to which the integrative plan has been successful in managing NIDDM [15]. Using a tracking sheet, a health provider continuously monitors a patient's HbA1c level in order to measure the sustained effect of the protocol on its metabolic health. Likewise, these evaluations are conducted at regular intervals according to modern day health care systems considering various aspects of diabetic disorders. As a result, various nutraceuticals are being incorporated into the NIDSDM treatment plan, adding another dimension to NIDSDM control [16]. This proprietary blend increases dosage over time for me. For the first three days, the increment starts with 2x six drops per day [17]. To begin with, one adds each drop once every three days up to a total of ten drops per day. The next blend formula—capsules, starts with a dose of one capsule each day for seven days and then to two capsules daily. The third blend, which is packaged in sachets known as Blend III. Thus, in the sachets, the dosage is gradual. For instance, for the first week, half would be administered in the mornings and escalated to Blend IV – a teaspoon formula administered once daily in the mornings, whereas for Blend V, escalation would start with one teaspoon per night in the sixth blend, which is presented as a capsule consists of one capsule in the morning and another one late in the evening.

The results of this study were evident after one month and three months, confirming low blood sugar levels, better renal function, and HbA1c. Perhaps adding incremental doses together with frequent monitoring has proved successful. The controlled and gradual introduction of nutraceuticals could have helped in reducing side effects and enhancing synergy between nutraceuticals and conventional medical practises. Lastly, it integrates a protocol for the management of NIDDM through proprietary mixes A to H, with graded titration of dose and periodic assessments representing a new trend in health management in today's world [18]. This conforms to new trends in health care where positive influence from CAM and EBMs can be expected. This shows

that treatment is tailor-made for everyone, and the protocol applied is very systematic, with a phase for each patient. The use of nutraceutical therapy for improved management of non-insulin-dependent diabetes mellitus through an integrative approach [19].

2. Results

Utilization of integrative protocol for NIDDM led to marked improvements in critical measures, showing the positive impact of this strategy with reference to patients' overall health and comfort. An assessment at 1st and 3rd months also showed significant improvements in glycemic control that are highly essential in managing diabetes effectively. During one month and three months, good glycemic control represents an essential measure in protocol assessment. The low blood sugar trend depicts a good outcome towards the planned integrative intervention. Apparently, this was accomplished by carefully mixing herbal extracts with nutraceuticals in proprietary blends I to V. The primary aim of controlling NIDDM is glycemia because excessive sugar in the body damages several organ parts. One of its promised outcomes is improved glucose intake regulation; hence, this may help realize it as a whole concept [20].

Moreover, it was also noted that stabilization of blood glucose levels within the normal range could be listed among the significant findings during the check-ups. If blood glucose stays at normal levels, short-term complications are evaded. It is also one of the measures that prevent developing serious, long-term complications from diabetes. It is advised that nutraceuticals were slowly introduced to maintain stable blood sugar constantly. This demonstrates the need for an individualized integrative approach with adequate control over glucose.

Fatigue was one of the patient's presenting complaints and often signified uncontrolled diabetes mellitus. Particularly, an integrative approach is essential for decreasing blood glucose concentration and eliminating exhaustion/fatigue. A better fatigue level is an indicator of elevated energy levels and, consequently, good health status. Glycosuria, hyperinsulinemia, insulin resistance, body response influence, and other factors related to the disease process may combine to cause this fatigue syndrome. Thus, positive effect on fatigue and quality of life based on the above finding of the integrative approach, which tackles different facets of diabetes pathology. In addition, the patient records a weight loss of eight kilograms during this period, glycaemic control, and reduced fatigue. Weight control becomes essential in the care for NIDDM as obesity predisposes an individual to insulin resistance and eventually advanced diabetes disease. Supporting weight loss via integrative model based on lifestyle alterations plus nutraceuticals. This was a notable case because it addressed one of the major risk factors in diabetes and improved her whole metastatic state. Weight loss patients are hyper-insulinemic and hypoglycemic compared to other obese individuals who lose weight in the case of diabetes management. Moreover, they are less prone to suffer from cardiovascular

conditions such as strokes. The case study provides that a holistic approach to NIDDM therapy could be beneficial. By adopting an approach that entails combining conventional medicine, using appropriately selected nutraceuticals, and taking incremental doses of both while monitoring the progress, a sustained improvement in glycemic control can be achieved [21]. Because of this, the overall impact of the integrative protocol was beneficial to the patient's health. This was evidenced by a regulation of blood glucose within the normal range, lower fatigue, and marked weight loss. However, these outcomes provide evidence that diabetes management is specific to every individual and requires constant monitoring of regimen changes. This illustrates the integrative paradigm that concerns several NIDDM issues and develops individualized intervention. These findings will contribute to further research of other possible benefits that could result from integrating the approaches for the management of diabetes.

3. Discussion

Rationale for Integrative Protocol considering the complexity of NIDDM, which involves components of both insulin resistance and secretion deficiency, this integrative protocol had to be initiated. Therapy of diabetes mellitus of type II is commonly considered to be narrow and traditional; however, holistic management in the ketoacidosis state is much more required. Standardized drugs combined with modern dietary supplements target a specific condition called insulin resistance which is a part of NIDDM disease's pathophysiology. Lastly, choosing nutraceuticals is informed by modern studies exploring such elements as their impact on the prevention of diabetes. Natural bioactive products could be utilized to enhance insulin sensitivity and glucose metabolism. Further, it accommodates diverse sensitivity of some patients towards prescription drugs and nutraceuticals by way of individualized therapy regime". It involves graduated dosage escalation with daily routine surveillance in conjunction with adjusting to each patient's unique physical traits and responses [22]. Today, a tailor-made method suits the fashion according to the idea that there are as many diseases with different symptoms and treatment results as snowflakes. However, this integrative protocol is basically founded on its ability to consider in depth the intricate connection that exists between secretion and insulin resistance. This protocol integrates traditional drug therapy, nutraceutical therapy, and individualized application to overcome underlying disease mechanisms of NIDDM, thus achieving more lasting therapeutic effects. Such would be integration to the most holistic view of NIDDM, not only in terms of what was considered to be therapies but also reflecting current thinking of different aspects of NIDDM, which cannot be categorized as simply "multiple-facets" [23].

Comparison with Conventional Treatments

Additionally, when compared with the standard protocol for treating NIDDM, especially the first treatment using Metformin, it is seen that there are notable advantages together with high-quality outcomes. In the first month, the

Metformin (500 mg/day) plus dietary and exercise regimen did not manage to control the sugar as it remained high, and the fatigue issues persisted. This created a poor response that called for a change in therapy strategy, leading to the adaptation of this approach. In contrast, proprietary blends I–VI, which formed part of the integrative protocol, showed an improvement in glycemic control after six months, with subsequent improvement even on one-month and a three-month follow-up. Therefore, it adopted an integrative approach that combines evidence-based nutraceuticals with traditional medicines for the purpose of providing a better quality of care for NIDDM patients with particular complexity and individualized needs. The quality of life indicators that had been worse than those for the initial protocol improved. The initial presenting problems for the patient included wide variations in blood sugar levels, causing constant fatigue and no weight changes [24]. The normalization of blood glucose was seen following an increase of the nutraceutical substances with serial proprietary blends I–VI [25]. Stabilization was essential for IDDM management, as well as offering temporary relief from fatigue experienced by the client. There was an observation of 8kg loss within three months when this integrative protocol was used, showing that it works for cutting down on one of the main risk factors for the disease: obesity. That is, symptom reduction and weight management in the context of an integrated and patient-oriented approach are based on more holistic measures targeting not merely glucose levels but overall wellness as well.

Uncontrolled symptoms and blood glucose management were beyond the traditional treatment with Metformin only in NIDDM. The nutraceuticals inclusion also extended into the subsequent phase protocol, contributing towards addressing possible causes of insulin dysfunction due to insulin resistance and compromised insulin secretion. Nevertheless, nutritional supplements with evidence like those found in curcumin and provitamin antioxidants can be considered as medicine alternatives. They represent the modern concepts of individualized and integrated care, as well as the application of practical consideration for the multiformity of NIDDM [21]. Thirdly, it can be concluded that integrating approach has more impact as compared to first-line therapy with Metformin in NIDDM patients. The integrative protocol encompassing a low dose escalation, regular assessment, and evidencebased nutraceuticals had positive results on glycaemic control, symptom relief, and significant weight loss. However, the combination of all positives is indicative of a need for an overhaul when it comes to treating type 2 diabetes, involving much more whole-person and personalized approaches.

4. Conclusion

Lastly, the paper develops a powerful and original algorithm that adequately corresponds to the complicated NIDMM treatment method. This protocol is vital in that it combines herbal medicines, dietary supplements, and other lifestyle changes. This brings about a paradigm shift in adopting a holistic and personalized approach to tackling problems that

characterize diabetes. Such integrative strategy is derived from existing literature on the use of certain nutraceuticals, namely curcumin and carotenoids, for treating or preventing early-stage diabetes mellitus. A complex approach toward NIDDM includes classically recognized pharmacotherapy plus carefully selected nutraceuticals [26]. Therefore, the protocol is incremental in upping insulin, keeps track of each detail, and meticulously observes specific reactions that appear differently with each patient's response, hence reflecting such variations.

Therefore, this paper also features a case study illustrating an actual instance of the process that was successful when integrated. An old woman, age 60, suffering from NIDDM of heredity, associated hypertension, and cigarette addiction, did not have a good response to the first treatment with one drug – Metformin Tehran [27]. Through acceptance of these constraints, the integrative protocol was utilized, but it was effective in its various features. There were significant improvements in glucose management and relieving of symptoms weighing at eight kilograms after three months. Therefore, normalization of the blood sugar levels, reduction of fatigue symptoms, and remarkable fat-burning result in efficacy and multidirectional impact. These results deal with more than just the key aspects of the management of diabetes and have a lot of positive benefits for patients' health. This case study demonstrates that an integrative protocol was successful while also showing how a combination of standard treatments and food and lifestyle-based evidence treatments works well together.

Integrating health care should remain crucial in today's changed healthcare environment. Such an argument is more significant in diabetic therapy, where one has to use elaborate treatment strategies for a complicated disease – a disease such as diabetes. The described integrated practice proved that one can conduct person-focused diabetes management without using all of the traditional and additional approaches. This matches well with a paradigm shift in health care toward a more personalized and patient-centered model, recognizing that one-size fitall approach does not work in such a complex system as chronic disease care. Most significantly, the effectiveness of the protocol underscores the need to consider diabetes management as a whole rather than limiting it to glycemic control.

Surely, this is a worthy aim, but it misses out on the symptomatic picture, such as exhaustion and amazing body reduction, which do present some personalized and holistic treatment [28]. The integrative approach expresses all the components and holistic principles that influence the patient's status. Current care concepts focus on increased comprehension of health in comparison to illness centred approaches, and it fits in well. Thus, this paper concludes that the integrated diabetes care process, as stated earlier, is thorough and patient-oriented. Healthcare should incorporate tested medical technologies with alternative therapies in the long run and establish specific treatment plans for chronic illness management [29]. The case study

is more than enough proof that integrated approaches show some promise and so should be applied more widely for people living with type 2 diabetes to attain better health care outcomes.

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