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Review Article

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Can We Cure Diabetes, Tomorrow-Potentials and After Tomorrow's Perspectives?

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Abstract

Background: *In spite of tremendous investment in cure efforts of diabetes mellitus, still, no cure has been concluded for any type of diabetes. Control is the only solution option available so far, that help patients manage the signs and symptoms to certain limits, long term multiple complications is still face multiple long-term health complications*

Objectives: *To explore the potentials of looking to cure options for diabetes mellitus*

Methodology: *Systematic review of relevant literature study design has been carried out through utilizing specific key words at multiple medical search engines including PubMed, midline , Google scholar, and others , revising multiple technical reports and interviewing experts , more than 10 articles retrieved out of which 5 articles with strict selection criteria included in the study*

Results: *The current study reveals that Biotechnology progress is striving in seeing this opportunity to produce new diabetes therapy and chasing a cure. Currently, the major question will be what is brewing in the field and how it will change the way. It is recognized as one of the biggest hopes for developing diabetes cure, particularly type one diabetes. Replacing the missing insulin-producing cells could potentially recover normal insulin production and cure patients, in one of the platforms for a DRI Bio Hub, The donor islets were implanted within a biodegradable scaffold, made by combining the patient's own blood plasma with thrombin, and a frequently used, clinical-grade enzyme. Such substances together create a gel-like material, which adheres to the omentum and holds the islets in place. Currently, there are researches focusing on the glucose measurement process and injecting the right amount of insulin through what we call artificial pancreas.*

Conclusions: *Potentials of curing diabetes mellitus is not far away from now, significant investments and trials has been put in place*

Keywords: Diabetes, Cure, Perspectives

Diabetes Cure or control

In spite of tremendous investment in cure efforts of diabetes mellitus, still, no cure has been concluded for any type of diabetes. Control is the only solution option available so far, that help patients manage the signs and symptoms to certain limits, long term multiple complications is still face multiple long-term health complications. Biotechnology progress is striving in seeing this opportunity to produce new diabetes therapy and chasing a cure. Currently, the major question will be what is brewing in the field and how it will change the way.

Cell therapy Replacement with missing cells

Cell therapy of Diabetes mellitus, although it is still in the quite early stages of development, it is recognized as one of the biggest hopes for developing diabetes cure, particularly type one diabetes. Replacing the missing insulin-producing cells could potentially recover normal insulin production and cure patients. Nevertheless, early trials to pancreatic cells transplant, have been remarkably failed, specifically due to immune reactions that lead to destroying the implanted cells. The significant lack of donors is another limitation. Developing a bioengineered mini-organ one is one of the most advanced alternatives that comes from the Diabetes Research Institute in the US, where insulin-producing cells are encapsulated within a protective barrier. In 2016, it has been announced that the first patient in Europe treated with this approach in an ongoing phase I/II trial [1-5].

Insulin therapy is longer required

In one of the platforms for a DRI Bio Hub, The donor islets were implanted within a biodegradable scaffold, made by combining the patient's own blood plasma with thrombin, and a frequently used, clinical-grade enzyme. Such substances together create a gel-like

material, which adheres to the omentum and holds the islets in place. The biodegradable (biological) scaffold mixture then folded by the omentum over around. Across the time, the gel will be absorbed the body, leaving the islets intact, meanwhile new blood vessels to be formed to provide critical oxygen and other nutrients that support the survival of the cells. In spite of big promises, such biotechnologies are still far away from the existing market. Earlier, clinical trials have shown they do promising. Furthermore, the price might be steep, as still cell therapies for applications, like oncology, finding it difficult to get reimbursement from health insurance agencies and come with six-figure price tags. Putting that in Consideration, compared to cancer, diabetes is, not an immediately life-threatening disease, thus health insurers in many countries could be reluctant to cover the treatment.

Immunotherapy and origin targeting

Insulin-producing cells in type one diabetes are progressively destroyed by the immune system. As early enough Stopping this process, could preserve the cells and provide a cure, currently, there are researches focusing on the glucose measurement process and injecting the right amount of insulin through what we call artificial pancreas. Such a solution is still beyond reality and not ideal. "Presently, patients would still be dependent on insulin, glucose measurement, and even running up in closed loops that would come with a risk of hypoglycemia."

Artificial pancreas

A fully automated insulin delivery system is a new advance in diabetes research are making it possible to develop, without any input from the patient it could control blood sugar. It is called artificial pancreas that could exist within the next decade, three main challenges are still there, that scientists ought to address. Massive improvements in the technology used to control the sugar levels of people with type 1 diabetes and advanced type 2 diabetes, in the last decade, there have been. Now, there are new devices that monitor glucose every 5 minutes and send the information to the smartphone. Insulin pens are there to record how much insulin has used every time. Different types of insulin are available for different times of the day, pumps that can be programmed to deliver insulin over time according to patient needs at a given moment. Making predictions when the person is not eating or exercising, or if the sugar levels go too high or go too low, as will switch back to manual mode. 'Hybrid loop' system, Medtronic's device, whereas a fully automated system would be a 'closed-loop'.

Faster, better and smarter insulin

Current forms of insulin do not react quickly enough to big changes in blood sugar, which is one of the biggest challenges to create an artificial pancreas. For example, "Meal absorption is much faster than insulin absorption, after a meal. The researcher who researches artificial pancreas systems at McGill University in Quebec tells. "That is why to give insulin before the meal, so as it works at the same time the meal is absorbed. "Recently, Fiasp has been launched by Novo Nordisk, as a new generation of insulin that significantly acts faster than conventional insulin. Insulins take 10-20 minutes while most mealtime to start acting, Fiasp as the new generation of insulin, acts significantly faster than conventional insulin. Fiasp starts acting after a couple of minutes while most mealtime insulins take 10-20 minutes to start acting. However, its maximum effects are not reached until 1-3 hours later that means; it is not yet fast enough to initiates an artificial pancreas to operate quickly enough in response to blood glucose changes.

Multi-hormone systems

In a fully automated artificial pancreas, Insulin alone is unlikely to be enough to adequately regulate blood sugar levels. Furthermore, it is not the only hormone involved in regulating blood glucose in normal people. Amylin, a hormone that is secreted by the same cells that produce insulin. In addition, secreted in healthy individuals, but not exist in people with type one diabetes, "One of the things that this hormone does is slow the meal absorption, so insulin will have more chances to control the sugar levels. "Amylin also suppresses glucagon and decreases appetite— a hormone with the adverse effect of insulin that increases the levels of blood glucose through taking it from the body's natural reserves. Synergistically, amylin makes better work of insulin. With the help of pramlintide — an injectable form of amylin —can push significantly forward, closer to a fully automated artificial pancreas. At the time being, people with type one diabetes have to estimate the carbohydrates in each meal to calculate how much insulin they need. McGill University is carrying out a study where patients do not have. "The patient easily presses a button to say, 'I am eating.' No need to worry about the meal, whether it is small, medium or large. It is realistic to get there with pramlintide. The challenge for an artificial pancreas is having a formulation of insulin and amylin together, in spite of pramlintide is already available. It is not possible currently, because they need different conditions to be stable in liquid form. Developing such a combination of insulin and pramlintide by using Adocia its shielding technology. The formulation proved to reduce the spikes in blood sugar in the first trial in humans, after a meal when compared to a conventional insulin treatment.

Intelligent algorithms

The important piece in the puzzle is algorithms, which can automatically measure and control the blood glucose level. .exclusively, most of the progress in this front comes from universities and DIY communities, with groups US, UK and in Canada, steering innovation. Adapting algorithms need to be matched to the needs of every single person and their changing circumstances. For sure, it is not possible to use the same algorithm for everyone. Even for in one individual, things changing over time," "Adaptation, is essential, yet be careful not to adapt too much or too fast. Insulin need grows significantly in a patient that gets sick for a week. If the system must not think, the patient has become insulin resistant, as that will not work properly when the patient is healthy again.

Fully automated artificial pancreas

Is it possible to create a system that works as well as the pancreas of a healthy person? In the light of Hearing about the multiple challenges to creating an artificial pancreas, a significant question can be raised: "do we really need to be as good as a natural pancreas," in fact, "having good enough control to prevent complications is What we're interested in. as long as people live healthy lives, We don't need to get there ."Similar to an airplane flies without mimicking the way birds do, it is not necessary for artificial pancreas to work as similar to human pancreas dose. We need advances on all the different fronts to get there. "These are the pieces of a puzzle that we need all of them. Using a very good algorithm with slow insulin cannot work, and it cannot work if using very bad algorithm with a good insulin," key to make the development of an artificial pancreas faster and more affordable is by the technology of companies like Adocia and Arecor, which improves on existing drugs, patients don't

want to wait another 10-15 years waiting for that "There's a huge amount of pressure on insulin pricing around the world.

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