Double Diabetes: Introduction, Overview, and Literature Review

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Abstract

In this paper, we address double diabetes, a phenomenon infrequently discussed amongst experts.
It is said to come to be when individuals suffering from type I diabetes manifest with signs and symptoms suggestive of type II diabetes.
Double Diabetes (DD) is a peculiar phenomenon that has manifested itself as a possible occurrence in those suffering from type I diabetes. Despite the necessity for more studies that elaborate on how double diabetes comes to be, it seems as if increased BMI and increased insulin doses may be hypothesized as a goal. Other hypotheses, such as the immunological deficiency playing a role require more studies.

Keywords: Double Diabetes; Endocrinology; DD

Introduction:
The World Health Organization characterizes diabetes as a group of illnesses of a metabolic nature that are characterized by hyperglycemia and its adverse effects (1,2). It is agreed upon that, in general, two types of DM exist. Those being: Type 1 and Type 2 diabetes and are differentiated via clinical criteria (3). However, as it stands, double diabetes is only identified as occurring in individuals who manifest both types of diabetes. It is of the upmost importance that we study the natural course of development of double diabetes so as to evolve preventative methods (4).

Risk Factors:
Published data is insufficient to accurately state the prevalence of metabolic syndrome (MS) amongst the general population. However, it probably occurs at a 25% rate worldwide (2,5)
A study published in 2015 reported that a staggering 70 countries experienced doubling of obesity prevalence between 1980 and 2015 (6).

Type 1 Diabetes:
Individuals living with type 1 diabetes usually suffer from excess bodily weight and are either overweight or gain weight more rapidly than those who do not suffer from the illness (6,7).

Type 2 Diabetes:
This is a rather common condition that comes to be through gradual failure of pancreatic β-cells as well as insulin resistance (8,9).

Double Diabetes:
At first, the classification of diabetes seems rather straightforward. However, there exist cases (probably as much as 25% of all cases) (10,11) in which features diagnostic of both types manifest in a patient suffering from type 1 diabetes. In such cases, the patient is said to suffer from double diabetes (10,12–14). This was first elaborated to back in 1991 by Teupe and Bergis (15). Double Diabetes occurs seems to occur in individuals suffering from type 1 diabetes, especially those who are overweight (16–19). Despite this

indicating that double diabetes may be a progression of type 1 diabetes, it seems more likely that more pathophysiological phenomena are at play (10,20).
A case reported in 2003 (21) illustrated that Double Diabetes could present in individuals as young as 5 years of age.
Double diabetes can be diagnosed when, in addition to diagnostic features of Type 1 diabetes, family history of type 2 diabetes, hypertension, weight gain while receiving insulin, features of insulin resistance, and low HDL count are observed (22).

Epidemiology:
Prevalence of double diabetes can be estimated to be as high as 30% in individuals suffering from type 1 diabetes (9,16)

Pathophysiology:
Despite the discussion still ongoing (20), it is not implausible to hypothesize that insulin treatment, through its mechanism of action that could possibly result in weight gain, may itself play a role in the development of double diabetes (23).
The insulin resistance hypothesis (The accelerator hypothesis) is, by no means new, it was discussed as a possibility for the association between type I and type II diabetes back in 2009 (24).
The possibility of the established impaired immunity (decreased IgG concentrations) in individuals living with type I diabetes may play a role in the manifestation of double diabetes; however not enough such studies have been conducted (10,25–28).
It also seems plausible to hypothesize that double diabetes may result in adverse atherothrombotic manifestations (29).

Conclusion:
In conclusion, Double Diabetes (DD) is a peculiar phenomenon that has manifested itself as a possible occurrence in those suffering from type I diabetes. Despite the necessity for more studies that elaborate on how double diabetes comes to be, it seems as if increased BMI and increased insulin doses may be hypothesized as a goal. Other hypotheses, such as the immunological deficiency playing a role require more studies.

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