

MODIFIABLE RISK FACTORS OF PREDIABETES

NIRAJ KHATRI S APKOTA*

Department of Physiology, Chitwan Medical College, Chitwan, Nepal. Email: Nirajkhatri78@gmail.com

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ABSTRACT

The presence of prediabetes risk is independently associated with expanded waist circumference or obesity, or investigated laboratory value of low high-density-lipoprotein-cholesterol levels, high triglycerides (dyslipidemia), or measured persistently raised blood pressure (hypertension) and other miscellaneous factors such as eating and drinking habit. Association is stronger in male as compared to female, but abdominal obesity has stringent hold in both sexes to cause prediabetes. Recommendation has to be made on the basis of relative association to prevent or delay the onset of prediabetes to overt Type 2 diabetes; therefore, modifiable factors' recognition and applicatory improvement for the same are necessary. This review attempts to recognize in short of applicable relevant modifiable risk factors of prediabetes.

Keywords: Prediabetes, Obesity, Insulin resistance, Dyslipidemia, Hypertension.

INTRODUCTION

In this world, million people are suffering from prediabetes; especially in industrialized world, its epidemiology is rampant. The prediabetes status is given by the impaired fasting glucose (IFG) that ranges from 100 to 125 mg/dl and postprandial glucose tolerance references that warn microvascular complexities such as blindness, amputation, kidney failure; these are alike sign of a patient with diabetes complications. Some reports came with the course of mechanistic evidence involving atherosclerosis, thus causing dire risk to cardiovascular complication [1]. Following the course of prediabetes, risk approaching overt Type 2 diabetes in the near future is understood [2].

PATHOPHYSIOLOGY OF PREDIABETES

Prior to overt Type 2 diabetes a preliminary stage is introduced in human body, in which there occurs carbohydrate metabolism derangement, a phase of IFG or impaired glucose tolerance status referred to as prediabetes that is characterized by rapid early phase of insulin secretion to handle glucose uptake by muscle and adipose tissue, but it is relatively lower than normal condition. Contrary to this, the second phase of insulin secretion is delayed and prolonged herein displayed pathophysiology in prediabetes is almost same as that of Type 2 diabetes covering the baseline defect, namely, insulin resistance and early beta-cell failure. This thus results in unsteady insulin release and amplitude of large pulses is lost as supporting experimental evidence whereupon infusion of insulin in pulsatile fashion exactly same as in normal rapid oscillation shown effective hypoglycemia [3]. Therefore, the prediabetes proposed mechanism are elucidated on the basis of rates of glucose disappearance, rather than increased meal appearance or impaired suppression of endogenous glucose production regardless of their fasting glucose. In contrast, insulin secretion, action, and the pattern of postprandial turnover are essentially normal in individuals with isolated IFG [4].

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Abdominal obesity and body mass index (BMI)

Waist circumference is a measure of central obesity the tendency of fat volume to accumulate around the spacious region of the body, namely, waist region. Measuring weight, height, and their ratio that is BMI ≥ 30 kg/m² and reference of abdominal obesity the waist circumference ≥ 102 cm in men and ≥ 88 cm in women [5] are the two variables significantly associated with insulin resistance and thus prediabetes. The obesity either it be general or central is certainly be involved in different metabolic health risk, but the obvious mechanistic

view is yet to be clear. However, accumulated evidence bolster that it is caused to happen by insulin resistance and obesity-mediated inflammation precipitated by increase in abdominal fat [6]. However, statistic correlation of prediabetes showed rigorous direct association with waist circumference, the measure of precisely localized fat depot [7,8].

Hence, in brief, it can be stated that though mechanism underlying this is unsettled, it deemed to be due to excess adipose tissue volume that is reported to release free fatty acids which impair insulin internal signaling pathway causing it to be resistance in muscle and, in turn, lead to elevation of plasma glucose levels [9].

HYPERTENSION

Prediabetes occurs as a consequence of impairment of beta-cell functions and insulin resistance. An observation suggested that one reason of essential hypertension may be aftermath of that insulin resistance.

As individual with elevated blood pressure increases risk of prediabetes and this association declined with increasing BMI and age, report from cohort study and meta-analysis revealed that the association with elevation of systolic blood pressure of 20 mmHg hikes the risk of Type 2 diabetes by 58% and diastolic blood pressure of 10 mmHg, in this case, was linked with 52%. Later, this report was confirmed by a large and fairly long time conducted meta-analysis that made assurance of link, which documented 77% for hiked risk with 20 mmHg hiking of systolic blood pressure. Thus, it can be modified by framing oneself in daily modified healthy habitual lifestyle such as by making a habit of regular exercise, reducing salt intake, discontinuing smoking, and feeding healthy diet! [8,9].

DYSLIPIDEMIA

Although more focused with men, hypertension association with prediabetes is important; however, recent study also demonstrated the association of dyslipidemia, especially higher triglyceride level and low cholesterol adhered high-density lipoprotein (HDL) with prediabetes, but significant affiliation was only observed with HDL-cholesterol that is certain to play role of an independent risk factor for diabetes. Furthermore, when hypertension, dyslipidemia parameters are adjusted, all these association values stepped down greatly and attenuated status observed; this may be due to obesity inclusion in the study as evidence is supported by strong association between obesity and hiked blood pressure; hence, one study found that direct

effect of hypertension on prediabetes was confounded by waist circumference [10,11].

MISCELLANEOUS

First and foremost thing is always to remain relax be means be stress-free by learning and applying stress management technique such as listening to music, undergoing meditation, and having with restful night sleep, the most essential modifiable risk factors of prediabetes as well as of hypertension. As diet comprises the most easy modifiable risk factor, therefore, one should concentrate on diet adjustment and avoid sugar contained ingredient such as starch and fatty foods and focus on adding vegetables and non-carbohydrate fruits, reduce alcohol consumption in risky level, recruit exercise habit for 30 minutes at least 5 days a week, or indulge oneself in active sports such as running, swimming, biking, yoga, or tennis [12-14].

CONCLUSION

Gaining body weight that includes excess body fat, especially abdominal, has strong association with prediabetes; managing all the above-mentioned risk factors either medically or non-medically is necessary. Primarily, one is adjusted by improving lifestyle habit by giving especial attention in weight reduction. Other miscellaneous are performing physical activity, limiting alcohol consumption, leaving soft drink seeking habit, and eating healthy fresh food in right amount. All these modifications in habit will enable one to remain healthy and free from prediabetes. However, when medical or drug therapy is necessary or contemplated, then the preliminary aim would be targeted on dyslipidemia and hypertension because of its serious risk on cardiovascular disease.

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