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 Genetic Factors Related to the Incidence of Type II Diabetes in Adults

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INTRODUCTION

The global epidemic of type II diabetes has proven to exist as one of the greatest public health issues of our time, as well as the leading cause of death in the United States. Enhanced predictive, preventative and therapeutic methodologies are warranted to delay morbidity and mortality from this debilitating and deadly disease.

LITERATURE REVIEW

What genetic factors are responsible for the increasing incidence of type II diabetes among adults?

- Wu et al. (2014) and Yagatook and Frayling (2013) agreed, of the genetic loci associated with type II diabetes, mutations in KCNQ1 and KCNH2 are highly predictive of the disease.
- Franeushich et al. (2013) and Sun X(1), Y. W. (2014) reported the concept of pharmacogenomics (drug molecular mechanisms related to gene variants and drug efficacy) may eventually drive clinical decision making regarding type II diabetes drug selection, dose titration and adverse side effect avoidance. Based on the results of the studies in this review, accurate genetic data reveals potential to evolve clinically into a valuable instrument, thereby facilitating optimized therapeutics and preventing or ameliorating the onset of type II diabetes.

DISCUSSION

What findings support the genetic association with type II diabetes?

- Wu et al. (2014) conducted research that resulted in genetic loci related to hyperglycemic progression to type II diabetes.
- Franeushich et al. (2013) conducted research that resulted in genetic loci in proximity to genes which affect pancreatic beta cell development.
- Kato (2013) conducted research resulting in the discovery of type II diabetes genes located in unicellular organisms.
- Wu et al. (2014) conducted research resulting in type II diabetes concordance rates between monozygotic twins.
- Hanson et al. (2013) conducted a study resulting in inherited type II diabetes genes in Native American people.
- Su, Yu and Hu (2014) conducted research resulting in the utility of a concept known as pharmacogenomics.
- Pal and McCarthy (2013) conducted research resulting in clinical application of type II diabetes genetic data.

APPLICATION TO CLINICAL PRACTICE

- With more than 70 genetic loci identified that correlate to type II diabetes susceptibility, further investigation and narrowing of these novel findings is advised by those within the research community.
- Although several genetic variants have been identified and further studied for prediction value of type II diabetes, these genetic variants only marginally improved prediction beyond non-genetic characteristics in previous studies. Specific genetic loci such as KCN2 and PRDM16 serve as therapeutic targets for specific anti-hyperglycemic agents such as sulfonylureas and thiazolidinediones.
- Research suggests variations of multiple gene loci are correlated with clinical outcomes such as smoking tolerance, obesity, glycemic response and tolerability by individual patients.

REFERENCES

Frayling, I. G. (2013a). Recent progress in the identification of genes to understand links between type 2 diabetes and related metabolic traits. Genome Biology, 5-5.