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Maturity Onset Diabetes in Young (MODY)

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Date of submission: 13 – 4 – 2018

❖ Report submitted to fulfil the requirements for the report of the 3rd year

Abstract :
The aim of this report to discuss what is MODY, the different types and what is the mutation in each type of MODY, age of presentation also the risk to have MODY.

Introduction:
Maturity onset diabetes of the young referred to any of several hereditary form of diabetes mellitus caused by mutation in an autosomal dominant gene disrupting insulin production.
MODY is often referred as monogenic diabetes to distinguish it from the more common type of diabetes type I and II.
There are many subtype of MODY it self MODY I & MODY II are the most common types or form of MODY.
The term MODY dates back to 1964 when diabetes mellitus was considered to have main form juvenile onset type I and maturity onset type II, MODY applied to any child or young adult who had persistent asymptomatic hyperglycemia without progressive to diabetic ketoacidosis.

Discussion:
Maturity onset diabetes of the young can be defined by the clinical characteristic of early onset type II (non-insulin-dependent) diabetes and autosomal dominant inheritance.
Mutation in four genes have been shown to cause MODY: glucokinase, hepatic nuclear factor 1 alpha (HNF1α), hepatic nuclear factor 4 alpha (HNF4α) and insulin protein factor 1 (IPF1).
In white Caucasians it is now possible to define the gene in most patients with a clinical diagnosis of MODY.
Each gene involved in MODY has its own specific clinical and physiological characteristics. Patients with mutations of the glucokinase gene have mild fasting hyperglycaemia throughout life, and rarely require medication or develop microvascular complications.
The principle pathophysiology is stable beta-cell dysfunction characterized by reduced sensing of glucose by the pancreas.
Patients with mutations in HNF1α have normal glucose tolerance in early childhood and usually present with symptomatic diabetes in their late teens or early adulthood. They show increasing hyperglycaemia and treatment requirements with frequent microvascular complications.
The underlying defect is progressive beta-cell failure, with the early lesion characterized by failure to increase insulin secretion with increasing glucose levels. Patients with HNF4α and IPF1 mutations show a similar clinical picture to HNF1α although diabetes may be diagnosed later. There are other patients with MODY in whom the genetic defect is still unknown. Molecular genetic testing in patients with diabetes offers the possibility of making a firm diagnosis of MODY and allows prediction of the future clinical course.
The role of predictive testing in non-diabetic within families is uncertain at present. Preliminary evidence suggests that maintaining insulin sensitivity by avoiding obesity and regular physical exercise may help delay the onset of diabetes.

Conclusion :

According to data from Saxony, Germany, MODY was responsible for 2.4% of diabetes incidence in children younger than 15 years.
As management, in MODY2, oral agents are relatively ineffective and insulin in unnecessary, while in MODY1 and MODY3, insulin may be more effective than drugs to increase insulin sensitivity.
As mode of inheritance 50% of first-degree relatives will inherit the same mutation, while the other 50% have MODY but from different mutation.

Reference:

1- https://onlinelibrary.wiley.com/doi/abs/10.1002/(SICI)1096-9136(199801)15:1%3C15::AID-DIA562%3E3.0.CO;2-M (2018). .
2- https://www.nature.com/articles/384455a0#references (2018). .