Continuous Glucose Monitoring System (CGMS) in the Diagnosis of Early Glycemic Abnormalities in High Risk Groups.

Ashraf Soliman, Ahmed Elawwa, Aml Sabt, Nagwa Aldarsy

Departments of Pediatrics and emergency, Hamad General Hospital, P O Box 3050, Doha, Qatar.

Introduction
Continuous glucose monitoring (CGM) systems are an emerging technology that allows frequent glucose monitoring in real time.

Objectives
To assess the value of using CGM system (Medtronic) versus oral glucose tolerance (OGT) and glycated Hb (HbA1C) in the diagnosis of glycemic abnormalities (Prediabetes) in high risk groups.

Methods and Patients
We performed OGT and monitored glucose for 72h using CGMS combined with 4-5 times/day SGM (before 3 meals and midnight) and measured HbA1C concentration in 3 groups of children and adolescents with high-risk to develop glycemic abnormalities including:

A) 10 with morbidly obesity,
B) 16 with thalassemia major (TM) (on repeated blood transfusion and iron chelation)
C) 10 with nephrotic syndrome on high dose glucocorticoids (CS) for 4 weeks or more
D) As well as 10 normal children (controls).

Results and Discussion
None of the children and adolescents had elevated HbA1C level > 5.7%.

Glycemic abnormalities detected in all groups are summarized in table

<table>
<thead>
<tr>
<th></th>
<th>OGTT-IFG</th>
<th>OGTT-IGT</th>
<th>OGTT-DM</th>
<th>CGM-IFG</th>
<th>CGM-IGT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Normal</td>
<td>0%</td>
<td>0%</td>
<td>0%</td>
<td>0%</td>
<td>0%</td>
</tr>
<tr>
<td>TM</td>
<td>4/16</td>
<td>2/16</td>
<td>1/16</td>
<td>6/16</td>
<td>9/16</td>
</tr>
<tr>
<td>Obese</td>
<td>0/10</td>
<td>1/10</td>
<td>0/10</td>
<td>1/10</td>
<td>3/10</td>
</tr>
<tr>
<td>CS</td>
<td>0/10</td>
<td>0/10</td>
<td>0/10</td>
<td>0/10</td>
<td>3/10</td>
</tr>
</tbody>
</table>

Beta thalassemia with normal HbA1C and OGT and abnormal CGM

An adolescent on steroids with normal HbA1C, IGT and abnormal CGM

Obese adolescent with normal HbA1C, IGT and severe abnormalities in CGM

CGMS is more sensitive method to diagnose glycemic abnormalities (Prediabetes) in high risk patients compared to OGTT and HbA1C.