The Comparison of Plasma Homocysteine and C-Reactive Protein Levels in gestational diabetic patients and non-diabetic subjects
Gestational Diabetes = GDM

- **Definition**: Hyperglycemia with onset or first recognition during Pregnancy

- **Prevalence**: 3.7% in non-aboriginal, 8-18% in aboriginal populations

**Screening**: All women should be screened for GDM between 24-28 weeks
Physiology of GDM

- Gestational hormones induce insulin resistance
Diagnosis of Gestational Diabetes

Gestational Diabetes Screen (GDS)

1 hr after 50g load of glucose

<table>
<thead>
<tr>
<th>Value</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;7.8 mmol/L &lt;140mg/dl</td>
<td>no</td>
</tr>
<tr>
<td>7.8-10.2 mmol/L 140-200mg/dl</td>
<td>Yes 75 g OGTT indicated</td>
</tr>
<tr>
<td>10.3 mmol/L &lt; 200mg/dl</td>
<td>GDM</td>
</tr>
</tbody>
</table>
Diagnosis of Gestational Diabetes

75 g OGTT

- **GDM** = 2 or more values greater than or equal to

<table>
<thead>
<tr>
<th>Time</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fasting</td>
<td>$\geq 5.3$ mmol/L</td>
</tr>
<tr>
<td>1 hr</td>
<td>$\geq 10.6$ mmol/L</td>
</tr>
<tr>
<td>2 hr</td>
<td>$\geq 8.9$ mmol/L</td>
</tr>
</tbody>
</table>
Homocysteine
sulfur-containing amino acid
an intermediate product of methionine metabolism
different forms in plasma/serum
Studies

Plasma homocysteine levels is an independent risk factor for cardiovascular disease.

(Kuller., 2009; Hankey et al., 2010; Keebler et al., 2002)

Plasma homocysteine levels is normally $\leq 12$ micromol/L, but when it elevated has many deleterious cardiovascular effects.

(Warren. et al, 2009)

High homocysteine levels in plasma promotes oxidant injury to the vascular endothelium, and it damage leads to platelet activation and thrombus formation.

(Loscalzo et al., 2008; Maxwal. Et al, 2007)
C-reactive protein

- C-reactive protein (CRP) is an acute phase reactant made in the liver.

- CRP is released into the serum as a result of inflammation or tissue damage caused by infection, trauma, surgery, or other inflammatory disorders.

- Concentration levels in the serum could be a good indicator of heart disease, stroke or other diseases involving inflammation.
What does CRP bind to?

- CRP has the highest affinity for phosphocholine on bacteria or as a mixture of sphingomyelin and phosphatidylcholine in eukaryotic membranes.

- CRP can also recognize self ligands such as plasma lipoproteins, damaged cell membranes, damaged proteins, and apoptotic cells.
CRP and Cardiovascular Disease

• CRP is known to bind to damaged proteins.
• When CRP binds to LDL in plaques it creates an inflammatory response bringing in complement proteins and other inflammatory reactants.
• Inflammation in the plaque could cause blockage leading to a heart attack or stroke.
Plasma CRP levels is an independent risk factor for inflammation and cardiovascular disease.

(Libermann, 2010; Yamashita et al., 2006; Keebler et al., 2002)

CRP levels is normally $< \text{or} = 6 \text{ mg/dl in male,} < \text{or} = 5.1 \text{ mg/dl in female,} \text{ and but when it elevated has many deleterious in diabetes and cardiovascular disease.}$

(Karen. et al, 2009)

High CRP levels in increase plasma lipid and insulin tolerance. (Ferri et al., 2010; Mishigara Et al, 2007)
Materials & Methods

- The present study was undertaken in 50 gestational diabetic patients and 50 non-diabetic subjects that the age and sex matched healthy volunteers and consult to Hamedan Fatemyeh hospital.
- Their venous blood sample were collected and separated the plasma fractions.
- Then, the plasma Homocysteine levels were measured by Immonouassay Enzyme kit(Axis-Shield).
- The plasma CRP levels were measured by ELISA kit(Omega).
- Data analyzed by SPSS program.
### Results

Plasma **homocysteine** levels in gestational diabetic patients & non-diabetic subjects

<table>
<thead>
<tr>
<th>Factor</th>
<th>GDM (n=50)</th>
<th>Normal (n=50)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hcy (μmol/L)</td>
<td>9.92 ±0.6</td>
<td>8.5 ±0.3</td>
</tr>
</tbody>
</table>

*P<0.001
Plasma **C-reactive protein** levels in gestational diabetic patients & non-diabetic subjects

<table>
<thead>
<tr>
<th>Factor</th>
<th>GDM (n=50)</th>
<th>Normal (n=50)</th>
</tr>
</thead>
<tbody>
<tr>
<td>CRP (mg/dl)</td>
<td>12.3 ±0.8*</td>
<td>5.1 ±0.3</td>
</tr>
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*P<0.001
Conclusion

• These results showed that the plasma homocysteine and CRP levels were increased in gestational diabetic patients and thus it can be suggested that may be relationship between elevated these risk factors levels and increased risk of cardiovascular disease.
References:

Thank you!