Disclosure to Participants

• Notice of Requirements For Successful Completion
  • Please refer to learning goals and objectives
  • Learners must attend the full activity and complete the evaluation in order to claim continuing education credit/hours

• Conflict of Interest (COI) and Financial Relationship Disclosures:
  • Presenter: Celia Levesque – No COI/Financial Relationship to disclose

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• Off-Label Use:
  • Participants will be notified if a product is used for a purpose other than for which it was approved by the Food and Drug Administration.
Objectives

- Describe effects of Ca tx on BG
- Discuss tx options for managing DM in pts with Ca
- Manage DM in pts with Ca

What we will cover

Ca meds causing hyperglycemia/DM
- Immune checkpoint inhibitors
- M-TOR inhibitors

Mgt of DM for pts with Ca receiving steroids
- Low dose steroids vs High dose steroids
- Oral agents vs Insulin therapy
- Insulin regimens for steroids

Mgt of DM for pts with Ca receiving TPN
- Dosing insulin in the bag
What we will cover

Mgt of DM for pts with Ca receiving TF
- Determining the CHO content of common TF
- Calculating insulin doses for TF
- Managing basal requirements

Surgical Mgt of DM for pts with Ca
- Taking a history
- Creating a DM plan based on the history

Managing insulin drips
- Transitioning IV to SC insulin

Checkpoin t Inhibitors

Cytotoxic T-cell-associated antigen (CTLA-4)
- Ipilimumab

Programmed cell death protein-1 (PD-1)
- Nivolumab
- Pembrolizumab
- Cemiplimab

Programmed cell death ligand-1 (PD-L-1)
- Atezolizumab
- Avelumab
- Durvalumab

Inhibitors
P13K-AKI-mTOR Inhibitors

Act on mTOR signaling pathway which plays role in cell growth, lipid and glucose metabolism

Associated with 13-50% incidence of hyperglycemia/new onset diabetes

- Everolimus/Afinitor
- Temsirolimus/Torisel
- Sirolimus/Rapamune

Steroid Induced Diabetes

Steroid Diabetes

Immunosuppression
Hyperglycemia
Insulin resistance
Insulin deficieny
Muscle atrophy
Skeletal muscle
Capillary recruitment
Microcirculation
Steroid diabetes

Immunosuppression
Hyperglycemia
Insulin resistance
Insulin deficieny
Muscle atrophy
Skeletal muscle
Capillary recruitment
Microcirculation
Steroid diabetes
<table>
<thead>
<tr>
<th>STEROID</th>
<th>EQUIVALENT</th>
<th>ONSET</th>
<th>DURATION</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dexamethasone</td>
<td>0.75 mg</td>
<td>Rapid</td>
<td>48-72 hours</td>
</tr>
<tr>
<td>Hydrocortisone</td>
<td>20 mg</td>
<td>Rapid</td>
<td>12-24 hours</td>
</tr>
<tr>
<td>Methylprednisolone</td>
<td>4 mg</td>
<td>Rapid</td>
<td>30-36 hours</td>
</tr>
<tr>
<td>Prednisolone</td>
<td>5 mg</td>
<td>Rapid</td>
<td>18-36 hours</td>
</tr>
<tr>
<td>Prednisone</td>
<td>5 mg</td>
<td>Rapid</td>
<td>30-36 hours</td>
</tr>
</tbody>
</table>

**Steroids: ac BG < 200 mg/dL**

If no hx DM, DM well controlled on OA, or low dose steroids

- Metformin
- Sulfonylurea
- TZD
- DPP-4
- GLP-1 RA

If persistent hyperglycemia, add insulin

**Steroids: Adding Insulin**

If no fasting hyperglycemia, start with prandial insulin: 0.1 unit/kg per meal

- Rapid acting insulin if no snacking
- Regular insulin if snacking

If fasting hyperglycemia: start basal insulin 0.1-0.3 units/kg/day
Steroids

**Low Dose: < 40 mg dex qd**
- 40% basal
- 60% bolus

**High Dose: > 40 mg dex qd**
- 25% basal
- 75% bolus

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**Adjustment of Insulin**

- > 200 MG/DL: INCREASE DOSE 20%
- > 300 MG/DL: INCREASE DOSE 30%
- > 400 MG/DL: INCREASE DOSE 40%

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**TPN**

- Calculate grams of carbohydrate per bag
- Start with 1 unit Regular insulin per 10 gm CHO to be put into the bag. Adjust dose as needed
- Correctional scale
- If ICR is correct, the it won’t make a difference if it is continuous or cycled
**Tube Feeding**

<table>
<thead>
<tr>
<th>Tube Feeding Product</th>
<th>CHO per L</th>
</tr>
</thead>
<tbody>
<tr>
<td>Osmolite 1.2</td>
<td>158 gms</td>
</tr>
<tr>
<td>Fibersource HN</td>
<td>160 gms</td>
</tr>
<tr>
<td>Isosource 1.5</td>
<td>170 gms</td>
</tr>
<tr>
<td>Diabetisource AC</td>
<td>180 gms</td>
</tr>
<tr>
<td>Novosource Renal</td>
<td>200 gms</td>
</tr>
<tr>
<td>Vivonex RTF</td>
<td>175 gms</td>
</tr>
<tr>
<td>Peptamen AF</td>
<td>187 gms</td>
</tr>
<tr>
<td>Peptamen 1.5</td>
<td>188 gms</td>
</tr>
<tr>
<td>Resource Breeze</td>
<td>230 gms, 53 for 240 ml can</td>
</tr>
<tr>
<td>Glytol</td>
<td>100 gms, 24 for 240 ml can</td>
</tr>
</tbody>
</table>

**Calculating CHO in Tube Feeding**

- **Multiply rate of TF x hrs to get total mL**
  - Multiply mL by the CHO content per 1 liter
  - **Example:** Osmolite 1.2 (158 gm/L) at 60 mL/hr continuous 24 hrs per day
  - 60 mL/hr x 24 hrs = 1440 mL per 24 hrs
  - 1440 x 0.158 = 227 gms CHO per 24 hrs
- **Match insulin regimen to needs**

**Calculate Insulin dose for TF**

- **Calculate amt of CHO for time TF running**
  - 1 unit per 6-8 gm CHO:
  - **Calculate a correctional scale**
  - If pt has a basal need, factor that in
  - If pt is eating, may need prandial insulin
Insulin Regimens for TF

- Basal/bolus
  - Reg or 70/30 insulin q 6 hrs
  - Rapid acting insulin q 3-4 hrs

Surgery: History

- Type and duration of DM
- DM complications
- Other co-morbid conditions
- Glycemic control
- Hypoglycemia hx
- Type and duration of surgery
- Duration of surgery
- Duration of fasting

Surgery

- If low C-Peptide will still need basal insulin but after 16 hrs of fasting, liver glucose drops and may need reduced dose
- No prandial insulin
- Correctional insulin for hyperglycemia
- Avoid stacking short/rapid acting insulin
Transiting off Insulin Drip

Determine avg hourly rate over past 8 hours
Multiply x 24 hrs to get total daily dose
Convert 70% of the daily IV dose to SC insulin
  • 50% basal insulin
  • 50% bolus (divide by 3 meals)
  • If enteral feedings: use regular insulin and divide by 4
    and give every 6 hours
  • Order correction insulin