NUTRITION PLANNING FOR
PRE AND POST
LIVER TRANSPLANT

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HEAD DEPARTMENT OF DIETETICS
APOLLO HOSPITALS (MAIN)
CHENNAI
PRE - OPERATIVE
Case Presentation

• Name: Mr. XXX
• Age: 51yrs
• Sex: Male
• No. of days in the hospital: 23
Present History of Illness

- Decompensated chronic Liver disease with diarrhoea
- Altered sensorium
- Abdominal distension
Past History of Illness

<table>
<thead>
<tr>
<th>Admission</th>
<th>Chief Complaints</th>
</tr>
</thead>
<tbody>
<tr>
<td>1&lt;sup&gt;st&lt;/sup&gt; - Evaluation</td>
<td>Diarrhoea</td>
</tr>
<tr>
<td>2&lt;sup&gt;nd&lt;/sup&gt; - After 1 month</td>
<td>Diarrhoea, general weakness, blurred vision</td>
</tr>
<tr>
<td>3&lt;sup&gt;rd&lt;/sup&gt; - After 15 days</td>
<td>Hepatic encephalopathy</td>
</tr>
<tr>
<td>4&lt;sup&gt;th&lt;/sup&gt; - After 2 months</td>
<td>Diarrhoea, abdominal distension</td>
</tr>
</tbody>
</table>

Past Admissions - Decompensated CLD
Nutrition Screening

• Nutrition screening was done on admission as a routine by the doctor and referred to the Dietitian for further assessment
Nutrition Assessment

Subjective Global Assessment (SGA)

A. Patient related medical history

Anthropometry

Height: 184cms ; Weight: 60.4kg ; BMI: 19

• Weight change
  • weight loss – 9%

• Diet history – Moderate overall decrease
  • due to ascites, diarrhoea, abdominal pain etc.,

• GI symptoms
  • nausea, diarrhea, abdominal pain etc.,

cont....
Nutrition Assessment

• Functional capacity – Difficulty in normal activity

• Co-morbidity – Decompensated CLD, with diarrhoea, altered sensorium and abdominal distention

B. Physical examination

- Muscle wasting - present
- Fat stores – decreased
- Presence of Ascites – yes

cont....
**SUBJECTIVE GLOBAL ASSESSMENT (ADULTS)**

(A) Patient's related medical history

1. Weight change (overall change in past 6 months)

<table>
<thead>
<tr>
<th>Change</th>
<th>Score</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>No weight change or gain</td>
<td>3</td>
<td>Minor weight loss &lt;5%</td>
</tr>
<tr>
<td>Weight loss 5-10%</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>Weight loss 10-15%</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Weight loss &gt;15%</td>
<td>0</td>
<td></td>
</tr>
</tbody>
</table>

2. Dietary Intake (Duration)

<table>
<thead>
<tr>
<th>Change</th>
<th>Score</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>No change</td>
<td>3</td>
<td>Sub-optimal solid diet</td>
</tr>
<tr>
<td>Full liquid diet or moderate overall decrease</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>Hypocaloric liquid starvation</td>
<td>1</td>
<td></td>
</tr>
</tbody>
</table>

3. Gastrointestinal Symptoms (Duration)

<table>
<thead>
<tr>
<th>Symptom</th>
<th>Score</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>No symptoms</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>Vomiting or moderate GI symptoms</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>Diarrhoea, severe anorexia</td>
<td>1</td>
<td></td>
</tr>
</tbody>
</table>

4. Functional Capacity (Nutrition related functional impairment)

<table>
<thead>
<tr>
<th>Activity</th>
<th>Score</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>None / improved</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>Difficulty with ambulation</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>Difficulty with normal activity</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Bed/chair-ridden with no or little activity</td>
<td>0</td>
<td></td>
</tr>
</tbody>
</table>

5. Co-morbidity (Disease and its relationship to nutritional requirements)

<table>
<thead>
<tr>
<th>Co-morbidity</th>
<th>Score</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Healthy</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>Mild co-morbidity</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>Moderate co-morbidity or age &gt; 75 years</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>Severe co-morbidity</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>Very severe multiple co-morbidity</td>
<td>-1</td>
<td></td>
</tr>
</tbody>
</table>

(B) Physical Examination

1. Decreased fat stores or loss of subcutaneous fat

<table>
<thead>
<tr>
<th>Stage</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>Normal (no change)</td>
<td>3</td>
</tr>
<tr>
<td>Moderate</td>
<td>2</td>
</tr>
<tr>
<td>Severe</td>
<td>1</td>
</tr>
</tbody>
</table>

2. Signs of muscle wasting

<table>
<thead>
<tr>
<th>Stage</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>Normal (no change)</td>
<td>3</td>
</tr>
<tr>
<td>Moderate</td>
<td>2</td>
</tr>
<tr>
<td>Severe</td>
<td>1</td>
</tr>
</tbody>
</table>

Total Score = Sum of above 7 components

**Nutritional Status:** Based on this score patient is:

- **Well nourished**: 7-14
- **Moderately malnourished**: 15-28
- **Severely malnourished**: 29-35

Height __________ cm
Current weight __________ kg.

Dietitian ______________________ Date _______________
Subjective Global Assessment (SGA) Score

<table>
<thead>
<tr>
<th>Factors</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>Weight change</td>
<td>3</td>
</tr>
<tr>
<td>Diet history</td>
<td>3</td>
</tr>
<tr>
<td>GI symptoms</td>
<td>4</td>
</tr>
<tr>
<td>Activity Level</td>
<td>3</td>
</tr>
<tr>
<td>Comorbidity</td>
<td>4</td>
</tr>
<tr>
<td>Muscle wasting</td>
<td>3</td>
</tr>
<tr>
<td>Fat stores</td>
<td>3</td>
</tr>
</tbody>
</table>

- Total score of the seven components = 23
- Rating – Moderately malnourished
Nutrition Care Plan

• Pre OP Nutrient recommendations

Energy Requirement

• 1.2 to 1.4 times of BEE (approx 30-35 Kcal/Kg/day)
  • BEE using Harris Benedict equation : 1679
  • AEE : 1.3 × BEE - 2309
  • 60 – 70 % of calories as complex & simple CHO

• American Association for the Study of Liver Disease
Nutrition Care Plan

Pre OP Nutrient recommendations

Protein Requirement

• Minimum 1.0 – 1.2 g/kg to 1.5g/kg

Predisposition weight - 75 × 1.2 = 90

• To maintain
  - Muscle mass
  - Protein levels in the blood

• Hepatic Encephalopathy
  - Limit 0.6 – 1.0g/kg
  - BCAA formula

• American Association for the Study of Liver Disease
Nutrition Care Plan

• Salt Restriction

  0 - 5 g / day

• Fluid Restriction

  1 – 1.25 litres / day

• Individualized
Diet prescription during hospital stay

<table>
<thead>
<tr>
<th>Day</th>
<th>Diet Order</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>SF, 1000ml F/R, Semi Solid Diet with Nocturnal RTF@ 50ml/hr (9pm – 7am)</td>
</tr>
<tr>
<td>3</td>
<td>SF, 1000ml F/R, RTF@ 40ml/hr with Semi Solid Diet</td>
</tr>
<tr>
<td>10</td>
<td>5g S/R, 1250ml F/R Diet including Nocturnal RTF@ 60ml/hr (9pm – 7am)</td>
</tr>
<tr>
<td>13</td>
<td>5g S/R, 1250ml F/R RTF @ 50ml/hr with Diet</td>
</tr>
<tr>
<td>20</td>
<td>4g S/R, 550ml F/R Diet with 70ml/hr Nocturnal RTF (9pm – 7am)</td>
</tr>
</tbody>
</table>
Nutrition Education

• Educated on the salt and fluid restrictions
• Emphasized on
  • Increased caloric and protein intake
  • Importance of tube feed
• Small frequent meal with high calorie snacks
Nutrition monitoring

- Oral intake was monitored using a food and fluid chart
- Daily intake was monitored by the Dietitian
- Calorie and protein were met by oral diet and tube feed
- Labs: Hb, Serum Albumin, Lymphocytes, Na, K etc.,

cont…
Nutrition monitoring

Daily Energy Intake

- Calories
- Days
- Energy (Calories)
Nutrition monitoring

Daily Protein Intake

Protein (gms)

Days

Protein (g)
Reasons for Deviation

• Intolerance
• Salt & fluid restriction
• Abdominal Pain
• Hepatic encephalopathy
• Nausea
Discharge Education

- Discharge Diet - 4g Salt, 1250ml F/R, diet with nocturnal RTF@ 60ml/hr for 10hrs

- Educated the patient & family

- Diet Chart was provided
Calorie intake during various admissions

Calorie Intake during Various Admissions

- Calories
- 1st Adm
- 2nd Adm
- 3rd Adm
- 4th Adm
- 5th Adm
Protein intake during various admissions

Protein Intake during various admissions

Protein (g)

1st Adm | 2nd Adm | 3rd Adm | 4th Adm | 5th Adm
POST – OPERATIVE
Nutrition Assessment

- Post OP nutrition assessment was done using SGA
- SGA score – 21
- Moderately Malnourished
Immediate Post-operative state

Nutrition Status is affected by
- Graft function
- Pre-existing malnutrition
- The stress response to surgery
- Catabolic effects of high dose steroids
Nutrition Care Plan

• Post OP Nutrient recommendations

Energy – 1.2 – 1.3 times BEE
- BEE using Harris Benedict equation: 1679
- AEE : 1.3×BEE - 2309 calories

Protein - 1.3 – 2g / kg / day
- Predisposition weight - 75 × 1.3 = 98g

• American Association for the Study of Liver Disease
Immediate Post - operative Diet

• Day 1 - Clear liquids from 6pm
• Day 2 - Soft Solid diet from afternoon
• Day 3 - Normal diet
• Day 6 - Low Potassium diet
• Day 10 - Normal diet
Nutrition monitoring

Daily Calorie Intake

<table>
<thead>
<tr>
<th>Post OP Days</th>
<th>Calories</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1500</td>
</tr>
<tr>
<td>2</td>
<td>1500</td>
</tr>
<tr>
<td>3</td>
<td>2500</td>
</tr>
<tr>
<td>4</td>
<td>2500</td>
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<tr>
<td>5</td>
<td>2000</td>
</tr>
<tr>
<td>6</td>
<td>2000</td>
</tr>
<tr>
<td>7</td>
<td>2000</td>
</tr>
<tr>
<td>8</td>
<td>2500</td>
</tr>
<tr>
<td>9</td>
<td>2500</td>
</tr>
<tr>
<td>10</td>
<td>2500</td>
</tr>
<tr>
<td>11</td>
<td>1500</td>
</tr>
<tr>
<td>12</td>
<td>1500</td>
</tr>
</tbody>
</table>
Nutrition monitoring

Daily Protein Intake

Post OP Days

Protein (g)
Reasons for Deviation

- Post OP stress
- Pain
- Cultural differences
Discharge Diet Education

• Educated the patient & family on post transplant diet protocols
• Diet Chart was provided
Guidelines for food hygiene

- Foods should be cooked thoroughly and eaten
- Meals should be served hot and never reheated
- Do not use leftovers
- Food should be eaten fresh and well within the “use by date”
Guidelines for food hygiene

• Individual small packets of foods and drinks - advised

• Hand wash - Emphasized

• Only thick-skinned fruits are permitted

• Use of separate cutting board - prevent cross-contamination

• Non-vegetarian foods should be very well cooked
Guidelines for food hygiene

• Eating out is restricted for 6 months

• When eating out,
  • Avoid salads, raita, fresh fruits etc.
  • Avoid eating in unclean eat outs

• Drink boiled cooled water
THANK YOU