A Case Study: Multiple Sclerosis

Kayla Jensen
February 2013
Patient Profile

- SL is a 59 year old Caucasian Woman
- Lives in Utah
- Retired School teacher
- Separated from husband
- No Hx of tobacco/alcohol use
Patient Profile

- Children are primary care providers
- Medical HX
  - Multiple Sclerosis (MS)
  - Decubitus ulcers
  - Chronic debilitation
  - PEG tube
  - Baclofen Pump
  - Seizures
  - Hospitalized last year for aspiration pneumonia
Present Illness
Present Illness

- January 4th
  - Outpatient clinic
  - Dx with upper respiratory infection
    - Course of doxycycline antibiotics and sent home
  - Feeling better
  - Chronic cough
Present Illness

- January 23rd presented to the ER
  - Hypersomnolent
    - Saturations in 60s
    - pCO2 in 70s
  - Chest x-ray
    - Bilateral infiltrates consistent with pneumonia
Present Illness

- Admitted to the hospital
  - Septic shock and hypoxemic respiratory failure secondary to bilateral aspiration pneumonia
  - Intubated
- UTI
- Severe Malnutrition
- Decubitus Ulcer on R-buttock
Present Illness

- January 24\textsuperscript{th}
  - NG tube placed and tube feedings started
  - Developed refeeding syndrome
    - Hypophosphatemia
      - P 2 mg/dL
    - Hypokalemic
      - K 3.1 mmol/L
  - Resolved after 3 days with slow feeding and thiamine replacement
Present Illness

- January 25th
  - Lungs: haemophilus influenza
  - Urine: Pseudomonas
  - Baclofen pump refilled
  - Transitioned to Pressure support
  - SL was awake
    - Trying to speak by moving lips and left arm
  - PEG wound healing
Present Illness

- **January 26th**
  - Breath sounds improving
  - Plan: Begin to wean off pressure support
  - MD discussion with SL and daughter
    - SL still critically ill
      - Reason for intubation & pneumonia was chronic aspiration
      - What you find pleasure in in life?
        - Trachea tube Vs. PEG
Present Illness

- **Option 1: NONE**
  - Eat whatever by mouth
  - Risk aspiration
  - Not be able to be intubated

- **Option 2: PEG placement**
  - No food PO
  - Intubated
Present Illness

- Option 3: Trachea Tube
  - Take food PO
  - Supplement with temporary FT

- **Option 4: Trachea tube & PEG**
  - Take in food PO for pleasure
  - Nutrition needs met through PEG
  - Intubation PRN
Present Illness

- January 27\textsuperscript{th}
  - Trials to wean off pressure support
    - Fatigue easily
    - Back to assist control
- January 28\textsuperscript{th}
  - No new Changes
Present Illness

- January 29th (Day 7 ICU)
  - SL remains critically ill
    - Ventilator dependent
    - Hemodynamically unstable
  - Tolerating intermittent pressure support trials longer
  - Chest x-ray
    - Improvement in bilateral lobe infiltrates
  - Tube Feeding adjustment
Present illness

- January 30th
  - Ventilator setting adjusted
    - More sensitive to SL’s inspiration efforts
    - Tolerate pressure support longer
  - Family Discussion
    - Long term care of SL
      - ICU, IMC, LTAC, nursing home
Present Illness

- January 31\textsuperscript{st}
  - PEG placement
  - Percutaneous tracheostomy
  - Ventilator dependent
- January 4\textsuperscript{th}
  - Wound to buttock debrided
Present Illness

- January 6th
  - SL discharged
    - Transferred

- TOTAL: 15 days in ICU
Multiple Sclerosis
Multiple Sclerosis (MS)

- Autoimmune disease of CNS
- Destruction of the myelin sheath
  - Myelin sclerosis
  - Replaced with scar tissue
Etiology

- No known cause
- Suggested genetic component
- Prevalence: 2.5 million people
  - Lower: equatorial regions, southern USA and Europe
  - Higher: Canada, northern USA and Europe
    - Linked to sun exposure
      - Vitamin D3: selective immune system regulator
Pathogenesis

- Relapse Remitting MS (RRMS)
  - Most common
  - Distinct relapses
    - Acute onset of clinical dysfunction
    - Symptoms resolve
    - Full recovery with minimal lasting effect
  - No disease progression between relapses
Pathogenesis

- Secondary Progressive MS (SPMS)
  - RRMS with progression of disease with and without relapses
  - Most neurological damage
Pathogenesis

- Primary Progressive MS (PPMS)
  - Less common form
  - Steady progression and decline from onset
  - Without acute attacks

- Progressive relapsing MS (PPMS)
  - Steady progression and decline
  - Relapses with and without full recovery
  - Progresses between relapses
Pathogenesis

- **Benign MS**
  - Fully functioning 15 years after disease onset

- **Malignant MS**
  - Rapid disease course
    - Substantial disability
Pathogenesis

- Some people:
  - experience only 1 or 2 neurologic episodes
    OR
  - Chronic, relapsing, or progressive disease that lasts for many years
    - Neurological disability collects.
Clinical features

- No specific
- Signs and symptoms that are common among individuals with MS
Signs and Symptoms

- Onset between 20-40 years old
- Typically starts with eyes
  - Blurred or double vision
  - Red-green color distortion
  - Blindness in one eye
- Paresthesias
  - Sensation of numbness/prickling
    - “pins and needles”
Signs and Symptoms

- Weakness in the extremities
- Problems with:
  - Coordination
  - Gait
  - Balance
- Spasticity - tight/stiff muscles
- Tremors
- Dizziness
Signs and Symptoms

- Speech impediments
- Cognitive impairments
  - Concentration
  - Attention
  - Memory
  - Depression
- Partial or complete paralysis
Diagnosis

- MRI
- McDonald Criteria
  - Dissemination of CNS lesions in both space and time
    - Time: Development of new lesions in brain or spinal cord
    - Space: multiple lesions in brain and/or spinal cord
Treatment

- No proven treatments
- Neurological deficits make it hard to recover
- Medical treatment
  - Max recovery from initial attacks
  - Prevent fatigue and infections
Treatment

- Rehabilitation treatment
  - Physical Therapy and exercise
    - Preserve remaining function of muscles
- Various Aides
  - Braces, canes, walkers
    - Mobility and independence
- Short term steroid therapy
  - Reduce the length and severity of attacks
  - Adrenocorticotropic hormone (ACTH), prednisolone
Treatment

- Medication
- RRMS
  - Beta Interferons: Avonex, Betaseron, Refib
    - Dec # of exacerbations of MS, slow progression and disability
  - Copaxone - synthetic myelin protein
  - Novantrone (mitoxantrone)
    - Immunosuppressant
- Baclofen
  - Helps with spasticity
Nutrition status

- Proper nutrition not found to delay progression
- Neurological deficits and dysphagia
  - Diet modification/consistency
  - Delivery method
- Impaired vision, poor ambulation
  - Difficult food preparation
Nutrition Assessment
Food/ Nutrition HX

- PTA SL receiving nutrition via PEG
  - 3 months PTA SL passed modified barium swallow
    - PEG removed
- SL was eating and aware reported knowing she was aspirating
- Small Bowl feeding tube placed upon admit on 1/23/13
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<tr>
<td>Impact w/ Fiber</td>
<td>40 ml/hr</td>
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<tr>
<td>Glutamine</td>
<td>15g BID</td>
<td>15g BID</td>
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<tr>
<td>Beneprotein</td>
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<tr>
<td>Theragran-M</td>
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<tr>
<td>Zinc Sulfate</td>
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<tr>
<td>Vitamin C</td>
<td>500 mg BID</td>
<td>500 mg BID</td>
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<tr>
<td>Thiamin</td>
<td>100 mg</td>
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**TOTAL:**
- 1990 kcal (26 kcal/kg)
  - 96 g Protein (2.1 g/kg)
- 2260 kcal (28 kcal/kg)
  - 102 g Protein (2.3 g/kg)

**Food/ Nutrition HX**

- Diet orders LOS
- 1/23 start at 15 ml/hr and advanced
Food/ Nutrition HX

- New PEG placement 1/31/13
  - Tube feeds held for placement
  - Feeding administered through PEG 2/1/13
SL’s family reported ongoing, unintentional weight loss PTA

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<th>Weight (Kg)</th>
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<th>%IBW</th>
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<td>60</td>
<td>47</td>
<td>20.2</td>
<td>104</td>
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Biochemical Data

**Albumin**

- 23-Jan: 4
- 25-Jan: 3.5
- 27-Jan: 3
- 29-Jan: 2.5
- 31-Jan: 2
- 2-Feb: 1.5
- 4-Feb: 1

Legend: Albumin
Biochemical Data

CRP and Prealbumin

24-Jan 25-Jan 26-Jan 27-Jan 28-Jan 29-Jan 30-Jan 31-Jan 1-Feb 2-Feb 3-Feb 4-Feb 5-Feb 6-Feb
Medical Procedures

- PEG placement
- Percutaneous Tracheostomy
- Baclofen Pump refill
Nutrition Focused Physical Findings

- Emaciated appearance
- Muscle wasting
- Sedated and intubated
- Chronic disability
  - Use of only left arm
- Unstageable decubitus ulcer – R buttock
  - 5 X 3.5 X .2
  - Covered with black eschar and necrotic
Nutrition Focused Physical Findings

- Open wound from PEG removal
- Healing area on right heel
Comparative Standards

- Vent Dependent
- Wounds

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<th>Protein</th>
<th>Fluid</th>
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<td>Range</td>
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<td>1.5-2 gm/kg</td>
<td>30-35 ml/kg</td>
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<tr>
<td>Average</td>
<td>1000-1125 kcal</td>
<td>70-90 g</td>
<td>1350-1575 ml</td>
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Client History

- 59 YO, Caucasian Female
- End stage MS
- Bedbound
- Lives with daughter
- HX: decubitus ulcers, chronic debilitation, PEG tube, seizures, aspiration pneumonia
Nutrition Diagnosis
Nutrition Diagnosis

- Malnutrition related to inadequate oral intake, chronic debility as evidenced by emaciated appearance, muscle wasting, reported weight loss.
- Increased nutrient needs related to healing as evidenced by decubitus ulcer to buttock and healing PEG site.
- Inadequate oral intake related to respiratory failure as evidenced by mechanical ventilation.
Nutrition Intervention
Problem 1: Malnutrition related to inadequate oral intake, chronic debility as evidenced by emaciated appearance, muscle wasting, reported weight loss

- **Intervention:** Food and/or Nutrient Delivery
  - **Long Term Goal:** Patient’s nutritional needs will be met
  - **Short Term Goal:** Prevent refeeding syndrome
Problem 1: Malnutrition related to inadequate oral intake, chronic debility as evidenced by emaciated appearance, muscle wasting, reported weight loss

- Intervention: Enteral Nutrition (ND-2.1)
  - Recommend Impact with Fiber with a goal rate of 45 ml/hr to provide 1310 kcal, 102 gm protein (ND-2.1.1).
  - Begin tube feeding at 15 ml/hr and advance 10 ml/hr each day until goal rate reached.

- Objective: Tube feeding will meet patient needs and refeeding syndrome will be prevented.
Problem 1: Malnutrition related to inadequate oral intake, chronic debility as evidenced by emaciated appearance, muscle wasting, reported weight loss

- Intervention: Vitamin and Mineral Supplements (ND-3.2)
  - Recommend 100mg thiamine supplement
  - Objective: Supplement will supply increased thiamine need due to refeeding syndrome.
Problem 2: Increased nutrient needs related to healing as evidenced by decubitus ulcer to buttock and healing PEG site.

- **Intervention:** Food and/or nutrient delivery
  - **Long-Term Goal:** Large decubitus ulcer and PEG site wound will heal completely.
  - **Short-Term Goal:** Wounds will not grow and begin to heal.
Problem 2: Increased nutrient needs related to healing as evidenced by decubitus ulcer to buttock and healing PEG site.

- **Intervention: Medical Food Supplements (ND-3.1)**
  - Recommend beneprotein to be given and glutamine supplementation to meet increased protein needs and assist with wound healing.
  - **Objective:** Protein stores will be replenished and wounds will properly heal.
Problem 2: Increased nutrient needs related to healing as evidenced by decubitus ulcer to buttock and healing PEG site.

- **Intervention:** Vitamin and mineral supplements (ND 3.2)
- **Recommend** multivitamin, zinc, and vitamin C supplementation
- **Objective:** Supplements will replenish deficiencies and improve wound healing
Problem 3: Inadequate oral intake related to respiratory failure as evidenced by mechanical ventilation.

- **Intervention:** Food and/or Nutrient Delivery
  - Long-Term Goal: Patient’s nutritional needs will be met
  - Short Term Goal: Patient will be able to receive nutrition
Problem 3: Inadequate oral intake related to respiratory failure as evidenced by mechanical ventilation.

- **Intervention: Enteral Nutrition**
  - Administer tube feeding to meet patient’s nutrition needs
    - **Objective:** Tube feed will provide greater than 75% of patient’s needs.
Nutrition Monitor and Evaluation

- Small bowel feeding tube was placed upon admit 1/23
- Tube feeding given along with additional vitamins and supplements
  - Tube feed was adjusted when SL’s needs not being met
- PEG replaced
- Nutrition related labs improved overall
- Wounds healing
Summary

- Nutrition care appropriate
  - Wt gain of 2 kg, not loss
    - BMI 20.2, 104% IBW
  - Labs improved with adequate feedings
  - Wound healing
  - New PEG tube
    - Improve future nutrition for SL