

Acute Leukemia Treated with Total Body Irradiation, Chemotherapy, and Bone Marrow Transplant

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KNH 406

Patient & Diagnosis

- Mrs. Rachel Dean- chemical engineer, married
 - Age: 25
 - Ht: 5'3" Admit Wt: 115 lb BMI: 20.3
 - Family history of CAD, not a smoker
 - Chief Complaint: chronic sinus congestion, symptoms unresponsive to antibiotics. Labs revealed elevated WBC and blasts.
 - Diagnosed with **acute myelogenous leukemia** (AML)
 - Chemotherapy introduced and 1st CR achieved
 - Appetite has been fair but decreased 2-3 days PTA due to anxiety
 - DX: Acute leukemia in CR. Admitted for bone marrow transplant
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Acute Myelogenous Leukemia (AML)

- A cancer of the blood and bone marrow
 - “Acute” denotes the disease’s rapid progression and its affect on immature cells rather than mature ones
 - Typically occurs in young people
 - Caused by damage to the DNA of developing cells in one’s bone marrow – cause mutation is unclear
 - Common Symptoms: flu like, fever, weight loss, bone pain, lethargy and fatigue, SOB, pale skin, frequent infections, easy bruising, unusual bleeding (nose and gums).
 - Diagnosed based on laboratory measurements and bone marrow biopsy
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Treatment Plan

- Preparative regimen: cyclophosphamide & total body irradiation.
 - Goal: Kill cancerous cells throughout body and bone marrow to make room for the new stem cells
 - Nutrition Related Side Effects: N/V, dehydration, diarrhea, mucositis, low immunity- increase energy and protein needs, electrolyte and fluid balance
 - Allogeneic bone marrow transplant
 - Increased need for energy and protein for recovery
 - Methotrexate for graft versus host disease (GVHD) prevention
 - GVHD: donor's cells attack patient's own body
 - Nutrition Related Side Effects: mucositis, lowered immune system, nitrogen catabolism, hypertension, hyperglycemia
 - Increase energy needs, monitor glucose levels and metabolic state
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Treatment Plan

- Cyclosporine for GVHD prevention until day +180
 - Nutrition Related Side Effects: hypomagnesemia, hyperkalemia, hyperglycemia, hyperlipidemia
 - Take labs regularly, monitor metabolic state, possible need for a higher dose of magnesium
- Prophylactic antifungal and antiviral infusions to prevent infection and development of GVHD
- Hematopoietic growth factors (GM-CSF)
 - less prone to infection, anemia, excessive bleeding
- Antibiotics given at onset of fever
- Pain managed by IV morphine



Overview of Hospital Stay

- Day +7: Severe mucositis, diarrhea (650 cc/day), weight dropped to 107lb
 - TPN - long recovery, tube feeding is not successful due to the severity of N/V, mucositis, delayed gastric emptying, and diarrhea.
 - Platelet count is extremely low- risk of bleeding during the placement of a feeding tube is increased
 - Energy: 30-35 Kcal/kg
 - Protein: 1.5 grams/kg
 - Nutritional implication: place on TPN, increased energy and protein, monitor patient to evaluate TPN tolerance
 - Day +11: mucositis improving, stool output decreased to 250-300 cc/day, N/V under control, still anorexic, unable to tolerate po
 - Nutritional implication: Continue TPN regime, monitor electrolyte and fluid balance
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Overview of Hospital Stay

- Day +16: developed a maculopapular rash on palms and trunk, bilirubin elevated (2.1mg/dL), stool output increased to 1200cc/24 hours -> diagnosed with stage I/II GVHD
 - Corticosteroid therapy begins immediately
 - Nutrition Related Side Effects: anorexia, weight loss, elevated energy and protein needs, hyperglycemia (usually require insulin), nitrogen catabolism, hypertension, and sodium retention.
 - Day +20: blood glucose averaging 350 mg/dL, sudden onset of hyperglycemia due to use of steroid therapy
 - Initiate an insulin regime: 1 unit for every 10g dextrose
 - Monitor sodium, potassium, fluids, etc. - patient to suffer looses diurnally.
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Patient's Progression:

- Responded well to corticosteroid therapy
 - stool output decreased to less than 150 cc/day
 - Bilirubin stabilized and rash diminished
 - Clear liquid diet (3 days)
 - GVHD diet -lactose free, residue/fiber free, low fat
 - Stage II GVHD diet- low lactose, low fiber
 - TPN weaned and discontinued by day +32
 - Follow diet until day +100
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Patient's Prognosis

- Recurrent leukemia is the chief cause of death among patients who received a transplant for leukemia
 - Long term effects of chemotherapy, TBI, transplant surgery, GVHD
 - Growth retardation, infertility, organ dysfunction, delayed gastric emptying, catabolism, osteoporosis, growth suppression, poor wound healing, Immunosuppression, infection
 - Take precautionary steps to prevent infection
 - Food safety is key!
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Questions?