MULTIPLE MYELOMA

Plasma Cell Disorders

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Relatively uncommon cancer
22,350 new cases expected in 2013
More common in men than women
10,710 deaths expected in 2013
5 year survival rate 42%
Survival rates are higher in younger people
Plasma cells produce immunoglobulins in the B-cell (humoral) immune system in response to antigens.

5 major immunoglobulin classes are: IgG, IgM, IgA, IgD, IgE (heavy chains)

Subunits of immunoglobulins:
Light chains (kappa and lambda)
The key to healthy plasma cells is that they are “polyclonal”

Malignancy happens when they become “monoclonal”
- They lose ability to make different copies of the cells and start making multiple copies that are all the same.
- Can usually be measured in bone marrow as well as serum and/or urine. Occasionally only found as soft tissue masses (plasmacytomas)
Malignant clonal proliferation of plasma cells

**MM** causes the oversecretion of one specific immunoglobulin known as the M protein (monoclonal protein)

- IgG and IgA more common

Slowly progressing disease

**Risk Factors:**

- Several chromosomal alterations are associated (deletions and translocations - (t(11;14) and t(4;14) most common)
- Exposure to nuclear radiation
- Seen more often in farmers, leather and wood workers and those exposed to petroleum products.
CRAB criteria

- Hypercalcemia
- Renal disease- creatinine >2.0 mg/dL or creatinine clearance < 40 mL/min
- Anemia- normochromic, normocytic anemia with hemoglobin <10
- Bone disease- lytic lesions, osteopenia, pathologic fractures
- Recurrent infections (>2 in 1 year)
- Greater than 10% plasma cells in the bone marrow

HYPERCALCEMIA

- Most common oncologic emergency
- Seen in up to 30% of MM patients
- Elevated due to bone destruction
- Bisphosphonates prevent the loss of bone mass

Notes on Nursing Care:
Monitor for side effects related to bisphosphonates
ONJ - Osteonecrosis of the jaw
Increase mobility/exercise to help maintain bone mass
BONE PAIN OR FRACTURES

- Unexplained pain
- Osteolytic lesions
- Fractures (ribs, femur, clavicle most common)
- Compression fractures of the spine

Notes on Nursing Care:
- Pain management
- Monitoring bone health - scans
- Monitor for potential fractures
- Assess for signs of cord compression - sensory and motor loss
**RENAL FAILURE**

- Light chain and heavy chain immunoglobulins precipitate and cause damage to renal cells and renal tubules
- Hypercalcemia

**Notes on Nursing Care:**
- Maintain hydration to avoid renal failure
- Avoid use of NSAIDs
- Avoid IV contrast
- Monitor for renal dysfunction with chronic use of bisphosphonates
**Susceptibility to Infection**

- Decreased immunoglobulins fighting infection
- Crowding out of normal WBCs from clonal plasma cells in marrow (also causes anemia)

**Notes on Nursing Care:**
Monitor for fever
Assess for sites of infection
Neutropenic precautions
Avoid crowds and ill friends and family
Patient education

www.steadyhealth.com
CLOTTING DISORDERS

- Interference with clotting factors
- Platelet dysfunction

Notes on Nursing Care:
Assess for signs of bleeding
Monitor for neuro/cerebellar changes
Transfuse for plts <20
Patient education
NEUROLOGIC SYMPTOMS

- Nerve compression
- Hyperviscosity may cause CNS changes (visual, HA)
- Confusion related to Hypercalcemia
- Therapy related toxicity

Notes on Nursing Care:
Monitor for neuro/cerebellar changes
Assess for orientation
Muscle weakness
Sensory loss
Safety concerns
Hyperviscosity

- Increased monoclonal protein coats RBCs and makes them sticky
- Impairs circulation
- Peripheral neuropathies
- Organ damage
- Amyloidosis - clumping of proteins sitting in organs - causes organ dysfunction

Notes on Nursing Care:
Assess for infection/bleeding
Monitor for neuro/cerebellar changes
Transfuse for hgb<7 and plt<20
Patient education
Emotional support
# STAGING OF MULTIPLE MYELOMA

<table>
<thead>
<tr>
<th>International Staging System</th>
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<tbody>
<tr>
<td><strong>Stage I</strong></td>
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<td>Stage II</td>
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<tr>
<td>Stage III:</td>
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**Beta-2 microglobulin** - non-specific tumor marker that indicates an increase in tumor burden in patients diagnosed with Multiple Myeloma. Decreasing levels may indicate a response to treatment.
Disease may be slowly progressing for years and not require treatment.

Varying combinations are used when symptoms present

**First Line Drugs**
- Thalidomide
- Dexamethasone

**Second Line Drugs**
- Lenalidomide
- Velcade

**VDT PACE**
- Velcade, Dexamethasone, Thalidomide, cisPlatinum, Adriamycin, Cytoxan and Etoposide
Mr. K is a 59-year-old gentleman with IgG kappa multiple myeloma, here for evaluation prior to autologous transplant. Mr. Keller was diagnosed in May 2011. At that time his M-protein was 3.6, he had an 85% plasma cells in his bone marrow, anemia, normal creatinine, normal calcium, no clear evidence of lytic lesions. Urine protein electrophoresis in July 2011 was negative, although small quantities of Bence-Jones protein could be identified in the BJP test. He had normal cytogenetic with (11;14) translocation on FISH. Overall, he seems to have a stage I or II at diagnosis.
REFERENCES

- http://www.cancer.org/research/cancerfactsfigures/index