Treatment of Pediatric Germ Cell Tumors of the Ovary

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Disclosure Information

No Disclosures

Objectives

1. Participants will be able to describe the 4 staging categories of ovarian germ cell tumors.
2. Participants will be able to identify 3 chemotherapeutic agents in the treatment of ovarian germ cell tumors.
3. Participants will be able to recognize at least 3 side effects and special considerations of chemotherapeutic agents used in the treatment of ovarian germ cell tumors.
Ovarian Germ Cell Tumors Overview

- Ovarian germ cell tumors (OGCT) are neoplasms usually composed of tissue from 2 or 3 germ cell layers:
  - Ectoderm
  - Mesoderm
  - Endoderm
- Grade is based on proportion of tissue containing immature neural elements.
- Immature cystic teratoma affects younger patients and is less common than mature cystic teratomas.
- Immature cystic teratoma is distinguished by presence of embryonic tissues. They are typically larger (14 to 25 cm) and have prominent solid components.

Ovarian Germ Cell Tumor (OGCT) Staging System

- Stage I - Limited to the ovary (ovaries) or fallopian tubes. No spread to nearby lymph nodes or distant sites.
- Stage II – Present in one or both ovaries or fallopian tubes and has spread to other organs within the pelvis or peritoneum. No spread to nearby lymph nodes or distant sites.
- Stage III – Present in one or both ovaries or fallopian tubes, or there is a primary peritoneal tumor and may have spread into nearby organs in the pelvis. Spread to the retroperitoneal lymph nodes only. Not spread to distant sites.
- Stage IV – Tumor cells spread to the liver, spleen, lymph nodes and/or organs or tissues outside the peritoneal cavity such as the lungs and bones.

Treatment Protocols for Pediatric Germ Cell Tumors

- Children’s Oncology Group Protocol AGC01P1 – Treatment of high risk malignant germ cell tumors
  - Bleomycin, Etoposide, Cisplatin with escalating doses of Cyclophosphamide (C-BEP)

- Children’s Oncology Group Protocol AGCT0521 – Treatment of recurrent or resistant pediatric malignant germ cell tumors
  - Paclitaxel, Ifosfamide, and Carboplatin
### Bleomycin Sulfate (Blenoxane®)

**Therapeutic Category**
- Antineoplastic Agent, Antibiotic

**Indications**
- Germ cell tumors
- Hodgkin’s disease

**Route:** IV given Day 1 over 10 minutes (Week 1, 4, 7, 10)

**Side Effects**
- **Common**
  - Stomatitis
  - Alopecia
  - Hyperpigmentation of fingernails
- **Occasional**
  - High fever

**Special considerations**
- A test dose may be given to observe for allergic/anaphylaxis reactions.
- Lower dose may need to be given when pulmonary radiotherapy is used in the treatment protocol.
- Pulmonary function tests are done as baseline, throughout the course of therapy and for a period of time after therapy; patients can develop fibrosis, with decreased diffusion capacity at any time during and after therapy.

**Nursing considerations**
- Oncologist may order test dose; wait 1 hour after test dose and give remaining dose. Have emergency equipment/medications available during test dose.
- Monitor pulmonary function tests as specified by protocol and as needed if clinical condition changes.
- If respiratory abnormalities occur, monitor patient with pulse oximetry (resting and with exercise).
- Long term: patients should be told to avoid scuba diving and to avoid 100% oxygen if possible. Additionally, if patient needs a surgical procedure with general anesthesia the anesthesiologist needs to be aware patient was treated with Bleomycin.

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### Cisplatin (Platinol®)

**Therapeutic Category:**
- Antineoplastic Agent, Alkylating Agent; Platinum Analog

**Indications**
- CNS tumors
- Neuroblastoma
- Osteosarcoma

**Route:** IV given on Day 1-5 over 1 hr (> 12 months) or over 4 hours (< 12 months)

**Side Effects**
- **Common**
  - Nausea, vomiting (often delayed)
  - Anorexia
  - Myelosuppression
  - Hypomagnesemia
  - High frequency hearing loss
- **Occasional**
  - Hearing loss
  - Electrolyte disturbances
- **Rare**
  - Anaphylaxis

**Special considerations**
- Synergistic with radiation therapy.
- Aluminum reacts with cisplatin, causing precipitate formation and loss of potency; therefore, do not allow needles or IV sets containing aluminum parts to come in contact with drug.
- Intensifies aminoglycoside toxicity and should be used with caution when administered concurrently.
Cisplatin (Platinol®)

Nursing considerations
- Anti-emetics should be around the clock
- Remember delayed N/V (anti-emetics for discharge needs)
- Strict I/O with good urine output
- Diuretics if necessary
- Assess kidney function and electrolytes
- Magnesium supplements to prevent hypomagnesemia
- Audiograms

Cyclophosphamide (Cytoxan®)

Therapeutic Category
- Antineoplastic Agent, Alkylating Agent (Nitrogen Mustard), Antirheumatic Agent, Immunosuppressant Agent

Route:
- IV given on Day 1 over 1 hour (Week 1,4,7,10)

Indications
- ALL
- Rhabdomyosarcoma
- CNS tumors
- Neuroblastoma
- Lymphoma
- Bone tumors

Side effects
Common
- Anorexia
- Nausea, vomiting
- Myelosuppression
- Alopecia
- Gonadal dysfunction/sterility

Occasional
- Hemorrhagic cystitis
- SIADH

Special considerations
- Administration of high doses of cyclophosphamide should have adequate pre-hydration and post-hydration.
- Mesna a bladder protectant (false + ketones in urine)
- WBC nadir between 9–15 days (recovery by 21 days).

Nursing considerations
- Maintain adequate hydration (important pre and post Cyclophosphamide)
- Strict I/O
- Frequent urination
- Check urine for blood and specific gravity
- Administer early in the day when possible
- May be given with or without meals
- Delayed nausea and vomiting
Etoposide (VePesid®)

Therapeutic Category:
Antineoplastic Agent, Mitotic Inhibitor; Topoisomerase Inhibitor

Indications
• Lymphoma
• Bone tumors
• AML
• CNS tumors

Route: IV given on Day 1-5 over 1 hour (Week 1, 4, 7, 10)

Side effects
Common
• Nausea, vomiting
• Myelosuppression

Rare
• Hypotension
• Anaphylaxis

Special considerations
• Severe hypotension can occur with rapid infusion
• Concentrations above 0.4 mg/mL have unpredictable stability in solution
• Not to be refrigerated
• IV dosing can crack plastic

Nursing considerations
• Monitor BP frequently during administration.
• Have emergency equipment/medications available.
• Watch IV tubing for cracks.
• Monitor IV bag/tubing for precipitates.
• Currently on national shortage (FDA Drug shortages Jan 2018, Partial availability expected March 5, 2018)

References
References


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