Cognitive Function and Ovarian Cancer

Erin G. Holker, Ph.D., ABPP
“Chemobrain”

- A controversial term, originated when women treated for breast cancer noticed mental fogginess

- Not specific to the effects of chemotherapy – there may be many contributing factors to changes in thinking in people treated for cancer
Factors which may contribute

• Treatment
  – Surgery
  – Radiation
  – Chemotherapy: certain chemotherapeutic agents are especially neurotoxic, such as methotrexate
  – Immunotherapy
Factors which may contribute

• Adjunctive medications
  – **Corticosteroids**: have adverse effects on mental and emotional functioning, such as anxiety, depression, mania, insomnia, restlessness, increased motor activity, and cognitive problems; tend to resolve when steroids are discontinued
  – **Antiepileptic medications**: sedation, distractibility, processing speed, memory, sleepiness, dizziness
Factors which may contribute

- Adjunctive medications
  - immunosuppressive agents, opioids, hypnotics, antiemetics

- Other contributors:
  - fatigue, depression, stress, anxiety, sleep disturbance, anemia
Factors which may contribute

- Some studies show that there is an increased risk of cognitive dysfunction in women who underwent surgically-induced menopause, although this finding has not been consistent across studies
Additional Factors

• Some studies show cognitive decline in cancer patients *before* treatment

  – Surgery and anesthesia, pre-existing cognitive conditions, genetic predispositions, or other cancer-related issues could contribute
Some have suggested “cancer- or cancer-therapy-associated cognitive change” as a more appropriate name, since the changes are not all attributable to chemotherapy.
Common Cognitive Concerns

• Memory changes, including trouble remembering details like names or telephone numbers

• Difficulty with concentration

• Difficulty with multitasking
Common Cognitive Concerns

• Slowed processing speed
• Word finding problems

• These cognitive complaints correlate more with depression and anxiety than with formal cognitive testing
Cognitive symptoms

• Memory impairment: problems retrieving information, rather than retaining it
• Problems with executive functioning: decision making, planning, organization, problem solving
• Attention
• Processing speed
Cognitive symptoms

- There are not a lot of studies that look at the effect of cognitive symptoms on everyday life.
- Overall, the cognitive symptoms are likely to be subtle and affect only a subset of people treated for cancer.
Cognition in survivors of ovarian cancer

• Only a few studies have been done
• Mayerhofer et al., 2000
  – Motor skills and attention in patients prior to receiving chemotherapy, after three cycles of treatment, and at the end of chemotherapy
    • At baseline, 82% had abnormal motor skills and reported increased anxiety; 25% had impaired attention
    • There was no decline during or after chemotherapy, and a mild improvement in attention (maybe related to practice)
Cognition in survivors of ovarian cancer

• Kudelka at al (1998) examined the impact of a novel chemotherapy agent on cognitive functioning at each cycle of therapy
  – 4/16 patients had a transient decline in memory and motor speed and dexterity after each treatment cycle
Cognition in survivors of ovarian cancer

  - Attention, motor speed and cognitive flexibility remained stable or slightly improved during the study period
  - Highly educated women reported a decline in cognition and emotional well-being during chemotherapy with improvement after six months; this was not correlated with cognitive test performance
Cognition in survivors of ovarian cancer

- Correa et al (2010) looked at cognition in long-term survivors of ovarian cancer who were either in complete remission or had recurrent disease, 5 to 10 years after diagnosis
  - No significant difference between groups on attention, memory, or executive functioning, and mean scores were in the average range range
  - Nonetheless, 28% met criteria for cognitive impairment on at least one test (compared to 15% of healthy women); women with recurrent disease were slightly more likely to have a cognitive impairment
Why are there changes?

• The mechanism is not entirely clear but possibilities include:
  – Demyelination
  – Secondary inflammatory response
  – Microvascular injury
• Chemotherapy may cross the blood brain barrier
• Genetics
Risk Factors

- Central nervous system (CNS) cancers (e.g., brain tumors)
- CNS treatments (cranial radiation, IT chemotherapies, brain surgery)
- Diagnosis and treatment at a young age
- Tumors involving eye or ear; Treatments affecting vision and hearing (e.g., cisplatin)
- Certain chemotherapy agents (i.e., methotrexate)
Strategies for Intervention

• Neuropsychological evaluation: formally assesses memory, processing speed, attention, problem solving, and other aspects of cognition

• When cognitive problems are found on testing, your doctors will need to rule out reversible causes, like endocrine or metabolic dysfunction, anemia, or fatigue, and treat these if necessary

• Since emotional distress can exacerbate cognitive problems, medications and/or cognitive-behavioral psychotherapy may be recommended
Strategies for Intervention

• There are some stimulant medications which may be beneficial in the treatment of attention difficulties, processing speed deficits, and fatigue.
• Cognitive rehabilitation may be helpful
  – Focus on compensatory strategies, such as note-taking, keeping a calendar, etc., and are tailored to each individual.
Strategies for Intervention

- Adjust the home and/or work environment to minimize problems with attention and distractibility
  - Provide good lighting
  - Reduce visual and auditory distractions like televisions, music, telephones, etc.
  - Take frequent breaks
  - Take advantage of “up” times to maximize efficiency and accuracy