

Cognitive Function and Ovarian Cancer

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“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 et 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

- Hensley et al (2006) looked at cognition and quality of life in patients with advanced ovarian, peritoneal, or fallopian tube cancer treated with paclitaxel, gemcitabine, and carboplatin
 - 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
 - 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