Nervous System Side Effects

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Nervous system side effects are common from cancer and cancer treatments. The nervous system is made up of the central nervous system (CNS) and the peripheral nervous system (PNS). The CNS is made up of the brain and spinal cord. The PNS is made up of the nerves outside of the CNS that carry information back and forth between the body and the brain. The PNS is involved in movement, sensing (touching, hearing, seeing, tasting, and smelling), and the functioning of the internal organs, (for example, the stomach, lungs, and heart).

Types of nervous system side effects

Some of the nervous system side effects that may be caused by cancer or cancer treatment include the following:

- Hearing loss and/or tinnitus (ringing in the ears)
- Vision loss and/or vision side effects (such as blurred or double vision)
- Speech difficulties, such as slurred speech, difficulty expressing oneself or understanding speech
- Cognitive (thought process) changes including decreased memory, problem solving, and calculation
- Changes in taste [2] and smell
- Difficulty swallowing [3]
- Problems with balance, dizziness, vertigo (feeling like the room is spinning), and nausea
- Ataxia (problems with coordination) and movement, including problems with posture, walking, or holding objects
- Asthenia, a general weakness that causes an overall lack of strength; hemiparesis (weakness on one side of the body); drowsiness
- Paralysis of different parts of the body, ranging from hemiplegia (paralysis of one side of the body) to paralysis of a smaller area, such as the muscles in the face
- Seizures
- Changes in the functioning of organs, which can cause constipation, incontinence (inability to control the flow of urine), and impotence (an inability to get or maintain an erection)
- Pain [4], which can be caused by a tumor pressing on the nerves or damage to the nerves from treatment
- Peripheral neuropathy [5], a condition caused by damage or irritation to the peripheral nerves. The symptoms may include numbness, tingling ("pins and needles"), or burning pain in the arms, hands, legs, or feet; decreased ability to sense hot and cold; difficulty lifting the feet or toes; difficulty picking up small objects; decreased muscle strength; vision or hearing changes; and/or constipation

Causes

Nervous system side effects are caused by many factors, including cancer, cancer treatments, other medications, or other disorders. The symptoms may lead to a cancer diagnosis, appear soon after treatment, or may appear several years after treatment. The possible causes of nervous system problems are listed below:

- Cancers that affect the nervous system, such as brain cancer and sarcomas of the nerves (for example, neurofibrosarcoma, malignant peripheral nerve sheath tumor, and peripheral primitive neuroectodermal tumor all affect the nervous system)
- Cancers that have metastasized (spread) to the brain or spinal cord
- Tumors growing in other parts of the body that press on nerves
- Some types of chemotherapy [6] may cause peripheral neuropathy, such as bortezomib (Velcade), carboplatin (Paraplatin), cisplatin (Platinol), docetaxel (Docefrez, Taxotere), oxaliplatin (Eloxatin), paclitaxel (Taxol), thalidomide (Synovir, Thalomid), vinblastine (Velban, Velsar) and vincristine (Oncovin, Vincasar).
- Other types of chemotherapy may cause other nervous system side effects. These types include cytarabine (Cytosar-U), fluorouracil (5-FU, Adrucil), ifosfamide (Ifex), interferon (multiple brand names), fludarabine (Fludara, Oforta), and methotrexate (multiple brand names).
- Radiation therapy [7], especially to the head and neck, or whole-body radiation treatment
- Radiation therapy to the spine, or chemotherapy injected directly into the spine
- Surgery [8], if nerves are damaged during surgery to remove a tumor or to perform a biopsy [9] (removal of a small amount of tissue for examination under a microscope)
- Specific medications, including some antinausea drugs, opioid (strong) pain killers, and anticonvulsants (drugs to treat seizures)
- Infections [10] causing swelling or inflammation of the brain, spinal cord, or inner ear
- Other conditions or symptoms related to cancer or cancer treatments, including anemia [11] (low number of red blood cells), dehydration [12]

, fatigue [13], stress [14], and depression [15]
- Other conditions or disorders not related to cancer, such as diabetes, vitamin deficiency, thyroid dysfunction, human immunodeficiency virus (HIV), stroke, Alzheimer?s disease, multiple sclerosis, and nerve injury

Management

Relieving side effects?also called symptom management, palliative care [16], or supportive care?is an important part of cancer care and treatment. Talk with your health care team about any symptoms you experience, including any new symptoms or a change in symptoms.

Nervous system side effects can make it difficult for people to complete their usual daily activities. Some symptoms caused by cancer treatment will go away after treatment ends, but some may be ongoing. Although nerve damage and nervous system side effects may not be preventable, most are manageable if found early. Early treatment can also prevent the symptoms from worsening. It is important to tell your doctor immediately if you have any of the symptoms listed above. Once diagnosed, management of nervous system side effects depends on the type of problem and the cause. The following list provides several ways to manage nervous system problems:

- Antinausea and antivertigo medications, such as meclizine (Antivert), prochlorperazine (Compazine, Compro), scopolamine patch (Transderm-Scop),
- Antibiotics (to treat infection), and corticosteroids (to reduce inflammation and swelling)
- Pain medications [17], including opioids, as well as tricyclic antidepressants such as amitriptyline (multiple brand names), nortriptyline (Aventyl, Pamelor), anticonvulsants, including gabapentin (Neurontin), and pregabalin (Lyrica) used to treat peripheral neuropathy and other types of nerve pain (called neuropathic pain)
- Nerve blocks and transcutaneous electric nerve stimulation (TENS), which provide pain relief
- Occupational therapy, to maintain motor skills needed for daily activities, such as getting dressed, picking up small objects, writing, or doing household chores
- Physical therapy, to improve physical strength, balance, coordination, and mobility
- Speech therapy, to improve speech and learn ways to change speech as needed
- Evaluation by a neuropsychologist to look at cognitive function
- Changes to the home environment to increase safety, such as installing hand rails in the bathroom, using nonskid rugs, adding extra lighting, and checking water temperature with an elbow instead of the hands

More Information

Rehabilitation [18]

Cognitive Problems [19]

[19]Managing Side Effects [20]

Links:
[1] http://www.cancer.net/about-us
[2] http://www.cancer.net/node/25060
[3] http://www.cancer.net/node/25046
[4] http://www.cancer.net/node/25259
[5] http://www.cancer.net/node/24588
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