GRAPHOLOGICAL ANALYSIS: A POTENTIAL PSYCHODIAGNOSTIC INVESTIGATIVE METHOD FOR NEUROTOXICITY DETECTION OF CHEMOTHERAPY IN CANCER PATIENTS

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ABSTRACT

Neurotoxicity may occur as a result of exposure to neurotoxins, is reversible, and can be detected by specialized management of the cancer patient. Neurotoxicity can be chronic when the nervous system is exposed to lower doses of neurotoxins, but for a long time, but can also be acute, when exposure has occurred to high concentrations of toxic substances. The development of a methodology aimed at optimizing the management of the patient with chemotherapy in the field of hematological malignancies, would allow the early detection of neurotoxic manifestations such as neuromotor problems (uncoordinated movements, limb tremor), cognitive impairment. Handwriting analysis may help identify neurotoxicity before other symptoms and clinical signs occur.

Graphological features define script attributes like layout configuration, letter size, shape, slant and skew angle of lines, etc. A graphological analysis requires a complex interpretation process. The research paper contains a critical analysis of handwritten texts, presents a model that links features from handwritten images. After the extraction, data were classified using a neural network.

An experimental framework with real samples has been constructed to illustrate the performance of the approach.

The research paper contains a critical analysis of the graphological approach. Patients who manifest neurotoxicity develop neurocognitive deficits that are consistent with frontal network systems dysfunction including executive dysfunction, reduced learning and memory, impaired fine motor dexterity. Early detection of toxicity may allow early intervention.

Dysbiosis (malfunction of the microbiome) can promote the development of neurotoxicity. The microbiome's protective function could be used in the future.

BACKGROUND

Neurotoxicity may occur as a result of exposure to neurotoxins, is reversible, and can be detected by specialized management of the cancer patient. Neurotoxicity can be chronic when the nervous system is exposed to lower doses of neurotoxins, but for a long time, but can also be acute, when exposure has occurred to high concentrations of toxic substances. Roughly 60% of patients undergoing chemotherapy have some associated neurotoxicity. Early detection and intervention are vital.

Neurotoxicity associated with chemotherapy is recognized more often today than ever before. It's estimated that 60% of patients receiving neurotoxic chemotherapeutic agents have some degree of associated neurotoxicity. Neurotoxicity affects the patient not only physically, but also functionally, psychosocially, and spiritually, and in turn can affect the family as well. Chemotherapy-induced neurotoxicity is a significant complication in the successful treatment of many cancers. Damage to the nervous system may result from the direct or indirect effects of neurotoxic chemotherapeutic agents on the central nervous system, peripheral nervous system, cranial nerves, or a combination of these. Neurotoxicities are usually temporary and resolve when the treatment is stopped.

OBJECTIVES

The development of a methodology aimed at optimizing the management of the patient with chemotherapy in the field of hematological malignancies, would allow the early detection of neurotoxic manifestations such as neuromotor problems (uncoordinated movements, limb tremor), cognitive impairment.

Handwriting analysis may help identify neurotoxicity before other symptoms and clinical signs occur. Graphological features define script attributes like layout configuration, letter size, shape, slant and skew angle of lines, etc.

MATERIALS AND METHODS

A graphological analysis requires a complex interpretation process

RESULTS

Chemotherapy may have detrimental effects on either the central or peripheral nervous system. Patients report problems with memory retrieval, learning, and concentration, which may persist after treatment has finished or never fully resolve. Neurotoxicity of Chemotherapy. Cross-sectional studies also suggest persistent cognitive dysfunction in 20% to 30% of patients 2 to 10 years posttreatment.

Mechanisms for this functional decline are not fully understood. Neurotoxicity refers to the direct or indirect effect of chemicals that disrupt the nervous system of humans or animals. Neurotoxicity is usually self-limiting after exposure ceases and rarely progressive in the absence of continued exposure, although there may be a significant delay between exposure and manifestation of neurotoxic effects.

Neurological side effects are a common complication following chemotherapy and can adversely affect clinical management of the cancer patient. Cancer patients during chemotherapy report problems with memory retrieval, learning, and concentration, which may persist after treatment has finished or never fully resolve. Peripheral neuropathies are the most common neurological complications in patients receiving chemotherapy, especially with regimens containing taxanes, platinum, and vinca alkaloids.

DISCUSSION

Neurological side effects are a common complication following chemotherapy, and can adversely affect clinical management of the cancer patient. The overall incidence of these toxicities is unknown, but they are becoming more common. Additionally, as more patients survive long term, late neurological side effects are becoming increasingly recognized, such as impaired cognitive function.

Cancer patients have frequently recognized decreased cognitive function ("chemo-brain") during chemotherapy, which, in the past, was attributed by their physicians to stress or depression.

A thorough neurologic assessment during the first visit and subsequent visits will ensure quick identification of chemotherapy-induced neurotoxicities.

The clinician should assess for changes in mental status and vision, ability to walk, hallucinations, numbness and tingling in extremities, constipation, urinary retention, hearing loss, myalgia, arthralgia, weakness, hemiparesis, and hemiplegia. Nurses play an important role in the early detection of and intervention for neurotoxicity, the success of treatment, and the patient's quality of life both during and after treatment.

CONCLUSION

The research paper contains a critical analysis of the graphological approach.

Patients who manifest neurotoxicity develop neurocognitive deficits that are consistent with frontal network systems dysfunction including executive dysfunction, reduced learning and memory, impaired fine motor dexterity.

Early detection of toxicity may allow early intervention. Dysbiosis (malfunction of the microbiome) can promote the development of neurotoxicity. The microbiome's protective function could be used in the future.

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