

Ozone Therapy and Acupuncture Application in the Treatment of Neuropathy Due to Chemotherapeutics used in Cancer Treatment

Hayriye Alp

Necmettin Erbakan University, GETAT CENTER, Konya, Turkey.

Corresponding Author: Hayriye Alp, Necmettin Erbakan University, GETAT CENTER, Konya, Turkey.

Received date: September 30, 2021; **Accepted date:** October 10, 2021; **Published date:** October 26, 2021

Citation: Hayriye Alp (2021) Ozone Therapy and Acupuncture Application in the Treatment of Neuropathy Due to Chemotherapeutics used in Cancer Treatment. *J. Clinical Cancer and Oncology Research*. 1(3) DOI: [10.31579/CCOR-2021/019](https://doi.org/10.31579/CCOR-2021/019)

Copyright:©2021, Hayriye Alp, This is an open access article distributed under the Creative Commons Attribution License, which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited.

Abstract

Peripheral nervous system, vascular barrier and lymph It is susceptible to accumulation of neurotoxin due to lack of drainage with chemotherapeutic exposure long axons and myelinated fibers, decreased sensory nerve conduction velocity and intraepidermal nerve fiber loss. Due to the use of chemotherapy drugs One of the important side effects developing is peripheral neuropathy. Chemotherapy-induced peripheral neuropathy (CIPN) is a common and dose-limiting disorder resulting from the administration of neurotoxic chemotherapeutic agents. In this study, we tried to investigate the effectiveness of acupuncture and ozone therapy on neuropathy.

Method: Patients who applied to Getat Polk, received cancer chemotherapy and had neuropathy complaints were included. Those who are allergic to broad bean, citrus, pregnant and antiaggregant users were excluded. In addition to 10 sessions of body and ear acupuncture, bagging ozone therapy was taken. DU-20,21, H-9,LU-7,P-6,GB-34,ST-36,KID-3-6,Shenmen,zero, Hand and foot points were pricked with disposable acupuncture needles(13x20mm Huolong). Hands and feet were placed in an ozone therapy resistant bag, and sessions were held for 20 minutes, starting from 20 gamma to 50 gamma($\mu\text{g/ml}$).

Result: Total 7 patient included. 10 session Acupuncture and 5 session ozone therapy made.

Ozone therapy and acupuncture applications can be added to the treatment in patients who are suitable for neuropathy complaints after cancer treatment and satisfactory results can be obtained.

Key words: neuropathy; acupuncture; ozone therapy

Introduction

Peripheral nervous system, vascular barrier and lymph It is susceptible to accumulation of neurotoxin due to lack of drainage. with chemotherapeutic exposure long axons and myelinated fibers, decreased sensory nerve conduction velocity and intraepidermal nerve fiber loss. Peripheral nerve degeneration or progressive intraepidermal nerve fiber loss is the main neuropathology of CIPN.

Due to the use of chemotherapy drugs one of the important side effects developing is peripheral neuropathy. Chemotherapy-induced peripheral neuropathy (CIPN) is a common and dose-limiting disorder resulting from the administration of neurotoxic chemotherapeutic agents is a side effect (Argyroui 2012, Baron 2006). Treatment with platinum analogues, vinca alkaloids, taxanes, ifosfamide and methotrexate it is stated that CIPN is more common in patients with CIPN is frequently seen in 30-40% of patients and its degree varies from patient to patient. Causes a decrease in quality of life (Bhandari 2016, Beijers 2012). In chemotherapy-induced neuropathy, both motor and Sensory fibers may

also be involved. Sensory neuropathy it usually causes complaints of "sock and glove" sensation in the extremities of the patient [2].

Symptoms of CIPN include paresthesia and dysesthesia in peripheral extremities, numbness, ataxia, tingling, burning, decreased sense of touch, deep tendon reflex decrease and movement and sometimes pain [1].

In KIPN, cold Losses of A δ (specific cooling) and C fibers (temperature specific) from nociceptors are also observed, causing allodynia. In general, the structural degree of damage, type of anti-cancer drugs and dosage varies depending on the regimen [6].

In this study, we tried to investigate the effectiveness of acupuncture and ozone therapy on neuropathy.

Method

Patients who applied to Getat Polk, received cancer chemotherapy and had neuropathy complaints were included. Those who are allergic to broad bean, citrus, pregnant and antiaggregant users were excluded.

Result

Case 1

A 15-year-old female patient, 165 cm, 64 kg, presented with the complaint of numbness and tingling in the hands and feet, and balance disorder in walking. Her blood pressure was 120/80mmHg. He stated that his complaints were in the form of tingling and then spasms about 1.5 months ago after chemotherapy. In 2020, he had adenoid operations due to ovarian ca, in 2013, and trigger finger operations in 2006-2006. He was using neurontin 300mg. His VAS was 6-7.

In addition to 10 sessions of body and ear acupuncture, bagging ozone therapy was taken. DU-20,21, H-9,LU-7,P-6,GB-34,ST-36,KID-3-6,Shen-men,zero, Hand and foot points were pricked with disposable acupuncture needles(13x20mm Huolong). Hands and feet were placed in an ozone therapy resistant bag, and sessions were held for 20 minutes, starting from 20 gamma to 50 gamma($\mu\text{g/ml}$).

In the 3rd session, the gait and balance problem decreased. At the end of the treatment, the VAS was 2.

Case 2

A 58-year-old female patient, 67kg, 160cm, applied to polk with leg pain due to previous uterine ca. blood pressure 110/770mmHg,

He had a history of cesarean section in 1985, hysterectomy in 2017, and cataract operations in 2019. He also had lymphedema and stomach complaints. 10 sessions of both acupuncture and major ozone therapy were applied to the patient. The patient was relieved in the 5th session.

Case 3

A 43-year-old female patient, 90kg, 168cm, had previous breast ca operation. 10 sessions to strengthen pain and immunity major ozone therapy was applied. Starting from 10 gamma up to 50 gamma, ozone IV was applied. The patient started to relax in the 3rd session.

Case 4

16 years old female, 63kg,160cm. her history thyroid caand diabetes.glukose 128mg/dl, HbA1c 6,1%, anti tyhroid anticor 30,22u/ml.TSH 0,5Mu7l,TgAB 15U/ml.insuline 17,3Mu/l. 10 sessions to strengthen pain and immunity major ozone therapy was applied. Starting from 10 gamma up to 50 gamma, ozone IV was applied. The patient started to relax in the 3rd session.

Case 5

A 51-year-old female patient applied to polk with hip pain after surgery uterine ca. VAS 7-8. She had anemia, HBV carrier in my history, total abdominal hysterectomy in 2017 and ankylosing spondylitis for 15 years. She was using plaquinil colcicum and aspirin 100mg.

blood sugar was 103, total cholesterol 201, Na 147, F 4.91, phosphorus 3.6, calcium 9.09, magnesium 2.08, LDH 263, B12 422, TSH 0.9, CRP 7.3, Ferritin 467, hemoglobin 9.4 mg/dl .

In the treatment, besides 10 sessions of acupuncture, ferrosanol duodenal and B vitamin replacement were added. The patient was VAS 3 in the 6th session.

Case 6

A 31-year-old female patient had been operated for lung and thymoma ca 4 years ago. He applied to polk due to neuropathic pain and insulin resistance. He had a history of cerebral hemorrhage 7 years ago and 2 strokes in his history. glukose 85, Na 142, K 4.5, calcium 9.78, total cholesterol 267, d vit 22.43, GGT 59U/L

The patient received 10 sessions of acupuncture, and at the end of 8 sessions of treatment, the VAS value due to neuropathic pain decreased to 2.

Case 7

40 years old male, 176cm,77kg. VAS 6. In his history insomnia and neuropathic pain.albumin 4.3, glukose 93, hb 15mg/dl, sgot 22, sgpt 19. Acupuncture and ozone therapy made.after therapy VAS 3.Insomnia is absent.

Discussion

Traditional Chinese Acupuncture has a history of about 3000 years. Acupuncture is applied to the skin and subcutaneous muscle tissue with acupuncture needles such as steel, silver and gold to the acupuncture point. By inserting the acupuncture needle into the skin, the skin and subcutaneous muscle tissue are affected by all kinds of stimuli. Thus, it causes the release of endogenous opioids, which are known to have a role in pain control, by stimulating pain receptors, that is, free nerve endings. When the pain control system is activated, neurons originating from the mesencephalon, periaqueductal gray matter and periventricular region send their impulses to the raphe magnus nucleus and nucleus reticularis paragigantocellularis. From here, the impulses descend into the dorsal column of the spinal cord and the pain-inhibitory complex located in the dorsal horn of the spinal cord. Considering this metabolism on a large scale, it is thought that acupuncture has a great effect in the treatment of pain.

In humans [7]. and rats [8], it was determined that stimulation of the muscle under the acupuncture point with a low-frequency current with a force that can cause contraction produced acupuncture analgesia, while it was observed that the current with the same characteristics applied to a point without an acupuncture point did not cause analgesia. The occurrence of analgesia as a result of stimulation of the acupuncture point was related to inhibition of neural activity in the dorsal periaqueductal gray area and brainstem reticular formation, and it was observed that acupuncture analgesia lost its effect with hypophysectomy and application of betaendorphin antiserum into the third ventricle [9].

studies show that electroacupuncture activates the nervous system differently in health than in pain conditions, alleviates both sensory and affective inflammatory pain, and inhibits inflammatory and neuropathic pain more effectively at 2 to 10 Hz than at 100 Hz. Electroacupuncture blocks pain by activating a variety of bioactive chemicals through peripheral, spinal, and supraspinal mechanisms. These include opioids, which desensitize peripheral nociceptors and reduce proinflammatory cytokines peripherally and in the spinal cord, and serotonin and norepinephrine, which decrease spinal N-methyl-D-aspartate receptor subunit GluN1 phosphorylation [10].

Chronic pain secondary to treatment in cancer survivors without tumor evidence is not unusual. Its management often requires specific approaches that are different from those applied for cancer patients with advanced disease and short life expectancy. Some studies have described clinical benefit with ozone therapy (O_3T) in the management of pain and side effects secondary to cancer treatment.in other study all cases, except one, showed clinically relevant pain improvement. Visual analog scale score with the standard treatment was 7.8 ± 2.1 before O_3T , 4.3 ± 3.4 ($p = 0.049$) after one month, 3.3 ± 3.7 ($p = 0.024$) after two months, and 2.8 ± 3.8 ($p = 0.020$) after three months of O_3T . The median value of "pain symptom" according to the U.S. National Cancer Institute Common Terminology Criteria for Adverse Events v. 5.0 showed a decrease from 3 (range: 2–3) to 1 (range: 0–3) ($p = 0.046$). [11].

The mechanism of action of ozone doses is explained by the homeceutical effect. It cannot be explained by pharmacological standards. Absorption, distribution, metabolism and excretion are outside

of its pharmacological principles [16]. Ozone dose and biological effects do not show a linear relationship [17].

There are many studies on the analgesic effect of ozone therapy. In a study where patients with cervical disc hernias were administered fluoroscopically intradiscal ozone-oxygen mixtures and patients were followed up for 6, patient satisfaction even after 6 months, (VAS); visual analog scale; (ODI); Oswestry Disability Index scores were decreased. Ozone therapy was mostly used in patients with lumbar disc herniation [18]. In a study conducted by Andreula et al, compared the ozone-oxygen and periganglionic steroid injections with lumbar level in patients with LDH and found the ozone-oxygen mixture applied alone to be 70.3% more successful (Andreula CF 2003). Muto et al found it more satisfactory in the long-term (12 and 18 months) follow-ups of both intradiscal and infraforaminal ozone-oxygen injections. They found that the maximum recovery was in the 6th month and that it continued in the 18th month [20]. Buric et al. Reported that LDH patients did not experience a similar pain episode after intradiscal ozone injection for 10 years [21].

Conclusion

Ozone therapy and acupuncture applications can be added to the treatment in patients who are suitable for neuropathy complaints after cancer treatment and satisfactory results can be obtained.

References

- Argyriou, A. A., Bruna, J., Marmioli, P., & Cavaletti, G. (2012). Chemotherapy-induced peripheral neurotoxicity (CIPN): An update. *Critical Reviews in Oncology/Hematology*, 82(1), 51–77.
- Baron, R. (2006). Mechanisms of Disease: neuropathic pain—a clinical perspective. *Nature Clinical Practice Neurology*, 2(2), 95–106.
- Beijers, A. J. M., Jongen, J. L. M., & Vreugdenhil, G. (2012). Chemotherapy-induced neurotoxicity: The value of neuroprotective strategies. *Netherlands Journal of Medicine*, 70(1), 18–25.
- Bhandari, B., Mehta, B., Mavai, M., & Raj Singh, Y. (2016). Chemotherapy Induced Peripheral Neuropathy; Mechanism and Treatment. *International Physiology*, 4(2), 73–76
- Kaley, T. J., & Deangelis, L. M. (2009). Therapy of chemotherapy-induced peripheral neuropathy. *British Journal of Haematology*, 145(1), 3–14.
- Hershman, D. L., Lacchetti, C., Dworkin, R. H., Lavoie Smith, E. M., Bleeker, J., Cavaletti, G., ... Loprinzi, C. L. (2014). Prevention and management of chemotherapy-induced peripheral neuropathy in survivors of adult cancers: American society of clinical oncology clinical practice guideline. *Journal of Clinical Oncology*, 32(18), 1941–1967.
- Chiang CY, Chang CT, Chu HL, Yang LF. (1973). Peripheral afferent pathway for acupuncture analgesia. *Sci Sin*;16:210-17.
- Takehige C, Sato T, Komugi H. (1980) Role of periaqueductal central gray in acupuncture analgesia. *Acupuncture Electrother Res*;5:323-37.
- Takehige C, Nakamura A, Asamoto S, Arai T. (1992). Positive feed-back action of pituitary beta endorphin on acupuncture analgesia afferent pathway. *Brain Res Bull*;27:37-44
- Zhang R, Lao L, Ren K, Berman BM. (2014). Mechanisms of acupuncture-electroacupuncture on persistent pain. *Review. Anesthesiology*. Feb;120(2):482-503. doi: 10.1097/ALN.000000000000101.
- Clavo B, Navarro M, Federico M, Borrelli E, Jorge IJ, Ribeiro I, Rodríguez-Melcon JI, Caramés MA, Santana-Rodríguez N, Rodríguez-Esparragón F. (2020). Ozone Therapy in Refractory Pelvic Pain Syndromes Secondary to Cancer Treatment: A New Approach Warranting Exploration. *Journal of Palliative Medicine* Vol. 24, No. 1. **Published Online:** 18 Dec 2020
- Bocci V. (2006). Scientific and medical aspects of ozone therapy. state of the art. *Archives of Medical Research*;37:425–435
- Bocci V, Valacchi G, Corradeschi F, Fanetti G, (1998). Studies on the biological effects of ozone: 8. Effects on the total antioxidant status and on interleukin-8 production. *Mediat Inflamm*;7:313-317.
- Bocci, V.; Borrelli, E.; Travagli, V.; Zanardi, I. (2009). The ozone paradox: Ozone is a strong oxidant as well as a medical drug. *Med. Res. Rev.*, 29, 646–682.
- (Bocci, V.A.; Zanardi, I.; Travagli, V. (2011). Ozone acting on human blood yields a hormetic dose-response relationship. *J. Transl. Med.* 9, 66.
- Viebahn-Hansler, R.; Leon Fernandez, O.S.; Fahmy, Z. (2012). Ozone in Medicine: The Low-Dose Ozone Concept—Guidelines and Treatment Strategies. *Ozone-Sci. Eng.*, 34, 408–424.
- Re, L.; Malcangi, G.; Martínez-Sánchez, G. (2012). Medical ozone is now ready for a scientific challenge: Current status and future perspectives. *J. Exp. Integr. Med.* 2, 193–196.
- Beyaz SG, Sayhan H. (2018). Six-Month Results of Cervical Intradiscal Oxygen-Ozone Mixture Therapy on Patients with Neck Pain: Preliminary Findings. *Pain Physician*. Jul;21(4):E449-E456.
- Andreula CF, Simonetti L, De Santis F, et al. (2003) Minimally invasive oxygen-ozone therapy for lumbar disk herniation. *AJNR Am J Neuroradiol*; 24:996-1000.
- Muto M, Andreula C, Leonardi M. (2004). Treatment of herniated lumbar disc by intradiscal and intraforaminal oxygen-ozone (O2-O3) injection. *J Neuroradiol*; 31:183-189.
- Buric J, Rigobello L, Hooper D. (2014). Five- and ten-year follow-up on intradiscal ozone injection for disc herniation. *Int J SpineSurg*; 8:17.



This work is licensed under Creative Commons Attribution 4.0 License

To Submit Your Article Click Here: [Submit Manuscript](#)

DOI: [10.31579/CCOR-2021/019](https://doi.org/10.31579/CCOR-2021/019)

Ready to submit your research? Choose Auctores and benefit from:

- fast, convenient online submission
- rigorous peer review by experienced research in your field
- rapid publication on acceptance
- authors retain copyrights
- unique DOI for all articles
- immediate, unrestricted online access

At Auctores, research is always in progress.

Learn more auctoresonline.org/journals/clinical-cancer-and-oncology-research-