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Case Study

Acupuncture-like transcutaneous nerve stimulation therapy success after 5 years post-radiation-induced xerostomia: a case report

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Abstract

Background: Success with acupuncture-like transcutaneous nerve stimulation (ALTENS) in the treatment of radiation-induced xerostomia has not been reported after an extended time.

Methods: We report a case of successful ALTENS therapy 5 years after radiation treatment.

Results: The patient discontinued treatments in a second course due to complete resolution of symptoms.

Conclusion: This case report demonstrates a potential for offering ALTENS to those long suffering from radiation-induced xerostomia.

Keywords: acupuncture-like transcutaneous nerve stimulation; ALTENS; radiation-induced xerostomia

INTRODUCTION

Xerostomia is one of the most common toxicities of chemoradiation in the treatment of head and neck cancer, and is primarily a result of radiation-induced damage to the parotid glands. Because xerostomia can eventually lead to a range of issues starting with acute mucositis and increased risk of oral candidiasis, to dental caries, painful denture fitting, speech and even changes in taste perception, there is an undeniable bearing on the quality of life.[1,2] Current treatments with pharmacologic sialogogues such as oral pilocarpine or saliva substitutes have been shown to provide some temporary relief however these may also cause intolerable cholinergic side effects.[2,3]

Saliva serves multiple roles including protection, taste sensation, buffering, digestion, mineralisation, lubrication and tissue coating.[4,5] Typically, the magnitude of reduction of salivary production is related to the radiation dosage and the volume of salivary gland tissue in the treatment field with significant decrease in flow of saliva seen within the first few days of treatment with an average nadir of 3 weeks.[6] The duration of radiation-induced xerostomia is controversial, with variable evidence for partial recovery.[7]

Studies involving acupuncture-like transcutaneous nerve stimulation (ALTENS) have had

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promising results suggesting durably improved saliva production, without many of the side effects of standard pharmacologic treatment.[3,6,8] Both the single institution and multi-institution reports have showed benefit in patients ranging from 3 to 27 months from the time of completion of chemoradiation therapy to beginning ALTENS therapy.[3,6,8] ALTENS in patients further removed from completion of radiation therapy has not previously been reported.

CLINICAL HISTORY

A 69-year-old male with history of T2N2 base of tongue cancer underwent definitive treatment with concurrent cisplatin and external beam radiation therapy as previously described and completed on 8 December 2009.[9] The patient tolerated treatment relatively well; however, soon after completing treatment, he endorsed moderate xerostomia requiring him to carry around a water bottle and frequently use ice chips, which only temporarily palliated daily symptoms. In 2010, the patient was enrolled on RTOG 0537 and randomised to receive pilocarpine.[6] This therapy did not appreciably improve his xerostomia. Xerostomia did not improve over the next 5·5 years of follow-up.

Recently our department made ALTENS available to all patients without charge. This patient was offered ALTENS therapy and completed one round of twice weekly for 12 weeks/RTOG 0537.[8] Following this course, the patient reported continued xerostomia without significant improvement. At the patient's request to 'try something else', a second round of ALTENS was decided upon. After 20 treatments in the second round, he reported that he would not be continuing because his xerostomia had resolved, and he now was having 'drooling'. One year later, the patient has maintained his abundant saliva production and it was noted that he has not had any changes to his chronic medications in the last 2-year interval.

DISCUSSION

In a single institution, phase II trial, Wong et al.,[3] demonstrated that ALTENS was able to improve saliva production with improvement in xerostomia symptoms that were sustained for at least 6 months after completion of the ALTENS therapy with patients no more than 27 months from initial radiation therapy.[3] The cooperative multi-centre phase II study that followed, RTOG 0537, limited eligibility to patients who had completed radiation therapy greater than 3 months but less than 2 years previously.[6,8] Thus, there have been no current or previous studies evaluating potential benefits of ALTENS therapy for patients with long-standing symptoms greater than 2 years.

RTOG 0537 established an ALTENS regimen of twice weekly, 20-minute sessions for 12 weeks. ALTENS efficacy was evaluated using the self-reported University of Michigan Xerostomia-Related Quality of Life Scale (XeQOLS) given at baseline and at 6 months after treatment.[10] In the phase II results, positive treatment response was seen in 86% of patients, with a median percent of XeQOLS score reduction of 42·9%, and no significant associated acute side effects.[8] The recently published phase III results showed ALTENS was at least equivalent to pilocarpine in the percent of XeQOLS score reduction and had a higher proportion of positive responders at 15 months (83 and 63%, respectively; $p = 0{\cdot}04$).[6] In addition, there was significantly less grade 3 or less adverse events seen in the ALTENS group (20·8% of the ALTENS group versus 61·6% of the pilocarpine).[6]

Given these phase III findings and the current report, it may be of interest to consider studying the efficacy of ALTENS therapy in the treatment of radiation-induced xerostomia for patients that have had a lengthy duration since the end of their radiation treatment. Though we have no formal measures of xerostomia in this patient, his ability to produce and maintain enough saliva to drool requires no advanced metrics to be impressive. The potential of offering such a therapy to those patients seen routinely in follow-up at 3 years, 5 years and beyond might benefit a long-suffering population.

CONCLUSION

ALTENS has been shown to be effective in the reduction of symptoms of xerostomia secondary

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to radiation therapy, however, this has only been observed in patients that completed radiation less than 27 months previously. Our findings offer a promising potential benefit for those longer suffering patients with radiation-induced xerostomia.

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References

1. Bruce S D. Radiation-induced xerostomia: how dry is your patient? Clin J Oncol Nurs 2004; 8: 61–67.
2. Warde P, O'Sullivan B, Aslanidis J et al. A phase III placebo-controlled trial of oral pilocarpine in patients undergoing radiotherapy for head-and-neck cancer. Int J Radiat Oncol Biol Phys 2002; 54: 9–13.
3. Wong R K, Jones G W, Sagar S M, Babjak A F, Whelan T. A phase I-II study in the use of acupuncture-like transcutaneous nerve stimulation in the treatment of radiation-induced xerostomia in head-and-neck cancer patients treated with radical radiotherapy. Int J Radiat Oncol Biol Phys 2003; 57: 472–480.
4. Jensen S B, Pedersen A M, Reibel J, Nauntofte B. Xerostomia and hypofunction of the salivary glands in cancer therapy. Support Care Cancer 2003; 11: 207–225.
5. Nauntofte B, Tenovuo J, Lagerlöf F. Secretion and composition of saliva. In: Ole Fejerskov (ed.). Dental Caries the Disease and its Clinical Management. Oxford: Blackwell Munksgaard, 2003: 7–29.
6. Wong R K, Deshmukh S, Wyatt G et al. Acupuncture-like transcutaneous electrical nerve stimulation versus pilocarpine in treating radiation-induced xerostomia: results of RTOG 0537 phase 3 study. Int J Radiat Oncol Biol Phys 2015; 92 (2): 220–227.
7. Eisbruch A, Kim H M, Terrell J E, Marsh L H, Dawson L A, Ship J A. Xerostomia and its predictors following parotid-sparing irradiation of head-and-neck cancer. Int J Radiat Oncol Biol Phys 2001; 50: 695–704.
8. Wong R K, James J L, Sagar S et al. Phase 2 results from Radiation Therapy Oncology Group Study 0537: a phase 2/3 study comparing acupuncture-like transcutaneous electrical nerve stimulation versus pilocarpine in treating early radiation-induced xerostomia. Cancer 2012; 118: 4244–4252.
9. Mix M. Randomized phase II trial of selenomethionine as a modulator of efficacy and toxicity of chemoradiation in squamous cell carcinoma of the head and neck. World J Clin Oncol 2015; 6: 166–173.
10. Henson B S. Preserved salivary output and xerostomia-related quality of life in head and neck cancer patients receiving parotid-sparing radiotherapy. Oral Oncol 2000; 37: 84–93.