Original Research Article

EFFECTIVENESS OF AURICULAR ACUPRESSURE TO CONTROL THE POST-OPERATIVE DENTAL EXTRACTION PAIN: A HOSPITAL BASED INTERVENTIONAL STUDY

Lubna Fathima[1], Sindhu R[2], PrabuD[3], Raj Mohan M[4], Nimmy P[5]

[1] *Master of Dental Surgery, Department of Public Health Dentistry, Madha Dental College and Hospital, Kundrathur, Chennai, India*

[2] *Master of Dental Surgery, Senior lecturer, Department of Public Health Dentistry, SRM Dental College, Ramapuram, Chennai, India*

[3]*Master of Dental Surgery, Professor and Head, Department of Public Health Dentistry, SRM Dental College, Ramapuram, Chennai, India*

[4] *Master of Dental Surgery, Reader, Department of Public Health Dentistry, SRM Dental College, Ramapuram, Chennai, India*

[5]*Postgraduate (Master of Dental Surgery), Department of Public Health Dentistry, SRM Dental College, Ramapuram, Chennai, India*

Received: 03-05-2022 / Revised: 07-06-2022 / Accepted: 10-07-2022
Corresponding author: Dr. Prabu D
Conflict of interest: Nil

Abstract

Background: Pain being one of the important factors which is unbearable by patients and their often turn-up to the clinician due to pain. Here is an innovative treatment to control pain, the auricular acupressure which is a traditional medicine of China which serves as an emerging treatment in both medical and dental sciences**.**

Aim: This study aims to assess the effectiveness of auricular acupressure to control post-operative dental extraction pain.

Setting and design: The study was an interventional study conducted in hospital set-up.

Material and methods: One eighty individuals participated in the study which was conducted among the individual undergone extraction. The recruited participant were divided into 2 groups, shenmen auricular acupressure points were given to the experimental group and placebo auricular acupressure points were given to the control group. Verbal descriptor scale was recorded to know the degree of pain in both the study groups.

Statistical analysis: Inferential statistics were calculated for all the variables recorded in our study using SPSS software version 26.0.

Results: One way Anova was done to assess the effectiveness of auricular acupressure group over the placebo group using the visual pain scale and found an statistically significant result which obtained an P-Value <0.005.

Conclusion: This study found that auricular acupressure shenmen point is proven to be statistically significant and reduces the post operative dental extraction pain.

Keywords: Auricular acupressure, Extraction, Pain, Hospital

Introduction

Pain is a subjective experience caused by the interaction of the body to various physiological and psychosocial activities[1].Management of post-operative dental extraction pain is an essential procedure to be done to control the pain elicit by the extraction of the tooth from the socket which can be done by dentist and oral surgeons. There are various methods to control dental extraction pain, which includes non- Opioid analgesics mainly the acetaminophen and non-steroidal anti-inflammatory drugs(NSAIDs) namely ibuprofen[2]in these methods NSAIDs are considered as superior went given in conventional dose went compared to the Opioid analgesics[3,4] . Weiser et al[5]have explained in his study that ibuprofen along with caffeine is proven to be effective to control the post-operative dental extraction pain, but we dentist and oral surgeon do not use it in combination with caffeine, which lead to formulate the alternative therapy to control post operative dental extraction pain with the acupressure.

One of the non-pharmacological methods for controlling post-operative dental extraction pain is the use of acupressure. This method carries numerous advantages which are being non-invasiveness, lack of need to any special tool or instrument, availability and the ease of use and learning by nurses and patients which can finally lead to its application by patients themselves and the elimination of need to being visited at doctor's office. Acupressure is a non-invasive method for treating post operative dental extraction pain which has the same effect as acupuncture and can be administered in different parts of body. Auricular acupressure is a form of alternative and traditional medicine which is followed in china and mainly focuses on the ear organ and the points in the ear which includes the autonomic, shenmen, lung, liver and kidney point's .The mechanism of action of acupressure is it stimulates the nerve system which regulates the neurotransmitter via nor epinephrine and b-endorphin[6].Acupressure has various other uses in the field of dentistry which includes dental anxiety[7], trismus[8],gagging[9], tobacco cessation[10], orthodontic post adjustment pain[11] and nail biting[12].White et al[13] have proven that auricular acupressure is effective than auricular acupuncture, hence acupressure was taken into account. Since, they were no literature available to prove the effectiveness of auricular acupressure in control of post operative dental extraction pain. So the main objective of the study is to assess the effectiveness of auricular acupressure and body acupressure to control the post-operative dental extraction pain.

1. Materials and Methods

2.1 Design, settings, and participants:

An interventional study was done to assess the effectiveness of auricular acupressure to control the post-operative dental extraction pain. The study was conducted in SRM dental college and hospital, Ramapuram in the department of oral and maxillofacial surgery. Ethical clearance approval was obtained from the college review board before conducting the study. The study was conducted in the month of January 2020. According to the previous study[14]sample size was calculated and obtained as hundred and eighty final study sample.

2.2 Selection Criteria:

2.2.1 Inclusion criteria:

1. Patient who are not taking any antibiotics from past one month.
2. Patient who have extracted they teeth due to any decay were included in the study.
3. Patient who has not underwent extraction from past 1 month.
4. Patients who are willing to participate in the study.

2.2.2 Exclusion criteria:

1. Patient who are taking any antibiotics medication for past 1 month.
2. Patient is a hypertensive patient and is under medication.
3. Patient is a diabetic under medication.
4. Patient who have abscess from past 1 month were excluded from the study.

The individuals who met the inclusion criteria and who signed the informed concern form were allotted into experimental and control group according to the random sequence generation done by random sequence number. Random number were sealed in a consecutive opaque paper and individuals were asked to pick a paper, the individuals who took odd number were allotted to experimental group and individuals who took even number were allotted to control group. Demographic details of the patient was collected which includes the age, gender of the patient, education status, occupation and economic status. Under local anaesthesia extraction was done and after the extraction, we placed melastoma candidium seeds in shenmen points for experimental group and placebo auricular points for control group. While placing the seeds, verbal descriptive pain scale was recorded to assess the pain felt by patient while placing melastoma candidium seeds. The verbal descriptor scale consists of score 0-10. A higher score indicates that patient has high degree of pain during the treatment and low score indicates that patient ahs low degree of pain during the treatment, the score indicates the following: 0(very happy, no hurt) 1-2 (hurts just a little bit) 3-4 (hurts a little more) 5-6 (hurts even more) 7-8 (hurts a whole lot) 9-10 (hurts as much as you can imagine). The verbal descriptor scale was recorded at the baseline before the extraction of the tooth and after the extraction while placing the melastoma candidium seeds.

After the verbal descriptor scale was recorded, Patients were asked to give a firm pressure through the seeds placed in ear for 30 seconds for 3 times a day in morning, afternoon and before bed for 3 days. Patient phone numbers were collected and we also gave phone number to the patient to contact us if the patient had any discomfortability in the treatment. Patients were asked to report after 3 days since the extraction was performed and verbal descriptive scale was recorded to assess the degree of reduction of pain felt after 3 days of extraction.

Statistical analysis was performed using SPSS for windows version 26.0. The Normality tests Kolmogorov-Smirnov and Shapiro-Wilks tests results reveal that distribution were not normally distributed, no parametric test were used. Descriptive statistics was used to find the percentage and frequency distribution between the demographic details recorded. Inferential statistics was used to compare the mean values of verbal descriptor scale, Kruskal Wallis test was used to compare the difference between the mean in experimental and control group.

2. Results

A total of 180 individuals who agreed to participate and signed the informed consent form were included in the study. The Normality tests Kolmogorov-Smirnov and Shapiro-Wilks tests results reveal that verbal descriptor scale scores does not follow normal distribution. To compare mean values between the two procedures, Kruskal Wallis test is used followed by Bonferroni adjusted

Mann Whitney test for multiple pair wise comparison. Table 1shows the demographic details of participants included in the study which shows that most of the participants in experimental and control group were found to be ≥35 years old.Table 2 showed the verbal descriptor pain score during the insertion of the melastoma candidium beeds and p value for both the experimental and control group. Table 3 showed the average verbal descriptor score was recorded after 3 days of extraction and p value was obtained for both the experimental and control group. Table 2 shows comparison of VDS score between the pre-operative period, post-operative and during follow-up period. Mean and standard during the per-operative period were found to be slightly lesser in auricular acupressure group (2.14±1.95). During the post-operative period, mean and standard deviation were comparatively much lesser in auricular acupressure group (1.52±0.80) when compared to the other procedure. During follow up period, mean and standard deviation were much lesser in auricular acupressure group (1.19±0.63). P value found to be <0.05 during the post-operative and follow up period which implies much difference was obtained among the procedure included in the study group. Table 3 shows the pair wise comparison between the study groups at different time interval. P values were computed and statistical differences were obtained in post-operative period and during the follow-up.

Table 1: Characterization of qualitative socio-demographic variables

Variables	Experimental group N-90 (%)	Control group N-90 (%)
Age in years		
≤19 year	4.6	2.3
20-24 years	13.7	11.4
25-29 years	31.7	38.6
30-34 years	13.6	6.9
≥35 years	36.4	40.8
Gender		
Male	83.8	73
Female	16.2	27
Education		
Professional or honour	9.1	9.1
Graduate	38.6	52.3
Intermediate or diploma	20.5	22.7
High school certificate	31.8	15.9
Income		
Less income than expenses	38.6	40.9
Enough income for expenses	61.4	59.1

Table 2: Independent-Samples Kruskal-Wallis Test to compare VDS score between two procedures

		Procedure		p-value
		Auricular acupressure group	Control group	
Pre-operative	N	90	90	0.102

VDS Score	Mean	2.1452	2.7857	
	Median	2.0000	2.0000	
	Standard deviation	1.95887	2.62758	
	Variance	3.837	6.904	
	Minimum	.00	.00	
	Maximum	7.00	8.00	
Post-operative VDS Score	N	90	90	0.001
	Mean	1.5238	3.1429	
	Median	1.0000	2.0000	
	Standard deviation	.80359	2.22592	
	Variance	.646	4.955	
	Minimum	1.00	1.00	
	Maximum	4.00	8.00	
Follow up VDS Score	N	90	90	<0.001
	Mean	1.1905	3.4524	
	Median	1.0000	2.5000	
	Standard deviation	.63392	2.45150	
	Variance	.402	6.010	
	Minimum	.00	3.00	
	Maximum	3.00	8.00	

3. Discussion

Auricular acupressure has proven its effective role in both dental and medical field and mainly it deals with the ear as the primary organ. As in our study we have taken shenmen auricular points instead of other standard points because it regulates the brainstem and cortex to avoid imbalances in the patient which further calms the mind and heart of the patient, since shenmen point is proven to be effective analgesic[15,16]. Avisa et al[7] has conducted a study to prove the effectiveness of acupressure for dental anxiety and found to be used as an alternative measure for controlling dental anxiety. Vachiramon et al[11] has conducted a study to reduce the post adjustment of orthodontic pain relieve and found the results were statistically significant which was in accordance with our study. They were more number of males were enrolled for extraction of the teeth during the period of conducting the study than the females. The education qualification of patients enrolled in both experimental and control group were found to be more in primary school 38.6% in experimental group and 52.3% in control group. Nearly 71.8% of the participant in experimental group and 74.1% of the participant in control group were working individuals. Verbal descriptor scales were assessed during the pre-operative, post-operative and follow up period. The mean and standard deviation was comparatively less in post-operative and follow up period when compared to the control group. The minimum and maximum score recorded in pre-operative period were 0-7 in auricular acupressure group and 0-8 in control group. During the post-operative intervention, the minimum and

maximum score were 1-4 in auricular acupressure group and 1-8 in control group. During the follow-up period, the minimum and maximum score were 0- 3 in auricular acupressure group and 3-8 in control group. P value showed statistical difference among the auricular acupressure and control group which implies that auricular acupressure is comparatively effective in reducing the pain. The limitation of the study was since the follow up was done only after 3 days from extraction it can be recorded after 1 day of extraction till the 7^{th} day so that the difference in each day can be calculated.

4. Conclusion

This study found that auricular acupressure shenmen point is proven to be statistically significant and reduces the post operative dental extraction pain. Taking the obtained results from this study we conclude that programs should be initiated and the personnel enhanced in extraction should be taught to reduce the pain by auricular acupressure which will benefit the patient to reduce the post operative dental extraction pain.

Reference

1. Chung UL, Hung LC, Kuo SC, Huang CL. Effects of LI4 and BL 67 acupressure on labor pain and uterine contractions in the first stage of labor. *The journal of nursing research*: JNR. 2003 Dec;11(4):251-60.
2. Becker DE. Pain management: Part 1: Managing acute and postoperative dental pain. *Anesthesia progress*. 2010 Jun;57(2):67-79.
3. Forbes JA, Kehm CJ, Grodin MC, Beaver WT. Evaluation of ketorolac, ibuprofen, acetaminophen, and an acetaminophen-codeine combination in postoperative oral surgery pain. Pharmacotherapy: *The Journal of Human Pharmacology and Drug Therapy*. 1990 Nov 12;10(6P2):94S-105S.
4. Fricke JR, Angelocci D, Fox K, McHugh D, Bynum L, Yee JP. Comparison of the efficacy and safety of ketorolac and meperidine in the relief of dental pain. *The Journal of Clinical Pharmacology*. 1992 Apr 1;32(4):376-84.
5. Weiser T, Richter E, Hegewisch A, Muse DD, Lange R. Efficacy and safety of a fixed-dose combination of ibuprofen and caffeine in the management of moderate to severe dental pain after third molar extraction. *European Journal of Pain*. 2018 Jan;22(1):28-38.
6. Wang YY, Liu Z, Wu Y, Yang L, Guo LT, Zhang HB, Yang JS, Chinese Acupuncture for Tobacco Cessation Research Team. Efficacy of acupuncture is noninferior to nicotine replacement therapy for tobacco cessation: results of a prospective, randomized, active-controlled open-label trial. *Chest*. 2018 Mar 1;153(3):680-8.
7. Avisa P, Kamatham R, Vanjari K, Nuvvula S. Effectiveness of Acupressure on Dental Anxiety in Children. *Pediatric Dentistry*. 2018 May 15;40(3):177-83.
8. Ferreira DC, De Rossi A, Torres CP, Galo R, Paula-Silva FW, de Queiroz AM. Effect of laser acupuncture and auricular acupressure in a child with trismus as a sequela of medulloblastoma. *Acupuncture in Medicine*. 2014 Apr;32(2):190-3.
9. Thangarajan ST, Chidambaram R, Veeravalli PT, Mohamed K. An Innovative Approach to Overcome Gagging Through Acupressure for an Edentulous Patient: A Case Report.

Alternative Therapies in Health & Medicine. 2017 Dec 1;23(7).

10. White AR, Rampes H, Liu JP, Stead LF, Campbell J. Acupuncture and related interventions for smoking cessation. *Cochrane Database of Systematic Reviews*. 2014(1).

11. Vachiramon A, Wang WC. Acupuncture and acupressure techniques for reducing orthodontic post-adjustment pain. *The journal of contemporary dental practice*. 2005 Feb;6(1):163-7.

12. Sun D, Reziwan K, Wang J, Zhang J, Cao M, Wang X, Wang X, Liu J, Li B, Dilimaolati R, Zhong L. Auricular Acupressure Improves Habit Reversal Treatment for Nail Biting. *The Journal of Alternative and Complementary Medicine*. 2019 Jan;25(1):79-85.

13. White A, Moody R: The effects of auricular acupuncture on smoking cessation may not depend on the point chosen-an exploratory metaanalysis. *Acupunct Med* 2006, 24:149-156.

14. Ruela LD, Iunes DH, Nogueira DA, Stefanello J, Gradim CV. Effectiveness of auricular acupuncture in the treatment of cancer pain: randomized clinical trial. *Revista da Escola de Enfermagem da USP*. 2018;52.

15. Asher GN, Jonas DE, Coeytaux RR, Reilly AC, Loh YL, Motsinger-Reif AA, Winham SJ. Auriculotherapy for pain management: a systematic review and meta-analysis of randomized controlled trials. *The Journal of Alternative and Complementary Medicine*. 2010 Oct 1;16(10):1097-108.

16. Round R, Litscher G, Bahr F. Auricular acupuncture with laser. *Evidence-Based Complementary and Alternative Medicine.* 2013;2013.