Int. J. Oral Maxillofac. Surg. 2019; 48: 669–674
https://doi.org/10.1016/j.ijom.2018.10.014, available online at https://www.sciencedirect.com

International Journal of Oral & Maxillofacial Surgery

Randomised Controlled Trial
Oral Surgery

Effects of auriculotherapy and midazolam for anxiety control in patients submitted to third molar extraction

A. G. Dellovo, L. M. A. Souza, J. S. de Oliveira, K. S. Amorim, F. C. Groppo
Oral Surgery and Anaesthesiology, Department of Dentistry, Federal University of Sergipe, Aracaju, Cidade Nova, Sergipe, Brazil

A. G. Dellovo, L. M. A. Souza, J. S. de Oliveira, K. S. Amorim, F. C. Groppo: Effects of auriculotherapy and midazolam for anxiety control in patients submitted to third molar extraction. Int. J. Oral Maxillofac. Surg. 2019; 48: 669–674.

Abstract. Anxiety is common and still represents a barrier to appropriate professional care for patients requiring dental treatment. The aim of this study was to compare the effects of auriculotherapy and midazolam for the control of anxiety in patients submitted to third molar extractions. This was a randomized, double-blind, controlled, crossover clinical trial. Thirty healthy volunteers requiring bilateral third molar extraction received midazolam 15 mg (oral) and sham auriculotherapy during one session, and a placebo tablet (oral) and auriculotherapy during the other; the sessions were randomized. The level of anxiety was assessed through questionnaires and physical parameters (blood pressure, heart rate, and oxygen saturation (SpO_2)) at three time points: baseline, on the day of surgery, and at follow-up. No significant differences between the protocols were observed for blood pressure and SpO_2. Auriculotherapy induced a lower heart rate than midazolam during some periods. Auriculotherapy induced more events remembered after surgery than midazolam ($P < 0.0001$). More undesirable effects were observed with midazolam ($P < 0.0001$). However, patient preference for auriculotherapy (53.3%) was not higher than preference for midazolam (46.7%). Auriculotherapy showed an anxiolytic effect equivalent to the midazolam effect, without the undesirable effects usually attributed to the benzodiazepine.

Key words: anxiety; auriculotherapy; third molar surgery; midazolam.

Accepted for publication 17 October 2018
Available online 12 November 2018

Fear and anxiety are common in dental patients, representing one of the biggest barriers to adequate professional dental care[1–3]. Fear is a primitive, basic emotion tied to the fight-or-flight response, activated during an imminent and specific threat, while anxiety is a conditioned response characterized by anticipation of a potential or future threat[3,4]. The intensity of dental anxiety varies according to the patient and is clearly affected by the type of procedure[3].

Behavioural observation and the recognition of signs such as pupil dilation, paleness, excessive sweating, tremors, in-

creased blood pressure and heart rate, dizziness, dry mouth, weakness, and respiratory distress contribute to the identification of anxiety in patients seeking dental care[1].

Midazolam is a benzodiazepine used widely in sedation for dental procedures.

It effectively reduces anxiety without producing cardiorespiratory instability. Midazolam is the usual choice due to its rapid onset, great anxiolytic potency, water solubility, low toxicity, rapid elimination, and short anxiolytic effect (30 to 40 minutes). However, it can cause respiratory depression in predisposed patients, and its variable oral absorption can cause unexpected sedation levels[5].

Complementary therapies are often sought in order to overcome altered emotional states. Nowadays, emotional imbalance is common, and complementary therapies have gained scientific credibility, increasing the use of traditional practices[6,7]. Auriculotherapy is used to treat physical and mental illnesses through the stimulation of points located on the auricle. It originated in China between 2000 BC and 100 BC[7], and is based on a set of anatomical maps superimposed on the ear. Each ear has reflex points that correspond to the organs and functions of the body. Auricular points may be stimulated with needles, seeds, percutaneous electrical nerve stimulation, or laser[8].

Auriculotherapy can be associated with phytotherapy, in order to stimulate certain acupuncture points with medicinal seeds[9,10]. Mustard seed (*Brassica juncea*) is used widely in imbalances of the lung, stomach, and liver. It is also used widely in bronchitis, congestion, headache, pharyngitis, flu, paralysis, pneumonia, common cold, rheumatism, and cough. It has analgesic, antiseptic, disinfectant, diuretic, emetic, stimulant, and expectorant properties[10–15]. Acupressure associated with phytotherapy has shown a low risk of collateral effects and addiction[16].

The aim of this study was to compare the effects of auriculotherapy (associated with mustard seed) and midazolam for the control of anxiety in patients submitted to third molar extractions.

Materials and methods

The study was approved by the University Hospital Research Ethics Committee of the Federal University of Sergipe. This was a randomized, double-blind, crossover study. Thirty patients attending the Department of Dentistry of the Federal University of Sergipe were selected. These patients had diagnoses and indications for bilateral third molar extraction. All were asymptomatic with a similar position and level of surgical difficulty (according to panoramic radiographs), being classified in position 2B of the Pell and Gregory classification[17]. All participants were informed of both the risks and benefits of the study, and signed an informed consent agreement. Exclusion criteria were age <18 years, American Society of Anesthesiology (ASA) III or ASA IV status, use of any medication within 15 days before the beginning of the research, hypersensitivity to the drugs, substances, or materials used in this study, pregnancy or lactation, and previous or actual history of pericoronitis.

Group 1 consisted of participants receiving both 15 mg of midazolam (one tablet, administered orally 30 minutes before the surgery started) associated with sham auriculotherapy (coverage of the ear points with a tape, which was placed 5 days before surgery). Group 2 consisted of participants receiving a placebo medication (one tablet, administered orally 30 minutes before the surgery started) associated with auriculotherapy (started 5 days before surgery) at the auricle points indicated in Fig. 1. Mustard seeds covered with tape were used in the auriculotherapy. The extraction side (right or left) and the group (midazolam or auriculotherapy) were assigned randomly on the first day. Surgical procedures were performed in two sessions, one for each side of the mandible. The minimum interval between the first and second surgery was 15 days. The two protocols were only identified at the end of the experiment. Randomization was performed by Random Number Generator Pro 2.15 software.

A single dose of intramuscular dexamethasone (8 mg) was administered 30 minutes before surgery for the prevention of pain and post-surgical oedema. Oral antisepsis was performed by vigorous rinsing for 1 minute with an aqueous solution of 0.12% chlorhexidine digluconate. An alcoholic solution of 10% polyvinylpyrrolidone iodine (PVP-I) was used for extraoral antisepsis.

Local anaesthesia was injected slowly after negative aspiration, using an inferior and lingual alveolar nerve block with 1.8 ml of 2% lidocaine with 1:100,000 epinephrine. The buccal nerve was anaesthetized with 0.9 ml of 4% articaine with 1:100,000 epinephrine. Patients were instructed on local haemostatic care, feeding, cleaning the operated region, restriction of physical exertion, and other routine recommendations. Sutures were removed on the seventh day after surgery. The patients were advised to take one tablet of paracetamol 750 mg every 6 hours for 3 days only in the case of pain.

Assessment of the patient's anxiety level was conducted through questionnaires and the measurement of physical parameters. These assessments were made at three time points: (1) baseline, (2) day of surgery, and (3) the patient's follow-up visit.

Baseline was the initial session, 1 week before the day of the first surgery. The Corah Dental Anxiety Scale was used to classify participants according to their degree of anxiety[18]. After patients had rested for 5 minutes, arterial blood pressure (BP), heart rate (HR), and blood oxygen saturation (SpO_2) were measured by a single operator.

At the second time point, both a researcher and the surgeon related their perception of each patient's anxiety level by answering a questionnaire at the end of each surgery. They classified the patient as 'not anxious', 'mildly anxious', 'moderately anxious', or 'severely anxious'. For moderately and severely anxious patients, both the researcher and the surgeon related the moment of the occurrence of the anxious behaviour during the

Fig. 1. Auricle protocol for anxiety control.

surgery. In addition, BP, HR, and SpO_2 were measured at five points of the procedure: 30 minutes after drug administration and then after local anaesthesia, incision, tooth removal, and suture.

At the third time point, patients returned the self-assessment form answered 24 hours after the surgery, asking about the treatment experience, the occurrence of anterograde amnesia, collateral effects, and their preference for the protocol used in the first or the second surgery.

Data were analyzed by χ^2 test, non-paired *t*-test, Wilcoxon test, Friedman test, Mann–Whitney test, or Fisher's exact test, according to data characteristics. All tests were performed considering a significance level of 5%. A power calculation was performed a priori. Considering 80% of sedation effectiveness (when the previous anxiety level was decreased) for midazolam and only 40% for auriculotherapy, 23 patients would be necessary per group to provide 80% power with a 5% significance level. Larger differences in the effectiveness could be significant with fewer individuals and very small differences would indicate that the two treatments could be interchangeable in terms of effect, since even with a large number of patients there would be no statistically significant differences between the treatments.

Results

No statistically significant difference in age was observed between the male (34.7 ± 6.1 years) and female (28.0 ± 2.7 years) patients (non-paired *t*-test, $P = 0.22$). Body weight also did not differ significantly between male (76.0 ± 6.1 kg) and female (61.8 ± 2.1 kg) patients (Mann–Whitney test, $P = 0.075$).

Figures 2 and 3 show the variation in blood pressure, heart rate, and SpO_2 for the two treatments at the different assessment points.

Systolic blood pressure was significantly decreased (Friedman test) after 30 minutes of treatment and remained lower than the initial level until the last assessment period of the procedure (suture), for both midazolam ($P < 0.0001$) and auriculotherapy ($P = 0.0004$). Comparison of the two treatments at each assessment period separately (Wilcoxon test) revealed no statistically significant differences between them for any of the periods. Diastolic blood pressure showed the same profile, but it started to decrease in the 'local anaesthesia' period, remaining stable until suture.

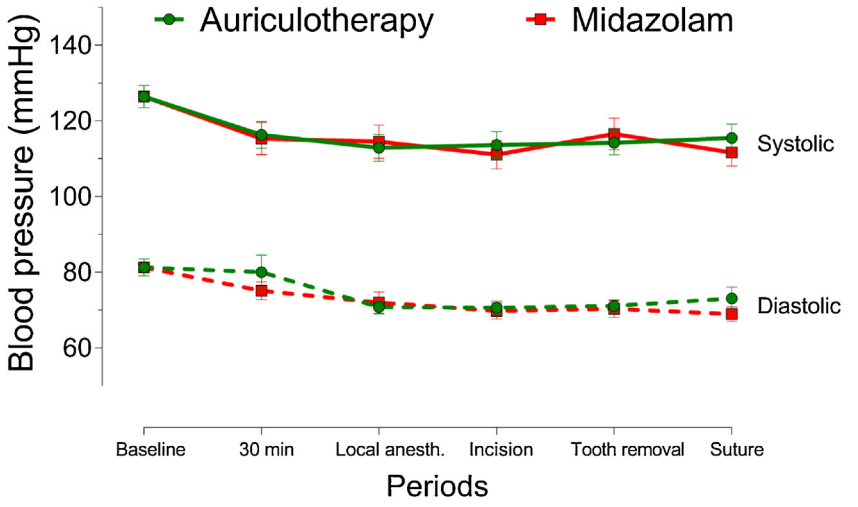

Fig. 2. Systolic and diastolic blood pressure (mean ± standard error) during the periods evaluated, for the two treatments.

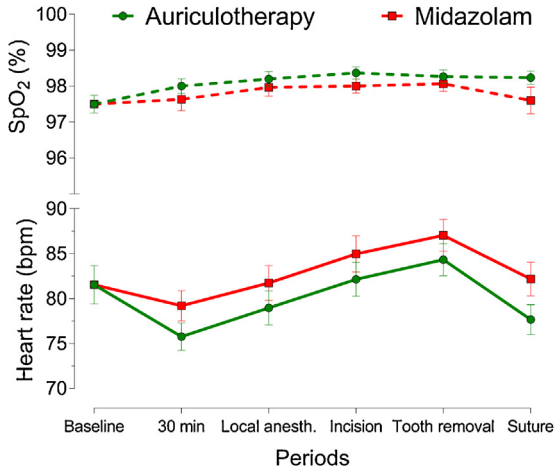

Fig. 3. Heart rate and SpO_2 (mean ± standard error) during the periods evaluated, for the two treatments.

No statistically significant differences in SpO_2 levels were verified among the assessment periods (Friedman test) for either midazolam ($P = 0.25$) or auriculotherapy ($P = 0.06$). Comparison between the two treatments at each assessment point (Wilcoxon test) showed no statistically significant difference between them for any of the periods.

Despite fluctuations, no significant differences (Friedman test, $P > 0.05$) were observed between the baseline HR and values obtained during the other periods in the midazolam group. However, a significant decrease in HR was observed in the auriculotherapy group after 30 minutes of treatment and during suture, when the two periods were compared to the baseline. Auriculotherapy induced a lower HR than midazolam during the periods '30 minutes after drug administration' ($P = 0.0314$), 'tooth removal' ($P = 0.0402$), and 'suture' ($P = 0.0032$).

The patients' self-perception of anxiety at baseline and after the treatment is shown in Table 1. Most of the patients reported mild ($n = 9$) and moderate ($n = 16$) anxiety at baseline. The reduction in anxiety was similar for the two treatments. Twenty-six (86.7%) and 25 (83.3%) of the patients, respectively, presented less anxiety when auriculotherapy and midazolam were used. Higher levels of anxiety than the baseline were verified in one patient using auriculotherapy and in one using midazolam. Indeed, no significant difference was observed between the treatments considering the reduction in anxiety (χ^2 test, $P = 0.74$). The perception of anxiety by the patient (self-perception), operator, and researcher showed no significant differences among them ($P > 0.05$), irrespective of the treatment used.

Table 1. Relative proportions (percentages) of the anxiety levels at baseline (columns) and induced by the two treatments (rows).

		Anxiety level at baseline				
Treatment	Anxiety level after the treatment	Not anxious ($n = 2$)	Mildly anxious ($n = 9$)	Moderately anxious ($n = 16$)	Severely anxious ($n = 3$)	Total ($n = 30$)
Auriculotherapy	Not anxious	2 (100%)	8 (88.9%)	9 (56.3%)	1 (33.3%)	20 (66.7%)
	Mildly anxious	–	1 (11.1%)	6 (37.5%)	1 (33.3%)	8 (26.7%)
	Moderately anxious	–	–	–	1 (33.3%)	1 (3.3%)
	Severely anxious	–	–	1 (6.2%)	–	1 (3.3%)
Midazolam	Not anxious	1 (50%)	7 (77.8%)	8 (50.0%)	2 (66.6%)	18 (60%)
	Mildly anxious	1 (50%)	2 (22.2%)	7 (43.8%)	–	10 (33.3%)
	Moderately anxious	–	–	1 (6.2%)	1 (33.3%)	2 (6.7%)
	Severely anxious	–	–	–	–	–

Table 2 shows the frequency of the perception of the researcher and the operator in relation to the signs and the moment of anxiety. Most of the patients did not present any signs of anxiety at any of the evaluation points. When observing anxiety, the most frequent signals related by both the researcher and operator were agitation and increased respiratory rate. The moments most related to anxiety were during local anaesthesia and the tooth removal. No significant differences were observed between the two treatments.

In the evaluation of the events occurring during the surgery that were remembered by the patient after surgery, it was found that the patients remembered significantly more events when using auriculotherapy than when using midazolam (Fisher's exact test, $P < 0.0001$).

The frequency of undesirable effects observed 24 hours after the treatments is shown in Table 3. The number of undesirable effects was significantly greater when midazolam was used (Fisher's exact test, $P < 0.0001$). Interestingly, the undesirable effects appeared not to influence the patients' preference, since auriculotherapy was preferred by 53.3% of the patients, while midazolam was preferred by 46.7%.

Discussion

Dental anxiety, or the fear of dental procedures, is a relatively common problem[1–5]. Despite the improvements in modern dentistry, dental anxiety scores have remained stable since the mid-1900s[19]. Dental anxiety is associated with postponement or avoidance of dental treatment and hence poorer oral health and oral health-related quality of life[4].

In medicine and dentistry, the efficacy of midazolam for the control of anxiety appears to be well established, based on well-conducted, placebo-controlled clinical trials. The incidence of undesirable side effects with midazolam (e.g., paradoxical effects, hallucinations/fantasies, and anterograde amnesia) may restrict its use. Some of these effects were, in fact, observed in the present study.

Other clinical trials have evaluated the amnesic effect of anxiolytic agents. Among 30 children aged 2 to 4 years undergoing dental treatment, 66.7% of those sedated with intranasal midazolam did not remember a figure presented during the procedure[20]. Coincidently, 66.7% of the patients in the present study related that they remembered absolutely nothing or almost nothing of the surgery.

Two studies comparing auriculotherapy with midazolam have been performed previously[22]. However, they used needles in the auriculotherapy procedure, while we used a less invasive and probably more acceptable approach. The experimental model used in this study, in a crossover design using bilateral extraction of the third molars, was also another difference from those previous studies. The present study also used a sham auriculotherapy, which was not possible in the other designs. Furthermore, auriculotherapy using needles could influence the anxiety[7,21,22].

The procedure for blinding of the volunteers was challenging, since two completely different treatments were tested. According to Zhang et al.[24], patches without seeds at the same acupoints are useful as a sham control method for the ear acupressure procedure. They reported no difference among the sham methods with regard to the outcomes or dropout rates.

Table 2. Signs of anxiety and the moment signs were present, according to the treatments and researcher/surgeon.

	According to researcher		According to surgeon	
	Auriculotherapy	Midazolam	Auriculotherapy	Midazolam
Signs				
Increased heart rate	2 (6.7%)	1 (3.3%)	1 (3.3%)	–
Agitation	7 (23.3%)	7 (23.3%)	7 (23.3%)	7 (23.3%)
Increased respiratory rate	1 (3.3%)	2 (6.7%)	2 (6.7%)	4 (13.3%)
Pallor	–	2 (6.7%)	1 (3.3%)	–
Perspiration	2 (6.7%)	–	1 (3.3%)	1 (3.3%)
Other	1 (3.3%)	–	–	–
None	20 (66.7%)	19 (63.3%)	22 (73.3%)	20 (66.7%)
Moment of anxiety				
Entering the surgery	1 (3.3%)	3 (10%)	1 (3.3%)	1 (3.3%)
Antisepsis	1 (3.3%)	1 (3.3%)	–	–
Local anaesthesia	4 (13.3%)	5 (16.7%)	6 (20%)	9 (30%)
Tooth removal	6 (20%)	3 (10%)	3 (10%)	2 (6.7%)
None	19 (63.3%)	20 (66.7%)	21 (70%)	20 (66.7%)

Table 3. Undesirable effects reported by patients after surgery, according to the treatment used.

Undesirable effects	Auriculotherapy	Midazolam	Total
Restlessness	1 (3.3%)	27 (90%)	28 (93.3%)
Muscle relaxation	1 (3.3%)	11 (36.7%)	12 (40%)
Dizziness	2 (6.7%)	17 (56.7%)	19 (63.3%)
Gastrointestinal problems	0 (0%)	3 (10%)	3 (10%)
None	26 (86.7%)	3 (10%)	29 (96.7%)

Thus, patches without seeds were chosen as the sham intervention in the midazolam group in this study. Additionally, a placebo pill was used in the auriculotherapy group.

Very few studies have compared non-pharmacological procedures with the usual pharmacological treatments for reducing dental anxiety. This study is novel in showing a similar reduction in dental anxiety between oral midazolam (one of the most used benzodiazepines in dentistry) and auriculotherapy (using mustard seeds). The model (third molar extraction) used in this study is fairly well known as a potential inducer of dental anxiety.

A previous study showed an equivalent reduction in dental anxiety induced by auricular acupuncture and by intranasal midazolam during dental extraction[21]. Indeed, auricular acupuncture was considered a good option to decrease anxiety in dental procedures in another study[20]. The results of the present study corroborate those of these previous studies. Moreover, third molar extraction used in the present study is potentially more challenging when considering dental fear. Mustard seeds, being non-invasive, could be considered more attractive than acupuncture needles for most patients, especially those who are anxious.

The physiological parameters measured in this study (blood pressure, SpO_2, HR) remained within acceptable biological levels during all assessment periods, and blood pressure and SpO_2 did not differ between the groups. Auriculotherapy induced a lower HR than midazolam during the periods '30 minutes after drug administration', 'tooth removal', and 'suture', but the values remained at acceptable levels. This indicates that both treatments are safe regarding these parameters.

The intensity of anxiety decreased in most of the patients, irrespective of the treatment used, with the two being interchangeable. These results corroborate those of other studies that have shown a reduction in anxiety with auriculotherapy[4,7,21–24]. However, the patients remembered significantly more of the events occurring during surgery when they had auriculotherapy than when they used midazolam, confirming the retrograde amnesia effect of midazolam[1,5,25]. Also, midazolam was associated with more undesirable effects than auriculotherapy, since only 10% of patients showed no undesirable effects with midazolam treatment.

The reasons for the preference of one treatment over the other, as related by the patients, are not completely clear. Despite the lower number of undesirable effects for auriculotherapy, this was not reflected in the preferences. It is possible that anterograde amnesia could be responsible for the preference regarding the treatment. Some patients stated that they do not like to remember the events occurring during surgery and others stated the opposite.

The anxiolytic effect of the two treatments was comparable and they could therefore be considered interchangeable. It is concluded that auriculotherapy represents a safe and effective alternative to midazolam for conscious sedation in adult patients undergoing mandibular third molar surgery.

Funding

All project financing is the responsibility of the researcher.

Competing interests

There are no competing interests.

Ethical approval

The study was approved by the University Hospital Research Ethics Committee of the Federal University of Sergipe (protocols CEP 080889/2015 and CAAE 48361115.7.0000.5546). REBEC: RBR-67xf25 and UTN number: U111111883570.

Patient consent

Not required.

References

1. Dantas LP, de Oliveira-Ribeiro A, de Almeida-Souza LM, Groppo FC. Effects of Passiflora incarnata and midazolam for control of anxiety in patients undergoing dental extraction. *Med Oral Patol Oral Cir Bucal* 2017;**22**:e95–101.
2. Silveira-Souto ML, São-Mateus CR, de Almeida-Souza LM, Groppo FC. Effect of *Erythrina mulungu* on anxiety during extraction of third molars. *Med Oral Patol Oral Cir Bucal* 2014;**19**:e518–24.
3. Astramskaitė I, Pokevičius L, Juodbalys G. Factors determining tooth extraction anxiety and fear in adult dental patients: a systematic review. *Int J Oral Maxillofac Surg* 2016;**42**:1630–43.
4. Gordon D, Heimberg RG, Tellez M, Ismail AI. A critical review of approaches to the treatment of dental anxiety in adults. *J Anxiety Disord* 2013;**27**:365–78.
5. Pereira-Santos D, Brêda-Júnior MA, Ferraz EP, Crippa GE, de Oliveira FS, da Rocha-Barros VM. Study comparing midazolam and nitrous oxide in dental anxiety control. *J Craniofac Surg* 2013;**24**:1636–9.
6. Prado JM, Kurebayashi LFS, Silva MJP. Auriculotherapy effectiveness in the reduction of anxiety in nursing students. *Rev Esc Enferm USP* 2012;**46**:1200–6.
7. Wang SM, Kain ZN. Auricular acupuncture: a potential treatment for anxiety. *Anesth Analg* 2001;**92**:548–53.
8. 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. *J Altern Complement Med* 2010;**16**:1097–108.
9. Elder C, Ritenbaugh C, Aickin M, Hammerschlag R, Dworkin S, Mist S, Harris RE. Reductions in pain medication use associated with traditional Chinese medicine for chronic pain. *Perm J* 2012;**16**:18–23.
10. Hsu WH, Ho TJ, Huang CY, Ho HC, Liu YL, Liu HJ, Lai NS, Lin JG. Chinese medicine acupoint herbal patching for allergic rhinitis: a randomized controlled clinical trial. *Am J Chin Med* 2010;**38**:661–73.
11. Heyer G, Hornstein OP, Handwerker HO. Reactions to intradermally injected substance P and topically applied mustard oil in atopic dermatitis patients. *Acta Derm Venereol* 1991;**71**:291–5.
12. Ward L, Wright E, McMahon SB. A comparison of the effects of noxious and innocuous counterstimuli on experimentally induced itch and pain. *Pain* 1996;**64**:129–38.
13. Panahi Y, Ghanei M, Hajhashemi A, Sahebkar A. Effects of curcuminoids–piperine combination on systemic oxidative stress, clinical symptoms and quality of life in subjects with chronic pulmonary complications due to sulfur mustard: a randomized controlled trial. *J Diet Suppl* 2016;**13**:93–105.
14. Tian M, Hanley AB, Dodds MW, Yaegaki K. Chewing gum containing allyl isothiocyanate from mustard seed extract is effective in reducing volatile sulfur compounds responsible for oral malodor. *Am J Dent* 2013;**26**:180–4.

15. Gregersen NT, Belza A, Jensen MG, Ritz C, Bitz C, Hels O, Frandsen E, Mela DJ, Astrup A. Acute effects of mustard, horseradish, black pepper and ginger on energy expenditure, appetite, ad libitum energy intake and energy balance in human subjects. *Br J Nutr* 2013;**109**:556–63.
16. Tong Y, Yu Q, Leng Y. Hypotensive effects induced by herbal fomentation at Yongquan point. *J Acupunct Meridian Stud* 2012;**5**:305–9.
17. Alvira-González J, Figueiredo R, Valmaseda-Castellón E, Quesada-Gómez C, Gay-Escoda C. Predictive factors of difficulty in lower third molar extraction: a prospective cohort study. *Med Oral Patol Oral Cir Bucal* 2017;**22**:e108–14.
18. Corah NL. Development of a dental anxiety scale. *J Dent Res* 1969;**48**:596.
19. Smith T, Heaton L. Fear of dental care: are we making progress? *J Am Dent Assoc* 2003;**134**:1101–8.
20. Ritwik P, Cao LT, Curran R, Musselman RJ. Post-sedation events in children sedated for dental care. *Anesth Prog* 2013;**60**:54–9.
21. Michalek-Sauberer A, Gusenleitner E, Gleiss A, Tepper G, Deusch E. Auricular acupuncture effectively reduces state anxiety before dental treatment—a randomised controlled trial. *Clin Oral Investig* 2016;**16**:1517–22. http://dx.doi.org/10.1007/s00784-011-0662-4.
22. Karst M, Winterhalter M, Münte S, Francki B, Hondronikos A, Eckardt A, Hoy L, Buhck H, Bernateck M, Fink M. Auricular acupuncture for dental anxiety: a randomized controlled trial. *Anesth Analg* 2007;**104**:295–300.
23. Kuo SY, Tsai SH, Chen SL, Tzeng YL. Auricular acupressure relieves anxiety and fatigue, and reduces cortisol levels in post-caesarean section women: a single-blind, randomised controlled study. *Int J Nurs Stud* 2016;**53**:17–26.
24. Zhang CS, Yang AW, Zhang AL, May BH, Xue CC. Sham control methods used in ear-acupuncture/ear-acupressure randomized controlled trials: a systematic review. *J Altern Complement Med* 2016;**20**:147–61. http://dx.doi.org/10.1089/acm.2013.0238.
25. Hong YJ, Jang EH, Hwang J, Roh JH, Kwon M, Lee D, Lee JH. Effect of midazolam on memory during fiberoptic gastroscopy under conscious sedation. *Clin Neuropharmacol* 2015;**38**:47–51.

Address:
Andrea Gomes Dellovo
Oral Surgery and Anaesthesiology
Department of Dentistry
Federal University of Sergipe
St Cláudio Batista
Aracaju
Cidade Nova
Sergipe
Zip Code 49060-108
Brazil
Tel.: +55 079 99930 5302
E-mail: deadellovo@hotmail.com