



## Comparing the Effect of Hypnosis and Local Anesthesia Injection on Induction of Local Anesthesia, Anxiety, Hemorrhage and Pain Control during Tooth Extraction

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### ABSTRACT

There are cases in dentistry that despite the injection of local anesthesia, the desired numbness for tooth extraction can't be achieved or the use of common local anesthetic is contraindicated for the patient. Therefore, in these cases a complementary treatment can be introduced. The aim of this paper is to compare the effect of hypnosis and local anesthesia injection on induction of local anesthesia, anxiety, hemorrhage and pain control during tooth extraction. This randomized cross over trial research is carried out with 16 patients, with a mean age of 22 years and symmetric erupted third molars who were referred to the department of oral and maxillofacial surgery in Faculty of Dentistry of Rafsanjan University. For each patient the third molars on one side were extracted under hypnosis or local anesthesia and after a week on the opposite side under the other method. The Spielberger State Trait Anxiety Inventory was used to determine patients' anxiety level before and after hypnosis and injection. Pain was scored using VAS (Visual Analogue Scale) to measure hemorrhage volume. After surgery the patient was asked to bite a sterile gauze pad over the surgical site for 30 minutes and if the bleeding was more than slight ooze at, 12, 24 and 48 hours post operatively, they were supposed to mark it on the list. Data was analyzed using SPSS 19 statistical software. When local anesthesia was chosen the number of anesthesia cartridges used, anxiety level and pain intensity at 5 and 12 hours post operatively were higher than the time hypnosis was selected. ( $p < 0.050$ ). However, the maximum pain intensity during tooth extraction was much less when done under hypnosis rather than local anesthesia. ( $p < 0.001$ ). There was no significant difference between the two methods in terms of pain intensity and hemorrhage in 24 and 48 hours post operatively. ( $p > 0.050$ ). At clinical aspect, it seems the success of hypnosis in induction of anesthesia was less than injection and as mentioned above there was no significant difference between the two methods in terms of hemorrhage in 24 and 48 hours post operatively. The result of the study indicated that hypnosis can reduce anxiety and post-operatively pain.

**Key words:** Hypnosis, tooth extraction, local anesthesia, hemorrhage, anxiety phobia and pain.

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and the other is reaching a state called hypnosis ecstasy. Another definition for hypnosis is a condition of mind (or a supernatural condition) gained artificially and is mainly identified by exaggerated ecstasy.

### INTRODUCTION

Hypnotism is a branch of science aiming to help people's behavior and ability to comprehend via two factors. One is the use of rules of suggestibility

Hypnodontic is a branch of hypnotism which has achieved great significance these days and the use

of suggestibility and hypnosis induction for services in dentistry are discussed in it.

In case of teaching hypnotism correctly, great successes will be gained in dentistry especially in pediatric dentistry.

Those patients with dental problems not only doubt about visiting a dentist but also their fear and anxiety in the office makes any action impossible for the dentist. According to World Health Organization phobia is biggest barrier to development of dental health services to the world. The fear of needle is one of the largest parts of dentophobia [1]. Moreover, local anesthesia is effective to reduce the pain by itself however; it has no effect on anxiety control.

In some cases, despite of injecting local anesthesia for tooth extraction the aimed numbness can't be reached and even though the injection is repeated several times the patient still feels pain. In some other cases, the use of common local anesthesia is contraindicated for the patient. Therefore, in such cases, the use of a complementary treatment can be introduced. In addition, it's illustrated that hypnosis can reduce hemorrhage during surgery. As a whole, the use of hypnosis in dentistry for creating peace and making sure that patient follow dentist. Especially those who normally don't tend to do so, reducing anxiety and fear, making patients ready for regional or general anesthesia. It can also be used to control hemorrhage and saliva, making the anesthesia period last longer, making modeling easier when patient has nausea or vomiting. Helping the patient accept the dental prosthesis or orthodontic devices be placed in the mouth are other helps of hypnosis to dentistry.

Hypnosis in dentistry can be used as a supplementary method accompanied with other anesthetic medications. However, in case the patient is allergic to such medications, hypnosis can be used alone [13, 14]

In a research carried out in the endodontics department in Faculty of Dentistry, University of Pennsylvania, the clinical use of hypnosis and meditation was found out as is highly effective in controlling anxiety emerging from dental treatments.

In addition, among children aging 6 to 16 who visited a relaxing clinic in a dental hospital in New Castle, England, 20 of them were hypnotized that

16 of them could tolerate tooth extraction without local anesthesia injection [16].

Hermes & colleagues, carried out a research in 209 oral and maxillofacial surgeries done in a year with the combination of local anesthesia and hypnosis and the result illustrated that hypnosis can be a valid method and widely accepted by the patient. Also, in 93% of the cases noticeable improvements in treatments were made [17].

More & colleagues have carried out a research in 25 patients under hypnosis compared with 31 patients who weren't hypnotized. And the results indicated that hypnosis reduces anxiety of patients during operations [18].

Huet & colleagues were another group carrying out a research in 30 children being 5-12 years old and reported that anxiety in children who were hypnotized was remarkable reduced.

Although hypnosis is used in many cases in medicine and dentistry, many dentists still view it as a vague and mysterious method. Therefore, since hypnosis is ignored by dentists and patients this paper is to suggest dentists to use this method more often as a complementary or alternative way and in doing so this paper has compared the clinical effect of local anesthesia, hemorrhage, anxiety and pain control via hypnosis versus local anesthetic injection.

## MATERIAL AND METHODS

This research is carried out in form of clinical trial in 16 patients with symmetric erupted third molars who were referred to the department of oral and maxillofacial surgery in Faculty of Dentistry in Rafsanjan University. 6 of the patients (37.5%) were men and 10 (62.5%) were women with the mean age of 22. Demographic (age, gender and education) and systemic disease questionnaires were designed for each patient; the moral committee of the university had given the permission of the project beforehand.

The project was started with people of class I ASA [21]. Any patient with a systemic problem or allergic to medications was removed from the project. Also those patients having the history of drug addiction failed to continue the project, either. Also, patients ability to accept hypnosis as well as their reaction towards it were measured by Stanford Clinical Hypnosis Units for adults and

those who couldn't concentrate or accept hypnosis were the last group to be removed. Finally a panoramic radiography was taken from the patients to make sure the condition of third molars are similar in case of root and crown.

For each patient, in the first session, 3th molar was extracted via local anesthesia (lidocaine 2% accompanied by epinephrine 1:100000; Daroopaksh, Tehran, Iran) or after hypnosis by a professional practitioner holding an official degree of scientific association of Iran's clinical hypnosis. The operation was done by a maxillofacial surgeon and each patient was allowed to bring someone accompanying them during surgery. Next week, the second session was held and the opposing third molar of the same jaw was extracted with using the other method. (Either local anesthesia or hypnosis).

Hypnosis was done with one of the methods of staring at a point or Chaisson which are both appropriate for patients in dentistry [23-25]. Numbness was considered directly by pressing on the gum with elevator. If after injecting the first cartilage of lidocaine, the patient felt pain during tooth extraction other cartilages were injected and in the same condition hypnosis was tried and in case of failure continued with injection.

The Spielberger State Trete Anxiety Questionnaire was used to measure patient's anxiety level before and after injection as well as hypnosis [26].

To compare pain intensity VAS (Visual Analogue Scale) was used. During tooth extraction a constant observer –someone apart from the dental team- was present in both methods and marked the maximum score observed from patient's facial expressions on the diagram (objective). Moreover, the patients were asked to mark the pain intensity 5, 12, 24 and 48 hours post operatively from zero to ten in diagram (subjective). Also, patients were advised to use acetaminophen as a pain reliever if needed and note down the exact times taken. To measure hemorrhage patients were asked to bite a sterile gauze pad after the operation for 30 minutes over the surgical site and if the bleeding was more than slight ooze at 12, 24 and 48 hours post operatively, they were supposed to mark it on the list [27, 28].

Data was analyzed by statistical software SPSS version 19 after collection. To compare the

average anxiety level before tooth extraction sessions paired- *t*-test was utilized. In addition, crossover analysis was used to compare these variables during the project.

Moreover, to consider residual biological effects of used anesthetic methods to the last step significance carry-over effect was assessed [29].

In order to compare numbness and the hemorrhage volume and comparing frequency distribution of gender and education before the project and in every sessions in both methods two tests: McNemar's and Fisher's exact test were used. Significance level of tests was considered 0.05

## RESULTS

In this study 16 patients including 6 men (37.5%) and 10 women (62.5%) were participated. Average and standard deviation of participants' age was  $22.44 \pm 3.85$  patients were randomly divided to two groups. The first group were hypnotized in the 1<sup>st</sup> session and received anesthetic medication the 2<sup>nd</sup> session before tooth extraction while for the second group the 1<sup>st</sup> session was held with injecting local anesthesia and hypnosis was done in the 2<sup>nd</sup> session.

The results indicated that age and anxiety levels of two groups didn't have any significant differences with each other. ( $P > 0.050$ ) also frequency distribution of gender and education of two groups were mainly similar. ( $P > 0.050$ )

Statistics revealed that local anesthesia was more successful than hypnosis both in first and second session of tooth extraction ( $P = 0.007$  after first session and  $p = 0.001$  after second session of the project). However, in both sessions when hypnosis was selected not only the number of anesthetic cartilages were fewer than the time local anesthesia was chosen but also patients' anxiety was lower, comparatively. ( $p < 0.050$ ). Moreover, after the 1<sup>st</sup> session average pain intensity during tooth extraction under local anesthesia was significantly lower than hypnosis. ( $P = 0.06$ ) while this variable in the two positions mentioned above wasn't so varied in the second session of the project. ( $p = 0.059$ ) the other features such as maximum level of pain after 5, 12, 24 and 48 hours after tooth extraction, the amount and times of pain relievers used, and the hemorrhage volume in 5 and 12 hours after tooth extraction

were not much different between two groups both in the 1<sup>st</sup> and 2<sup>nd</sup> session. ( $p > 0.050$ )

Based on the cross over analysis, it's indicated that when local anesthesia was chosen the average number of cartilages used, anxiety level and pain intensity 5 and 12 hours after tooth extraction were significantly higher compared to hypnosis ( $P < 0.050$ ) while the average of highest pain intensity during tooth extraction when patients were under local anesthesia was significantly less than the time they were hypnotized. ( $P < 0.001$ ). Additionally, pain intensity in 24 and 48 hours after tooth extraction wasn't much different in both cases ( $P > 0.05$ ).

It is important to note that in this clinical trial research in order to see the carryover effect of the type of anesthesia method chosen these results were gained:  $t = 0.152$  and DF (degree of freedom) = 14;  $P = 0.882$  shows that carryover effect wasn't statistically significant. Therefore, it's concluded the methods used for anesthetic purposes didn't have a remaining effect on the patients' anxiety in the second session. In other words, the one week wash out period was sufficient to remove the effect of anesthesia.

## DISCUSSION

Since hypnosis is used to treat physical and mental diseases and is accepted as a complementary therapy. As a result, many studies have been made in it such as the use of hypnosis in dentistry.

In this research, all patients were hypnotized and three of them (18.8%) had their tooth extracted without any anesthetic cartilages injected since hypnosis itself provided desired numbness. However, hypnosis wasn't sufficient on its own for the rest thirteen members (81.3%) but the number of anesthetic cartilages used, had decreased greatly.

In a research carried out by Ataran & colleagues on patients needed root canal treatment, 16 out of 21 of the participants (76.2%) had gained desired numbness while other 5 participants (23.8%) didn't react properly. Their result may vary from the result of this paper due to the selection of a different treatment.

Lucas reported that hypnosis can decrease hemorrhage of hemophilia patients both during

and after surgery [32]. Also, Rapkin & colleagues hypnotized 15 people for a neck and head surgery and reported that hypnosis can decrease hemorrhage [33]. In a meta-analysis study done by Montgomery & colleagues done by Montgomery & colleagues to consider the effect of hypnosis on patients needing surgery and the results illustrated that 89% of the patients under hypnosis had improved conditions and lower hemorrhage volume. [34].

In the other hand, this paper revealed both methods didn't differ significantly in terms of the hemorrhage volume in 5, 12, 24 and 48 hours after tooth extraction, this result may be so due to having a small statistical sample or a varied treatment compared to those talked above.

Additionally, this paper illustrated that hypnosis can reduce patient's anxiety ( $P < 0.050$ ).

Moore & colleagues carried out a research on the effect of hypnosis on lowering anxiety emerging from surgery or pain of tooth extraction and the result revealed that hypnosis reduces patients' anxiety during dental operations [35].

Huet & colleagues have also reported that anxiety of hypnotized children have noticeably reduced [19]. Eitner & colleagues have hypnotized a very anxious and terribly afraid of dental operations and measured their blood pressure, heart rate and their cortisol level and reported that hypnosis can reduce anxiety of those patients who are very anxious [21].

Montgomery & colleagues research can also be noted when it comes to the effect of hypnosis on the pain of tooth extraction. Their project showed that hypnosis can reduce troubles caused by surgery and consumption of pain relievers [36]. Defechereux & colleagues also showed that in 197 thoracotomy cases hypnotized for anesthetic purposes, all patients felt significantly less pain after operation [36]. In the other hand, Lang & colleagues who carried out a research on 82 patients under aggressive treatments revealed that hypnosis has a significant effect to reduce pain [37].

The results of this research indicated that the maximum level of pain intensity is lower when tooth extraction operation is done under local

anesthesia rather than hypnosis while for the pain intensity 5 and 12 hours post operatively, it's vice versa.

Also pain intensity in 24 and 48 hours after the operation didn't vary greatly in two methods.

### CONCLUSION

This paper revealed that hypnosis can reduce anxiety out of dentophobia and also can reduce patients' pain after tooth extraction.

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