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Efficacy of Conversational Hypnosis and Propofol in Reducing Adverse Effects of Endoscopy

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Background: As pain and nausea is usually associated with endoscopy procedure, its management is important to alleviate patients' anxious in this regard.
Objectives: The present study aimed to examine the effectiveness of conversational hypnosis in reducing anxiety and endoscopy-related complications as well as its role in increasing the satisfaction of patients exposed to endoscopic procedures.
Patients and Methods: The participants of upper GI endoscopy procedure were randomly assigned to an experiment group (with conversational hypnosis intervention, n = 93) and a control group (n = 47). The participants' hemodynamic indexes (HR, blood pressure, pulse oximetry), anxiety, satisfaction level, and complications resulted from the procedure were monitored and included in the self-administered questionnaire.
Results: The results indicated that the participants in experiment group had a significant reduction of anxiety in the posttest. The adverse side effects such as vomiting, nausea, and hiccups in the experimental group was less than the control group, though this difference was not significant (P = 0.54).
Conclusions: The results suggested that conversational hypnosis technique could reduce anxiety as well as the sedation process in invasive procedures such as endoscopy.

Keywords: Hypnosis; Endoscopy; Propofol; Anxiety; Gastrointestinal Tract

1. Background

Endoscopy is a diagnostic method for the examining gastrointestinal tract problems. Because of the pain and nausea associated with this procedure, patients usually become considerably anxious. Therefore, a variety of sedative drugs are used to alleviate the pain in these patients (1). The sedatives used for endoscopy procedures not only have proved effective in reducing the discomfort and anxiety of the patients, but also h improved the results of endoscopy procedures, especially the interventional endoscopy (2).

Furthermore, a recent meta-analysis revealed that sedatives can win the approval of both patients and physicians. A variety of drugs have been used for this purpose (3). Propofol has been widely used recently due to its advantages such as reducing complications and recovery time over the other drugs like benzodiazepines and midazolam (4, 5). It is worth noting that an ideal premedication should not only alleviate patients' anxiety, but also increase their cooperation in a shorter period of time without any side effects. Today, many specialists claim that hypnosis can provide similar effects with regard to pain reduction. Therefore, a lot of efforts have been made to encourage the use of hypnosis in medical and surgical disorders in order to reduce pain and improve the healing process (6-9). Propofol has several disadvantages like hemodynamic changes (10). Thus, we need to find a method that lacks such shortcomings. As a result, this study aimed to speed up the treatment process by examining the role of conversational hypnosis in reducing anxiety and its consequent side effects.

2. Objectives

The present study seeks to examine the effectiveness of conversational hypnosis in reducing anxiety and endoscopy-related complications as well as its role in increasing the satisfaction of patients exposed to endoscopic procedures.

3. Patients and Methods

3.1. Subjects

Out of 200 patients sent to the endoscopy unit of Razavi hospital in Mashhad by gastroenterologists over a 4-month period (October to January 2013), 186 patients with the inclusion criteria were enrolled in the study. Based on the mean age and level of education (diploma, bachelor of science, master, or higher degrees), the patients were randomly assigned into experimental and control groups. A total of 46 participants in the control group were excluded since they refused to give us a final consent, although they signed a written consent form at the beginning. In the selection process, patients were first interviewed by a clinical psychologist, and those who met the requirements of the research were selected as the study sample. The inclusion criteria were having at least middle school education, the minimum age of 18 and the maximum age of 85, lacking any history of psychological problem, and submitting a consent form for participating in the study. The exclusion criterion was lack of willingness to participate in the study and using opioid and benzodiazepine agents.

3.2. Research Instrument

3.2.1. Self-administered Questionnaire

The self-administered questionnaire contained items on the demographic characteristics of the subjects. The information about the degree of pain and satisfaction from the procedure was collected based on a 10-point scale (10-point scale is scale for assessment of patient satisfaction and pain in which 0 indicates lower and 10 indicates best patient satisfaction). Furthermore, the patients were asked to answer questions about side effects of the procedure such as nausea, vomiting, and hiccups. Vital signs and hemodynamic indexes of the patients were also recorded at the beginning and end of the procedure.

3.2.2. Hamilton Anxiety Scale

This questionnaire was first designed by Max Hamilton between 1960 and 1967 as a clinical scale to assess the severity of a patient's anxiety. Hamilton's rating scale includes 14 items each with 5 rating. Depending on the severity of the symptoms, each group of symptoms is rated based on a scale of 0 to 4. Total score of the test indicates the level of anxiety. The minimum and the maximum scores were 4 and 56 for each item, respectively. However, there was no information on the score interpretation. Thus, this test sought to assess the change of patients' anxiety in the interval between the two tests. The reliability of this test was reported 81%, which was measured via retest by Haghshenas (11).

3.3. Method

The present study is a quasi-experimental research with pretest, posttest, and control group. It was open-label with simple randomization. After randomly assigning the patients in the control and experimental groups, a pretest was given to determine the patients' level of anxiety. Besides being sedated by propofol, the patients in the experimental group received conversational hypnosis as well. In both groups, at the beginning and the end of the procedure, vital signs such as systolic blood pressure, diastolic blood pressure, mean blood pressure, pulse oximetry, and the heart rate were recorded. Next, the related questionnaires of vital signs were collected. It is noteworthy that in both groups, the start and end time of sedation as well as the time required for patients to regain full consciousness were recorded by a stop watch.

The participants in both groups were sedated by propofol according to the standard protocols. Sedation was initiated by an anesthesiologist, using 30 - 50 mg of propofol until the desired level of sedation was achieved. Continuous infusions of 100 - 300 mg/h were also used.

The experimental group was sedated by propofol according to the above protocol and conversational hypnosis. Conversational hypnosis includes indirect suggestions, which are designed to mislead, confuse, or force a patient to think about the meaning of these indirect suggestions, the different possibilities, and how they are applied to them personally (12). We talked to the patients for about 5 to 10 minutes.

Conversational hypnosis, also known as covert hypnosis, is a way of communicating with patients' unconscious without informing them. In this approach, the hypnotherapist slowly sends hypnotic messages to the patient and reduces the patient's resistance to alter his/her thoughts, emotions, and beliefs. Conversational hypnosis is somehow similar to indirect hypnosis and Ericksonian approach to hypnosis. This approach includes subtle means of proposing via gaining rapport. In addition, it uses both verbal and non-verbal communication.

Initially, the hypnotherapist begins to build psychological bonds with the patient, and then he/she displays empathic behaviors such as confidence and understanding. The hypnotist then presents some metaphors to induce the desired meanings. Along with the presenting metaphors, the hypnotherapist tells the surface structure of meaning in the form of simple words such as novels, poems, and stories that activate an associated deep structure of meaning, which is indirectly relevant to the patient's problem. The hypnotherapist then builds an effective foundation over the patients' personality.

In practice conversational hypnotic suggestion is composed built on the base of patient's life experiences, his/her understanding, memories, and so on. Therefore, suggestions are provided case by case. Here is an example of a patient who liked licking ice cream in winter. After she lied on the endoscopy bed and before beginning of procedure, the hypnotist started talking to her.

"You told me about your pleasant experience of walk-

ing while snow is falling down…. . I can imagine your feeling when you saw snowy carpet under your steps and moony sky above your head… . That is such a beautiful and nice experience which you can feel lucky at this time. Often people enjoy playing on snow and making the snow ball or snow man… and you have this experience. You can recall your hands feel cool … .You can find this sense the same as enjoying ice cream … . You can recall the taste of ice cream … . Pleasant coolness, numbness, and anesthesia …. While you swallow that your pharynx and esophagus sense coolness and numbness, right like numbness of your hands when you were making snowman…, numbness changes to anesthesia as the ice cream is falling down and you remember snow falling down…, as ice cream goes down esophagus anesthesia becomes deeper".

Now the endoscopist begins his work.

"May you think how many persons have the chance of experiencing ice cream licking on snowy night? Think about that a few minutes …. How much tempreture do you want to be the night? Which one is more pleasant? … Swallowing of vanilla or chocolate ice cream? … Which one makes your esophagus cooler and more anesthetized? … Which one anesthetizes faster? … and which ones' anesthesia will last longer? … See, which part of your esophagus is more anesthetized, upper, middle, or lower zone?"

After ending the endoscopy procedure, suggestions continued as below.

"Now you have reviewed nice memories. Pleasure of doing what you like which you can keep them in your mind …. Your mind is a nice place for storing nice memories. They will remain in your mind unlike anesthesia feeling in your oropharyngoesophage, which will disappear after 30 or 40 minutes and you can select which one is better, 30 or 40? That is up to you".

3.3.1. Statistical Methods

The differences between two groups in terms of demographic variables and primary variables in the pretest were measured by independent t test and the Chi-square test. The covariance analysis (ANCOVAS) was used to measure the differences between the control and experiment groups with regard to changes in anxiety levels. Furthermore, a paired test was used to measure the extent of variation in the hemodynamic status of the patients, the beginning and final time of sedation and the time required for the patients to regain total consciousness. Finally, the Chi-square test was employed to compare the two groups in the terms of side effects, nausea, vomiting, and hiccups.

3.4. Ethical Considerations

This research proposal was approved by the ethics committee of Mashhad university of medical sciences, Iran, (permit No. 92/27520). Prior to the intervention, all patients participating in this study signed a written consent form.

4. Results

A total of 140 patients, who met the inclusion criteria, were randomly selected and divided into two experimental and control groups. More than 57% of the participants were women and 60% of the patients had no serious disease. There was no significant difference between the control and experiment groups in terms of demographic variables and clinical data (Tables 1 and 2).

The results of the independent t test showed that the two groups were not significantly different in terms of the time required to regain full consciousness (P = 0.37) and the ending time of sedation (P = 0.541). However, in the experiment group, the onset time of sedation after receiving anesthetic (mean = 28.39) was significantly lower than that of the control group (mean = 33.39) (P = 0.02).

In both groups, systolic and diastolic blood pressure improved significantly, but there was not any significant difference in the pulse oximetry and the heart rate of two groups before and after the procedure. The adverse side effects such as vomiting, nausea, and hiccups in the experiment group was less than the control group, though this difference was not significant (P = 0.54). In the experiment group, the pain score with a mean of 0.28 (± 0.89) was lower than that of the control group (0.49 ± 1.17), but this difference was not significant (P = 0.25). Also, the degree of satisfaction in the experiment group was higher than that of the control group. However, the difference was insignificant (P = 0.368).

The results suggested that the mean anxiety of the experimental group declined by about 5.72 in the period between pretest and posttest, while this reduction in the control group was only 4.93. Furthermore, the covariance analysis of the anxiety proved the significant effect of pretest. In other words, the pretest could influence the score of posttest (P = 0.004). F covariance analysis of two groups was significant at the level of 5%. Thus, the conversational hypnosis intervention was effective in reducing the anxiety of the patients undergoing endoscopy (Table 3).

Table 1. Results of the Chi-square Test Concerning the Comparison of Two Groups With Regard to Gender in the Pretest [a]

Variable	Level of Significance	Control Group (N = 47) [b]	Experiment Group (N = 93) [b]	Total = 140 [b]
Female	0.309	30 (21.4)	51 (36.4)	(57.8)81
Normal	0.545	33 (23.5)	51 (36.4)	84 (60)

[a] Finding that approach statistical significance depending on the P value: Significant at the P < 0.05 level.
[b] The values are presented as No. (%).

Table 2. Results of Independent T test Comparing Mean Age Scores, Vital Signs, and Level of Anxiety in Both Control and Experiment Groups in the Pretest [a,b]

Variable	Control Group (N = 47)	Experiment Group (N = 93)	Total (N = 140)	df	P Value
Age, y	54.89 ± 14.26	50.46 ± 13.12	51.95 ± 13.63	138	0.060
SBP, mm Hg	125.67 ± 26.79	125.4 ± 22.66	125.54 ± 23.86	118	0.970
DBP, mm Hg	74.47 ± 11.58	73.06 ± 13.16	73.48 ± 12.79	118	0.581
TBP, mm Hg	91.44 ± 20.37	91.11 ± 19.87	91.21 ± 19.93	114	0.935
PR. bpm	82.54 ± 14.16	84.91 ± 15.40	84.12 ± 14.99	136	0.383
SPO2, %	97.33 ± 4.95	98.25 ± 3.43	97.94 ± 4.00	137	0.203
Anxiety	7.40 ± 8.91	7.16 ± 7.45	7.24 ± 7.49	138	0.865

[a] Finding that approach statistical significance depending on the P value: Significant at the $P < 0.05$ level.
[b] The values are presented as mean ± SD.

Table 3. Results of Covariance on Comparing Level of Anxiety in Both Control and Experimental Groups [a]

Source of Variations	Sum of Squares	df	Mean Square	F	P Value
Pretest effect	55.040	1	55.040	8.77	0.004
Group	31.714	1	31.714	5.06	0.026
Error	859.520	137	06.274	--	--

[a] Finding that approach statistical significance depending on the P Value: Significant at the $P < 0.05$ level.

5. Discussion

The results suggest that conversational hypnosis intervention can reduce the anxiety of patients during invasive procedures such as endoscopy. This finding is consistent with the study of Abdeshahi (13), which reported the effective role of hypnosis techniques in reducing pain and anxiety. A meta-analysis of 18 published studies in 2000 showed that 75% of clinical and experimental participants with different types of pain obtained substantial pain relief from hypnotic techniques (14). In addition, the intervention reduces the time required for sedation with fewer side effects such as nausea, vomiting, and hiccups, though these differences are trivial.

Cavallo's study on the comparison of the role of hypnosis and diazepam in the sedation of patients undergoing endoscopic procedures revealed that both groups were similar in terms of salivation and vomiting, but patients under hypnosis required shorter time to regain full consciousness (15). In our study, the time required to regain full consciousness was not significantly different between both groups. The reason may be related to the use of hypnosis along with a sedative medication in our study, which affected the time.

The study of Schulz (16) also confirms the findings of our study. He showed that hypnosis could be an effective method to prepare patients for the surgery or other invasive procedures without any serious side effect. Consistent with the literature, the results of the present study suggest that hypnosis can be an effective method for reducing the pain and anxiety of patients before operations or other invasive procedures, which can also help them relax during the procedure.

Thus, it can be concluded that hypnosis can be used with anesthetic drugs, especially in patients with kidney, heart, or liver problems who are banned from using anesthetics (17, 18). Since there are various means for measuring anxiety, it is recommended that a different anxiety scale be used in future studies.

The two groups were not significantly different with respect to hemodynamic changes and pain and side effects which may be due to small sample size. Therefore, conducting further studies in this field are recommended.

The results of this study indicate that the use of conversational hypnosis techniques could reduce the anxiety of patients and speed up sedation in invasive procedures such as endoscopy. Overall, hypnosis has been used as a treatment for medical and psychological disorders for many years; however, we are still in need of a comprehensive theory and should conduct further research.

Authors' Contributions

Mehdi Fathi, Azra Izanloo, and Alireza Hashemian designed the project and supervised the study. Mehdi Fathi and Azra Izanloo wrote the manuscript. Kamran Ghaffarzadehgan and Sayyed Majid Sadrzadeh edited the manuscript. Azra Izanloo performed data analysis. Sara Izanloo, Hassan Vosooghinia, and Alireza Hashemian conducted the study.

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