

# AN EVALUATION OF THE EFFECT OF HYPNOSIS ON POSTOPERATIVE ANALGESIA FOLLOWING LAPAROSCOPIC CHOLECYSTECTOMY

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**Abstract:** Little attention has been paid to the effectiveness of hypnosis in improving the results of surgery in Iran. One hundred and twenty patients scheduled for laparoscopic cholecystectomy were randomly divided into either control (standard care) or experimental (hypnosis) groups. Prior to surgery and again after surgery, abdominal pain, nausea, and vomiting were assessed. The results suggest that hypnosis could effectively reduce pain after laparoscopic cholecystectomy and significantly reduce hospitalization time.

Surgery, as a medical procedure that is performed in most hospitals, could be a multilevel stressor for patients (Salmon, 2000), and perioperative pain usually causes considerable distress and suffering in patient. This is a factor that is closely associated with disturbed recovery after the surgery (Mavros et al., 2011).

Preoperative emotional distress predicts the consumptions of pain medication (Ip, Abrishami, Peng, Wong, & Chung, 2009) with the appearance of postoperative pain for any reason being one of the main problems for patients, which can cause unexpected side effects. Thus, it is very important to control such pains, and something that presents great challenges to surgeons and anesthesiologists.

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As medical staff know, all medications used for controlling patients' pain in surgeries have some disadvantages, including side effects and extra cost for recovery and hospitalization whereas hypnosis offers an alternative through autosuggestions and other suggestive techniques that can help alleviate stress and pain and reach relaxation (Hermes, Truebger, Hakim, & Sieg, 2005).

Today, psychological interventions such as cognitive behavioral techniques, mental training, and relaxation are undertaken to reduce anxiety, emotional disorders and pain in surgery patients.

In addition, hypnosis has a longstanding tradition of reducing pain and distress in many clinical randomized trials (Flory, Salazar, & Lang, 2007), and, for hundreds of years, it has been effective in alleviating the suffering and anxiety of patients (Nusbaum et al., 2011). The anesthetic and analgesic effects of hypnosis can be used via visual suggestions to generate muscle relaxation and perception-related changes aimed at reducing pain (Brenda et al., 2009).

Accordingly, this study seeks to evaluate the effects of hypnosis in reducing pain, nausea, and vomiting as well as the intake of analgesics after laparoscopic cholecystectomy.

## METHODS

Given the sample size (120 participants) estimated by NCSS & PASS statistical software and considering the minimum power of 80% for the chi-square test, the effect size ( $W = 0.2520$ ) (Dufresne et al., 2010) and the error rate of 5% was estimated. The patients who have scheduled for elective laparoscopic cholecystectomy surgery with American Society of Anesthesiologists (ASA) I, II, in the period between October 2012 and July 2013, and aged between 30 and 60 years were selected.

The night before surgery, the patients were visited by an anesthesiologist and a psychiatrist. The anesthesiologist examined the patient's general condition and special anesthesia-related considerations before the surgery and the psychiatrist examined the absence of any psychiatric or psychological disorders that could interfere with hypnosis by conducting an initial interview with the patient. The patients who had a history of mood disorders, psychopathology, psychoactive drugs, or drug abuse were excluded from the study.

Patients were randomly divided into experimental and control groups. Cardiovascular and pulse oximetry monitoring was established. Hypnotic suggestions were provided by an audio recording containing hypnotic verbal suggestions followed by conditioning suggestions for postoperative analgesia.

Hypnotic induction was referred to as a "naturalistic approach." In this technique, verbal suggestions guided imagination when

concentrated on walking around a known garden (to facilitate patient dissociation from the operation room).

You are now walking in a known beautiful garden . . . , you can see the tall trees all around and red roses on the left side . . . and butterflies on them . . . Also you are hearing the song of birds on trees . . . and enjoy of a waterfall music that comes from distance . . . Look to the blue sky . . . , take a deep breath and let your body relax, and when exhale feel the freedom . . . That's OK . . . very nice . . . everything is ready for you to enjoy.

Then suggestions were guided to deepening of induction:

While you are looking at the trees, hearing the birds' song and feeling the fresh air go deeper and relax . . . so deep and so relaxed . . . deeper . . . and more relaxed . . . that's good . . . you are right . . . you will feel more relaxed . . . and you will see yourself with who you love, him or her. That's good . . . you will keep your hands lovely . . . and walk through the attractive, simple maze of trees . . . and your relaxation will deepen as you walk and smell the beautiful flowers.

[Placing a beloved person in the imagination was done to enhance patient confidence.]

Dissociative imaginations were presented for all of the time of surgery (average time of surgeries was 15 minutes).

Then suggestions were guided to postoperative analgesia:

Now it's time for you leave the garden . . . You will be able to recall the pleasant memories from this brief trip . . . You will be completely mentally relaxed, without tension, anxiety or pain . . . on your bed at the hospital you will find yourself relaxed, experiencing no pain, no nausea and no distress . . . You can recall your memories in the garden if needed . . . Of course it will be just as enjoyable as when you heard this recorded voice.

Now you can count from 10 to one, and when you reach one you will open your eyes and enjoy the hospital stay, fully relaxed and without pain or nausea.

Then general anesthesia was induced by fentanyl 4mic/kg, midazolam 2 mg, propofol 2 mg/kg, and atracurium 0.5 mg/kg and the maintenance of anesthesia was done by continuing the infusion of 50–100 mic/kg/min propofol. Bi-Spectral Index (BIS) monitoring was applied for monitoring the depth of the anesthesia, which kept 40–60. Postoperative analgesics were prescribed in accordance with the protocols set out by the general surgery ward for both groups, protocol included acetaminophen codeine for the visual analogue scale (VAS) less than five and pethidine 15 mg for VAS equal/above five. After extubation and when patients went through the recovery room and gained full consciousness in the general surgery ward, their pain, nausea, and vomiting were measured according to VAS indexes 2, 6, 12, and 24 hours

after the surgery, noted on the checklist by the anesthetic assistant. The consumption of narcotic and nonnarcotic analgesics, the recovery time, the hospital stay length, the period of sedative consumption, and the occurrence of nausea and vomiting were also recorded for both groups.

After data collection and initial processing, observations were recorded in the SPSS software and explained by descriptive statistics methods such as the indexes of central tendency and dispersion.

To examine research objectives and hypotheses, first the descriptive methods and Kolmogorov-Smirnov test were used to check the normality of the data and then chi-square and student *t* tests were applied to both independent and Mann-Whitney groups.

This research proposal was approved by the ethics committee of Mashhad University of Medical Sciences (No. 910724).

## RESULTS

In this study, 120 patients, who qualified with the inclusion criteria, were randomly divided into two control and experimental groups. More than 13% of the patients were male and over 86% of them were women. The gender distribution in the two groups was compared by a chi-square test with the results showing no significant difference between the two groups ( $p = .591$ ). The age distribution of patients in the control and hypnosis groups was  $43.10 \pm 14.40$  and  $43.15 \pm 9.43$ , respectively, and the results of student *t* test did not show any significant difference between the two groups ( $p = .801$ ). The mean weights of the patients in the control and hypnosis groups were  $70.48 \pm 14.93$  and  $68.35 \pm 7.48$ , respectively, and the results of the Mann-Whitney test concerning the comparison of two groups did not show any difference ( $p = .211$ ).

As shown in Table 1, the results of the chi-square test showed a significant difference between the hypnosis and control groups in terms of abdominal pain at different times with the patients in hypnosis group having lower abdominal pain compared to the control group at all times.

Table 1

*The Results of Chi-Square Test Comparing the Hypnosis and Control Groups in Terms of Postoperative Abdominal Pain*

The intensity of abdominal pain in . . .	<i>p</i> Value
Recovery	.005
2 hours after surgery	.005
6 hours after surgery	.003
12 hours after surgery	.001
24 hours after surgery	.001

Table 2

*The Results of Chi-Square Test Comparing the Two Hypnosis and Control Groups in Terms of Nausea and Vomiting After Surgery*

Variable	<i>p</i> Value 24 hours after surgery	<i>p</i> Value 12 hours after surgery	<i>p</i> Value 6 hours after surgery	<i>p</i> Value 2 hours after surgery	<i>p</i> Value during recovery time
Nausea intensity	.058	.686	.534	.361	.608
Vomiting intensity	1	1	1	.762	.439

The results of comparing postoperative nausea and vomiting at different times in the two groups are presented in Table 2, which indicate the lack of any significant difference between the two groups in terms of the intensity of nausea and vomiting.

The highest frequency of nausea intensity belonged to the "no nausea" category and most patients had none or slight vomiting after the surgery.

The results showed that the mean doses of narcotic analgesics in the hypnosis and control groups were  $9.41 \pm 12.89$  and  $15.75 \pm 13.14$ , respectively. A Mann Whitney *U* test showed that there was a significant difference between the two groups in terms of the mean dose of narcotic analgesics with the hypnosis group showing a declining trend ( $p < .05$ ). However, there was no significant difference between the two groups with respect to the consumption of nonnarcotic analgesics dose ( $p = .08$ ).

Overall, the mean time for taking the first dose of sedatives was  $2.26 \pm 1.48$  in the hypnosis group and  $1.33 \pm 1.48$  in the control group, which showed a significant difference between the two groups ( $p = .0001$ ).

The recovery time for the patients in the hypnosis group was 25 minutes less than that of the control group; however, this difference was not significant ( $p = .909$ ). However, the hospitalization times for the hypnosis and control groups were  $29.20 \pm 1.9$  hours and  $36.40 \pm 14.97$  hours, respectively, which showed a significant difference between the two groups ( $p = .003$ ). The hospitalization period was lower for the hypnosis group.

## DISCUSSION

The results showed that hypnotic intervention can alleviate the intensity of abdominal pain and the dose of narcotic analgesics in patients undergoing elective laparoscopic cholecystectomy surgery. It is

consistent with the meta-analysis of Montgomery et al. (2007) that confirmed the effectiveness of hypnosis in surgical complications such as pain and the consumption of painkillers.

In the same study, shorter recovery time was also presented as one of the results of hypnosis. Although, in our study, the shorter recovery time was observed in the hypnosis group, this reduction was insignificant, which could be caused by factors like small sample size or differences in the use of anesthetic drugs and their dosage, which need to be homogenized in a condition to ensure the validity of study results.

In line with the results of our study concerning the shorter recovery time, the results of a meta-analysis by Tefikow et al. (2013) indicated that hypnosis had low-to-medium effects on reducing the recovery time.

The clinical randomized trials of Lang et al. (2000) and Montgomery et al. (2007) and the meta-analysis of Montgomery, David, Winkel, Silverstein, and Bovbjerg (2002), Montgomery (2002), and Schnur, Kafer, Marcus, and Montgomery (2008) showed that hypnosis was an effective intervention in controlling the postoperative medical complications such as pain, nausea, and vomiting whereas, in our study, there was no significant difference between the two groups in terms of the intensity of nausea or vomiting, which can be explained by the small sample size.

Overall, the results of this study suggest that hypnotic suggestions before surgery could be an adjuvant therapy with ordinary care for alleviating pain and the consumption of sedative drugs in patients undergoing laparoscopic cholecystectomy.

## CONCLUSIONS

The results of the present study showed the effectiveness of hypnosis in alleviating pain after laparoscopic cholecystectomy and as a supplement in reducing the consumption of narcotic analgesics. Overall, it seems that, although hypnosis has been used as an adjuvant therapy for many years, further research in this field is required to achieve a definitive and comprehensive theory.

## REFERENCES

- Brenda, L., Stoelb, B. L., Ivan, R., Molton, I. R., Mark, P. (2009). Efficacy of hypnotic analgesia in adults: A review of the literature. *Contemporary Hypnosis*, 26, 24–39. doi:10.1002/ch.370
- Dufresne, A., Rainville, P., Dodin, S., Barre, P., Masse, B., Verreault, R., & Marc, I. (2010). Hypnotizability and opinions about hypnosis in a clinical trial for the hypnotic control of pain and anxiety during pregnancy termination. *International Journal of Clinical Experimental Hypnosis*, 58, 82–101. doi:10.1080/00207140903310865

- Flory, N., Salazar, G. M., & Lang, E. V. (2007). Hypnosis for acute distress management during medical procedures. *International Journal of Clinical and Experimental Hypnosis*, 55, 303–317. doi:10.1080/00207140701338670
- Hermes, D., Truebger, D., Hakim, S. G., & Sieg, P. (2005). Tape recorded hypnosis in oral maxillofacial surgery-basics and first clinical experience. *Journal of Cranio-Maxillofacial Surgery*, 33, 123–129. doi:10.1016/j.jcms.2004.06.009
- Ip, H. Y., Abrishami, A., Peng, P. W., Wong, J., & Chung, F. (2009). Predictors of postoperative pain and analgesic consumption: A qualitative systematic review. *Anesthesiology*, 111, 657–677. doi:10.1097/ALN.0b013e3181aae87a
- Lang, E. V., Benotsch, E. G., Fick, L. J., Lutgendorf, S., Berbaum, M. L., Berbaum, K. S., . . . Spiegel, D. (2000). Adjunctive non-pharmacological analgesia for invasive medical procedures: A randomised trial. *The Lancet*, 355, 1486–1490. doi:10.1016/S0140-6736(00)02162-0
- Mavros, M. N., Athanasiou, S., Gkegkes, I. D., Polyzos, K. A., Peppas, G., & Falagas, M. E. (2011). Do psychological variables affect early surgical recovery? *PLoS One*, 6, 5, e20306. doi:10.1371/journal.pone.0020306
- Montgomery, G. H., Bovbjerg, D. H., Schnur, J. B., David, D., Goldfarb, A., & Wertz, C. R. (2007). A randomized clinical trial of a brief hypnosis intervention to control side effects in breast surgery patients. *Journal of the National Cancer Institute*, 99, 1304–1312. doi:10.1093/jnci/djm106
- Montgomery, G. H., David, D., Winkel, G., Silverstein, J. H., & Bovbjerg, D. H. (2002). The effectiveness of adjunctive hypnosis with surgical patients: A meta-analysis. *Anesthesia and Analgesia*, 94, 1639–1645.
- Nusbaum, F., Redouté, J., Le Bars, D., Volckmann, P., Simon, F., & Hannoun, S. (2011). Sappey-Marinier D Chronic low-back pain modulation is enhanced by hypnotic analgesic suggestion by recruiting an emotional network: A PET imaging study. *International Journal of Clinical Experimental Hypnosis*, 59, 27–44. doi:10.1080/00207144.2011.522874
- Salmon, P. (2000). *Psychology of medicine and surgery: A guide for psychologists, counsellors, nurses and doctors*. Chichester, UK: Wiley.
- Schnur, J. B., Kafer, I., Marcus, C., & Montgomery, G. H. (2008). Hypnosis to manage distress related to medical procedures: A meta-analysis. *Contemporary Hypnosis*, 25(3–4), 114–128. doi:10.1002/ch.v25:3/4
- Tefikow, S., Barth, J., Maichrowitz, S., Beelmann, A., Strauss, B., & Rosendahl, J. (2013). Efficacy of hypnosis in adults undergoing surgery or medical procedures: A meta-analysis of randomized controlled trials. *Clinical Psychology Review*, 33, 623–636. doi:10.1016/j.cpr.2013.03.005

### Eine Einschätzung des Effektes von Hypnose auf postoperative Analgesie nach laparoskopischer Cholezystektomie

Marjan Joudi, Mehdi Fathi, Azra Izanloo, Omid Montazeri, und Ali Jangjoo  
 Abstract: Der Effizienz von Hypnose in bezug auf die Verbesserung der Ergebnisse von Operationen im Iran wurde wenig Aufmerksamkeit geschenkt. 120 Patienten, die sich einer laparoskopischen Cholezystektomie unterzogen, wurden wahllos in eine Kontrollgruppe (Standardbehandlung) und eine experimentelle (Hypnose) Gruppe eingeteilt. Vor und nach der Operation wurden Bauchschmerzen, Übelkeit und Erbrechen bewertet. Die Ergebnisse legen nahe, daß Hypnose Schmerzen nach einer laparoskopischen Cholezystektomie effektiv reduzieren und die Hospitalisationszeit signifikant verkürzen könnte.

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Une évaluation de l'effet de l'hypnose sur l'analgésie postopératoire après  
une cholécystectomie laparoscopique

Marjan Joudi, Mehdi Fathi, Azra Izanloo, Omid Montazeri et Ali Jangjoo  
Résumé: Peu d'attention a été accordée à l'efficacité de l'hypnose dans  
l'amélioration des résultats de la chirurgie en Iran. Cent vingt patients en  
attente d'une cholécystectomie laparoscopique ont été répartis aléatoirement  
en deux groupes: le groupe témoin (soins courants) et le groupe expérimental  
(hypnose). L'intensité des douleurs abdominales, nausées ou vomissements  
a été évaluée avant et après l'opération. Les résultats indiquent que l'hypnose  
pourrait réduire efficacement les douleurs à la suite d'une cholécystectomie  
laparoscopique et raccourcir considérablement la durée d'hospitalisation.

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Evaluación del efecto de la hipnosis en la analgesia postoperatoria de una  
colecistectomía laparoscópica

Marjan Joudi, Mehdi Fathi, Azra Izanloo, Omid Montazeri y Ali Jangjoo  
Resumen: Se ha prestado poca atención a la eficacia de la hipnosis en la  
mejora de resultados de cirugía en Irán. Se dividió aleatoriamente a ciento  
veinte pacientes programados para colecistectomía laparoscópica en gru-  
pos control (atención estándar) o experimental (hipnosis). Antes y después  
de cirugía se evaluó dolor abdominal, náusea y vómito. Los resultados  
sugieren que la hipnosis podría reducir eficazmente el dolor después de  
una colecistectomía laparoscópica y reducir significativamente el tiempo de  
hospitalización.

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