Listening to music decreases need for sedative medication during colonoscopy: a randomized, controlled trial

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Background: Music played during endoscopic procedures may alleviate anxiety and improve patient acceptance of the procedure. A prospective randomized, controlled trial was undertaken to determine whether music decreases the requirement for midazolam during colonoscopy and makes the procedure more comfortable and acceptable. Methods: Patients undergoing elective colonoscopy between October 2003 and February 2004 were randomized to either not listen to music (Group 1; n=40) or listen to music of their choice (Group 2; n=38) during the procedure. All patients received intravenous midazolam on demand in aliquots of 2 mg each. The dose of midazolam, duration of procedure, recovery time, pain and discomfort scores, and willingness to undergo a repeat procedure using the same sedation protocol were compared. Results: Patients in Group 2 received significantly less midazolam than those in Group 1 (p=0.007). The pain score was similar in the two groups, whereas discomfort score was lower in Group 2 (p=0.001). Patients in the two groups were equally likely to be willing for a repeat procedure. Conclusion: Listening to music during colonoscopy helps reduce the dose of sedative medications and decreases discomfort experienced during the procedure. [Indian J Gastroenterol 2006;25:3-5]

Use of music to promote relaxation has a long history in medicine. Ancient Indian treatises like Samaveda refer to the therapeutic utility of music. Role of music as an adjunct to standard treatment has been studied in several disorders. Some studies suggest that music alleviates anxiety and improves patient tolerance during gastrointestinal (GI) endoscopy.

This randomized, controlled trial was designed to determine whether music could help decrease the need for midazolam during colonoscopy and improve the acceptability of this procedure by patients.

Methods
Between October 2003 and February 2004, 78 patients scheduled for elective colonoscopy agreed to participate in the study. Patients aged below 15 or above 60 years, those hard of hearing due to any cause, patients with overt or borderline psychiatric illness, and those with considerable cardiopulmonary morbidity were excluded. Patients were allocated into two groups using computer-generated random numbers.

Patients in both Group 1 (n=40) and Group 2 (n=38) received 2 mg intravenous boluses of midazolam on demand; no dose was given when the procedure was begun. Patients in Group 2 were in addition allowed to listen to music of their choice from among six types – popular film songs based on carnatic classical ragas, classical music, devotional songs, folk songs, soft instrumental music, and bioacoustics. Bioacoustics is a soothing admixture of soft instrumental music along with nature sounds. Music was played using a Walkman (Sony, Japan) and headphones. Patients in Group 1 had headphones placed over their ears but no music was played. Randomization and placement of headphones were done by a trainee physician who was not involved in further evaluation.

Colonoscopic examinations were performed by endoscopists with experience of performing at least 200 full-length colonoscopic procedures. During the procedure the pulse rate and systolic (SBP) and diastolic (DBP) blood pressure were monitored using an electronic wristwatch blood pressure recorder (NAIS Blood Pressure Watch; Matsushita, Tokyo, Japan). After the procedure, patients were monitored in the recovery room.

Outcome measures included dose of midazolam, duration of procedure, recovery time, pain score, discomfort score, and willingness to undergo the procedure under the same sedation protocol. In addition, occurrence of hypertension (defined as SBP >140 mmHg or DBP >90 mmHg or both), hypotension (SBP <90 mmHg), tachycardia (heart rate >100/min) and bradycardia (heart rate <60/min) were recorded.

Recovery time was defined as the time until the patient was oriented in time, place and person and was able to serially subtract 6 from 100, which was...
assessed by the recovery-room nurse who was unaware of the group allocation. Pain and discomfort scores were assessed using 0-10 visual analog scales (0: none, 10: extreme pain or discomfort).

The study protocol was approved by the ethics committee of our hospital. All patients provided written informed consent. The sample size was estimated based on a pilot study that included 20 patients; it was calculated that at least 40 patients were needed in each limb of the study to detect a 25% reduction in the dose of sedative medication with p value of 0.05 and study power of 80%.

Statistical analysis

Intergroup comparison was done using the non-parametric Mann-Whitney U test. The results are expressed as median and range.

Results

Patients in the two groups were comparable in age, gender distribution, and educational and social status. Most (n=75) underwent diagnostic colonoscopy for various indications (Table 1); three (control group - 1, music group - 2) underwent polypectomy. The endoscope was advanced up to the cecum in 69 cases. Three patients (control group - 2, music group - 1) had malignant strictures that precluded full examination. The procedures had to be abandoned midway due to extreme non-cooperation from three patients (control group - 1, music group - 2); all three had irritable bowel syndrome with recent change in pattern of symptoms. Three patients who underwent polypectomy had previously undergone full-length colonoscopy.

Most patients opted for popular film songs (n=26), followed by bioacoustics (n=18), soft instrumentals (n=8), folk songs (n=16), classical music (n=5) and devotional songs (n=5). The proportions of patients developing tachycardia (Group 1 - 57.9% vs. Group 2 - 55%), bradycardia (Group 1 - 12.8% vs. Group 2 - 14.3%), hypertension (Group 1 - 13.1% vs. Group 2 - 15.4%) and hypotension (Group 1 - 7.3% vs. Group 2 - 5.8%) were comparable in the two groups. The mean pain scores were similar in the two groups (p=0.128) while the mean discomfort score was higher in Group 1 (p=0.001) (Table 2). There was no difference in the duration of procedure between the two groups, whereas recovery time was longer in Group 1 (Table 2). Group 1 patients received a higher dose of midazolam than those in Group 2 (Table 2). Equal proportions of patients in the two groups were willing to undergo repeat procedure using the same sedation protocol (21 in group 1, 17 in group 2).

Discussion

Colonoscopy is an uncomfortable and painful endoscopic procedure. Administration of sedatives and analgesics during colonoscopy carries the risk of arterial hypotension and respiratory depression. Most centers administer small doses of mild short-acting sedatives like midazolam. In our study, a reduction in the dose of midazolam was noted in the music group. Although pain scores were not significantly different between the groups, discomfort scores were less in the music group.

Beneficial effects of music therapy have been recognized previously. Music has positive psychological and physiological effects; hence it has been used for relieving stress associated with medical procedures and interventions. In particular, Palakanis et al and Bampton found that music alleviated anxiety and improved patient tolerance during GI endoscopy. Unfortunately, most studies on the effect of music during GI endoscopy had shortcomings like small sample sizes, non-random allocation, lack of observer blinding and assessment of subjective parameters. Moreover, many studies used investigator-selected music; in view of individual preferences in perception of music, use of patient-selected music may be more apt. Our study avoided several of these pitfalls.

In our study, a reduction in the dose of midazolam was noted in the music group. It may be argued that this could partly be due to the ‘Hawthorne effect’ (special interest that the investigator takes on the
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treatment arm), but chances of this are less since the endoscopist who makes the decision on administering sedative medication in conjunction with the patient’s request was blinded. Although pain scores were not significantly different between the groups, discomfort scores were found to be less in the music group. Chances of bias playing a role in this final assessment are unlikely since the final assessor (recovery-room nurse) was also blinded to which study limb the patient belonged to.

The neurobiological basis of the effect of music on patient tolerance of GI endoscopic procedures remains unclear, although a recent trial showed reduction in salivary cortisol level when music was played during colonoscopic examination.12

In conclusion, our study showed that music can decrease the dose requirement of sedative medication for colonoscopy and reduce patient discomfort. Since it is readily available, noninvasive and without any side effects, music may be recommended as an adjunct to sedatives for patients undergoing elective colonoscopy.

References

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