



EFFECT OF PREMEDICATION OF N-ACETYLCYSTEINE AND SIMETHICONE TO IMPROVE VISUALISATION DURING UPPER GI SCOPY: A COMPARATIVE STUDY OF 50 CASES

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ABSTRACT

Upper gastrointestinal (GI) endoscopy is the investigation of choice for diagnosis of diseases and involves direct visualisation. However, the diagnostic accuracy may be compromised by the inadequate visualisation due to foams and bubbles. Therefore, the present study was conducted to evaluate the effectiveness of N-acetylcysteine (NAC) and Simethicone in improving the visibility during upper GI endoscopy. A total of 50 patients undergoing upper GI endoscopy and meeting the inclusion and exclusion criteria were included after obtaining approval from the Institutional Ethics Committee and written informed consent from all the participants. Demographic details and histories were recorded. The patients were randomized into two Groups: A (No pre-treatment) and B (Pre-treatment with N-acetylcysteine and Simethicone). The mucosal layer visibility during upper GI endoscopy in both the Groups were recorded and compared. It was observed that the two Groups were similar in terms of demographic variables. The mucosal visibility score (MVS) was better in Group B as compared to Group A (P value: less than 0.001). It may be effectively concluded that the pre-treatment with NAC and Simethicone significantly improves the visibility during upper GI endoscopy.

KEYWORDS

Mucosal visibility, N-acetyl cysteines, Simethicone, Upper GI endoscopy.

INTRODUCTION

Upper gastrointestinal (GI) endoscopy is the diagnostic method of choice for diseases of esophagus, stomach and duodenum.^{1,2} It involves direct visualisation of the lesions. However, several factors may obscure the visual field and limit the accuracy of the diagnosis. Foams, bubbles and mucus are frequently encountered.^{3,4} In addition to limiting the diagnostic accuracy, they also contribute to the significant increase in the procedure time, thus, compromising the comfort of the patient as well.⁵ Therefore, there has been search for drugs which can reduce these factors and increase the visibility during the procedure. Two such agents are Simethicone and N-acetylcysteine (NAC).

Simethicone, a combination of polydimethylsiloxane and silicone dioxide, is an antifoaming agent⁶ while NAC is a mucolytic agent.⁷ They act by decreasing the surface tension which helps in thinning of mucus and removal of foams and bubbles.⁸ This, in turn, improves the mucosal layer visibility. Some studies have been conducted in other countries highlighting their usefulness as a premedication, but studies in Indian population are scarce. Therefore, the present study was conducted to assess the usefulness of NAC and Simethicone as a premedication for improvement in the visibility during upper GI endoscopy in Indian population.

MATERIALS AND METHOD

This randomized controlled trial was conducted under the Department of Surgery, MGM Medical College and Hospital, Kamothe, Navi Mumbai, from March 2023 to August 2023, following approval from the Institutional Ethics Committee.

A total of 50 patients of either gender aged more than 18 years, planned for upper GI endoscopy and consenting to participate in the study were included. Patients allergic to any of the study drugs, having gastric outlet obstruction, given hyoscine premedication, having history of gastric surgery or not giving consent to participate in the study were excluded. Pregnant patients were also excluded from the study. A written informed consent was obtained from all the patients.

Demographic details of the patients were recorded. History of present illness and detailed past and personal histories were noted. The patients were randomized into two Groups: Group A (No pre-treatment) and Group B (Pre-treatment with NAC and Simethicone) and waited for 5 minutes. Upper GI endoscopy was done.

The Mucosal Visibility Score (MVS) was calculated for all the patients as follows:

Score 1: No adherent mucous on gastric surface;
Score 2: A small amount of gastric mucous without obscuring vision;
Score 3: A large amount of gastric mucous, which took less than 50 ml of water to clear; and
Score 4: A large amount of mucus on gastric mucous, which took more than 50 ml of water to clear out

All the data was analysed using Statistical Package for Social Sciences (SPSS). P value of less than 0.05 was considered significant and indicated by “*” in the Tables.

RESULTS

The two Groups were similar in terms of age (mean age of Group A: 44.52 ± 19.00 years and Group B: 45.36 ± 20.59 years; P value: 0.881) and gender distribution (P value: 0.747). There was a male preponderance in the study group (74%).

The MVS score was significantly lower in the cases pre-treated with NAC and Simethicone (Group B) than those without pre-treatment (Group A) (Table 1).

Table 1: Distribution of the MVS in the two Groups

PARAMETER	GROUP A	GROUP B	P VALUE
MVS	2.56 ± 0.77	1.28 ± 0.54	<0.001*

There were no adverse effects in any patient.

DISCUSSION

In the present study, both the Groups were similar in terms of baseline demographic characteristics. It was observed that the MVS was significantly better in the patients with premedication with Simethicone and NAC.

In the study by Manfredi G. et al,⁹ they included a total of 200 patients undergoing upper GI endoscopy. When compared with the Control Group with no pre-treatment, they observed that the patients in the pre-treatment Group had significantly better mucosal cleaning in all parts of the stomach and reduced need for water flush (P value: less than 0.001). They concluded that pre-treatment with Simethicone and NAC facilitated better visualization in the upper GI endoscopy. These findings were similar to the present study. Similar results were

observed in other studies as well.^{10,11,12,13}

In the meta-analysis by Li Y. et al,¹⁴ they included a total of 10 studies. They observed significant improvement in the mucosal visibility along with shorter operative times in the patients pre-treated with mucolytic agents. They also did not observe any significant adverse effects apart from nausea, vomiting and bloating. These findings were similar to the present study.

Upper GI endoscopy is the commonly used procedure for diagnosis of upper GI lesions. It involves the passage of endoscope for direct visualisation. Understandably, any food residue, mucus, foam, bubbles, blood, bile, etc may hinder adequate visualisation. Therefore, it is generally recommended to be done after fasting for 6 hours. For clearing out the mucus, foam and bubbles, frequent washes are required during the procedure which increases the procedure time and causes significant discomfort to the patients. NAC is an antioxidant and mucolytic agent which decreases the mucus viscosity while Simethicone is a defoaming agent. Thus, pre-treatment with both the drugs in combination, improves the mucosal visibility significantly.

Limitations: The present study was limited by the OPD attendance of patients undergoing upper GI endoscopy. Therefore, the results may not be generalised.

CONCLUSION

The pre-treatment of patients with Simethicone and NAC before upper GI endoscopy significantly improves the visualization of the mucosal lesions and thereby significantly improves the diagnostic accuracy. It is recommended that the pre-treatment may be routinely used for patients undergoing upper GI endoscopy.

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