

Is esophagoscopy necessary for corrosive ingestion in adults?

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SUMMARY. The aim of the study was to determine whether early esophagoscopy is really necessary for the patients who have ingested a corrosive agent. Patients who were followed up with the diagnosis of corrosive ingestion in our clinic between the years 1998 and 2008 were studied retrospectively. The data were collected through the medical records of the patients and from interviews with them. The analyzed parameters included age, gender, the nature and the amount of the ingested agent, whether the event was accidental or suicidal, diagnostic tools, treatment and the results of the treatment, and long-term follow up. Over a 10-year period, a total of 124 cases of corrosive ingestion cases were determined. Of these, 64 (51.6%) were male and 60 (48.4%) were female. The mean age was 38 ± 17.5 years. The most commonly ingested corrosive agents were sodium hypochlorite in 50 (40.3%) patients and hydrochloric acid in 33 (26.6%) patients. The mean admission time for the emergency department after ingestion of the corrosive agent was 2.5 ± 3.7 hours. Ingestion was accidental in 82% of the patients and as a result of a suicide attempt in 18%. The amount of ingested corrosive agent in the suicidal group (190 ± 208.3 mL) was higher than that of accidental group (66 ± 58.3 mL) ($P = 0.012$). Nine patients underwent esophagoscopy, six of which were performed in other clinical centers. Only three (2.4%) patients experienced esophageal stricture, which were treated with repeated dilatations. In the long-term follow up, we could get in touch with only 63 patients and none of them had complications due to corrosive ingestion. The follow-up period ranged from 1 to 120 months (median 45 ± 29.2 months). Based on our study, early esophagoscopy appears to be unnecessary in adult patients who ingested the corrosive agent accidentally. A larger prospective study is needed to answer the question.

KEY WORDS: adult, corrosive ingestion, esophageal burn, esophagoscopy.

INTRODUCTION

Esophageal burns that have occurred because of the ingestion of strong acidic or alkaloid materials, either accidental or caused by suicide attempts, are called corrosive esophageal burns (CEB). They are still quite common. A total of 5000 to 15 000 CEB cases have been admitted per year.^{1–4} The most commonly ingested corrosive agents in our country are alkaloids such as washing soda, washing-up detergents and sink detergents, and acidic agents such as hydrochloric acid and inorganic acid. While acidic agents cause coagulation necrosis, alkaloids cause liquefaction necrosis on the wall of the esophagus.^{5–8}

In this study, the adult patients who applied to our clinic with the complaint or suspicion of corrosive

agent ingestion were evaluated, and their early and late follow-ups were performed. In our series, only three patients had esophageal stricture and required esophagoscopy for treatment. In the literature, esophagoscopy has been widely recommended as an early method for the diagnosis or treatment, but is it really necessary for corrosive ingestion? Our study is an attempt to find out an answer for the question.

MATERIAL AND METHODS

The adult patients who applied to our clinic with the complaint or suspicion of corrosive agent ingestion between October 1998 and October 2008 ($n = 124$) were evaluated retrospectively. Hospital records of the patients were evaluated for age, gender, complaints, time passed before their admission to the clinic, type and amount of the agent ingested, reason

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for ingestion (accidental or for a suicide attempt), the damage occurred, the treatment, and its results. During admission, the patients were examined physically and stabilizations were achieved (blood pressure, pulse, and respiration). Chest X-ray radiographies of all patients were taken. Then, whether there was perforation or not was investigated by esophagography under scopy with water-soluble, non-ionic contrast material.

Food ingestion was ceased after admission to the clinic, and patients were given prednisolone, proton pump inhibitor, and antibiotic intravenously. The patients were followed closely for indications of esophageal perforation. At the end of the second day, they were allowed to have liquid food if no indication of perforation was observed and if their clinical symptoms faded away. At the end of the third day, the patients who had no problem in food ingestion were discharged with anti-acid and anti-inflammatory treatment. They were warned of the indications of esophageal perforation and advised to have liquid food. Patients who could not tolerate oral ingestion or whose complaints recurred were followed in hospital. Discharged patients were asked to come for a control at the end of the third week. Barium studies were performed during the control and the results were consulted to the Department of Radiology for the complications that could occur because of corrosive ingestion. All of the patients who had ingested the corrosive agent for a suicide attempt were consulted to the Department of Psychiatry. For the long-term follow up, all the patients we could manage to get in touch with were surveyed for their physical conditions, and their complaints were evaluated.

Esophageal burns were classified according to the depth of the lesion. First-degree injury involves hyperemia and edema of the mucosa. In second-degree injuries, ulceration with necrotic tissue and white plaques are seen, but the injury is less than circumferential. Sloughing of tissue with deep ulcerations in a circumferential pattern and full-thickness necrosis with perforation are seen in third-degree injuries.^{7,8}

STATISTICAL ANALYSIS

SPSS for Windows 14.0 software was used for the statistical analysis. Parameters of the patients were given as mean \pm standard deviation. For the evaluation of the data, independent-samples *t*-test and X^2 test were used. The value $P < 0.05$ was considered statistically significant.

RESULTS

Of the 124 patients included in the study, 64 (51.6%) were male and 60 (48.4%) were female. The mean age

was 38 ± 17.5 (16–82 years). A total of 102 (82%) of the patients ingested the corrosive agents accidentally, whereas 22 (18%) ingested the agents for suicide attempts. The number of males (male/female – 59/43, $P < 0.001$) in the accidentally ingested group and the number of females (male/female – 3/19, $P < 0.001$) in the suicide attempt group were statistically high. The mean period between the ingestion of the corrosive agent and admission to the clinic was 2.5 ± 3.7 hours (30 minutes–24 hours). There was no statistical difference in the admittance period between the accidental ingestion group and the suicidal ingestion group ($P = 0.24$). The most common symptom during admittance to the emergency department was throat ache (19.8%), which was followed by sore throat (18.3%), nausea, and vomiting (17.5%).

The most commonly ingested corrosive agents were sodium hypochlorite with 50 patients (40.3%) and hydrochloric acid with 33 patients (26.6%). Other ingested agents are shown in Table 1. When compared for the amount of the agents ingested, there was a statistical difference between the groups ($P = 0.012$); the amount in the accidental ingestion group was 66 ± 58.5 mL, while it was 190 ± 208.3 mL in the suicidal ingestion group.

Esophagoscopy was performed for nine patients, in total. Six of the patients who were sent from other health centers had undergone esophagoscopy. In two of those patients, grade 1 and in 1 grade 2 lesions had been defined, and in three, no pathology had been observed. Actually, if we had examined those patients first, we would not have performed endoscopy. In fact, no stricture would have developed in those patients. The esophagography and gastrography examinations of these patients were normal and they develop no stricture or other pathologies during follow up. Only three of the patients included in our series developed esophageal stricture during the follow-up period (two of them had ingested inorganic acid, and one, hydrochloric acid). Two of the cases (names: TY, RO) were suicidal corrosive agent ingestion, and one (name: FS) was accidental ingestion. All three patients were treated with repetitive balloon dilatation. Eight endoscopic dilatations, two in our

Table 1 Distribution of ingested corrosive agents

Corrosive agents	N	%
Sodium hypochlorite	50	40.3
Hydrochloric acid	33	26.6
Inorganic acid	22	17.8
Thinner	5	4.0
Liquid soap	5	4.0
Fat solvent (5% alkanolamine)	3	2.5
Hair relaxant (hydrogen peroxide)	2	1.6
Lime solvent (25% hydrochloric acid)	2	1.6
Silver nitrate	1	0.8
Zefiran (1% Benzalkonium chloride)	1	0.8
Total	124	100

and six in another institutions, had been performed for TY. Endoscopic dilatations required three times for RO and FS.

The mean hospital stay was 2.8 ± 1.8 days (1–18 days), and there was no statistical difference between the groups ($P = 0.144$). No mortality or perforation occurred in our series. During long-term follow up, we could get in touch with 63 (50.8%) of the 124 patients included in the study. When evaluated for their gastrointestinal tract complaints, none of them exhibited complications due to corrosive ingestion, and only two patients complained about stomach-ache. The mean long-term follow-up period was 45 ± 29.2 months (1–120 months).

DISCUSSION

Corrosive esophageal burn is still a serious health problem because of its high incidence. In infants, corrosive agents are ingested either because their parents give it to them accidentally or because they are mentally retarded. The ingestion of a corrosive agent to attempt suicide in adults is more common than it is in infants.^{9–11} In our country, the accidental ingestion of corrosive agents instead of water is very common.

In many studies, esophagoscopy within the first 24 hours has been suggested to be the only choice to determine the severity and extend of corrosive esophageal burn. When CEB is suspected, some researchers are against early esophagoscopy because of the risk of esophageal perforation. However, some researchers believe that by the help of esophagoscopy, the lesion and the changes in mucosa can be viewed directly, and the severity of the burn can be assessed. Thus, an unnecessary treatment will be avoided or early intervention will be possible when there is a serious case.^{12–17} We discharge our patients by minimizing the treatment, and with some advice if no progression in symptoms and no deterioration in vital signs are observed over a 48 to 72-hour follow up.

Widely used bleachers include sodium hypochlorite or sodium hydroxide. Since they are poor corrosive and cause only nausea and vomiting due to mucosal irritation, endoscopy is not a necessity for such cases.^{11,14} In our study, the most commonly ingested corrosive agent was sodium hypochlorite. No perforation was observed in patients who ingested sodium hypochlorite, and no stricture occurred in long-term follow up. We believe that esophageal burn in bleacher ingestion is rare because this agent is diluted before use, or it can be detected easily because of its scent and is not swallowed in large amounts.

In our study, we performed esophagography with water-soluble, non-ionic contrast material for all patients who applied to our clinic with the complaint or suspicion of corrosive ingestion, and no perfora-

tion was detected. We did not perform esophagoscopy to any of our patients in the early stage. There are several reasons for this. First, esophagoscopy should be advanced to the level where CEB is first observed. However, the burn is mostly located in distal esophagus and there is no use of esophagoscopy in such cases. Second, the patient who is under general anesthesia for esophagoscopy lies in the supine position, and this position causes the corrosive agent in the stomach to reflux to the esophagus and increase the damage present. Third, because the strongest layer on the wall of esophagus, the mucosa, has been damaged, esophagoscopy can easily cause perforation. Finally, esophagoscopy does not always allow for the exact assessment of the degree of the esophageal burn. The most important point in patients who had ingested a corrosive agent is to detect whether there is a perforation in the acute stage. If there is no perforation, a preventive treatment should be planned for a stricture that may develop in the future.

Radiological examination of the esophagus and stomach is the best method for the assessment of the severity of esophageal and stomach burns. After the ingestion of the corrosive agent, changes in the radiological images of the esophageal and stomach burn depend on the severity of the burn and the time that has passed.^{17,18} Muhletaler *et al.* did not observe any perforation in the radiological examinations of the patients after the ingestion of corrosive agents.¹⁸ According to Silva *et al.*, the ingestion of alkaloid agents is more common, and in most cases, it happens accidentally. They reported that the amount of the corrosive agent is quite low in accidental ingestions; it is, however, considerably high in suicide attempts, specifically in adults. In the same study, grade 1 burns were observed in 44% of the patients who underwent esophagoscopy, and the more serious lesions were in adults who ingested the corrosive agent for suicide attempt.¹¹ Gupta *et al.* argued that endoscopy is unnecessary especially in asymptomatic patients.¹⁹ In our series, the amount of the agent was higher in the suicide attempt group than in the accidental ingestion group; still, no perforation was observed.

Benign esophageal strictures develop because of corrosive esophageal burns, and this is a serious problem. In CEB, possibility of stricture development is 12–35% and, especially in grade 1 burns, no stricture is expected.^{13,20} In our series, esophageal stricture developed in three patients (2.4%), and two of them were in the suicide attempt group. These patients were treated with repetitive balloon dilatations. We believe that the rate of the stricture development in our series was low because the number of the accidental ingestion was higher and because the most commonly ingested agent was sodium hypochlorite.

In conclusion, in patients who are admitted for corrosive ingestion, chemical characteristics and the

amount of the ingested agent, as well as the reason for ingestion (accidental or for suicide attempt), should be known. Especially in the accidental ingestion group, the amount of the ingested agent is lower and no complications develop. We believe that in such patients, radiological evaluation will be enough in the early stage and the esophageal damage will not require a more invasive attempt, specifically in adults, and that in the suicidal ingestion group, the clinical follow-up period should be longer, depending on the clinical indications.

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