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Caustic Lesions of the Upper Digestive Tract at the Yalgado Ouédraogo University Hospital in Ouagadougou

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Abstract

Introduction: Considered a medical-surgical emergency, caustic ingestion exposes the patient to serious injuries requiring multidisciplinary management. Several substances may be involved. The aim of our study was to evaluate caustic lesions in adults at the Yalgado Ouedraogo University Hospital. **Patients and methods**: This was a cross-sectional, descriptive study lasting 6 years and 7 months, with retrospective and prospective data collection. Adult patients hospitalized for caustic ingestions at the Yalgado Ouédraogo University Hospital were included. Patients with usable upper gastrointestinal endoscopy reports and/or cervico-thoraco-abdominal CT scan were included. **Results**: Hospitalization rate was 1.8% (n = 33). Mean age was 33.5 years, with a sex ratio of 3.1. Ingestion was voluntary in 25 patients, with psychiatric disorders in 17. The product ingested was an acid in 24 patients. It was liquid in 90.9% of cases, and quantified in 16 patients at between 15ml and 300ml. Self-medication was noted in 20 patients. 54.5% of patients sought medical attention within 24 hours. Vomiting dominated the clinical picture in 92.9% of cases. The stomach was the most affected area, accounting for 93.9% of cases. Stage II of the Zargar classification was the most frequently encountered. Two cases of perforation, two deaths and eleven stenoses were recorded. All patients received medical treatment, three endoscopic dilatation and ten feeding jejunostomy. **Conclusion**: In the absence of national statistics, the ingestion of caustic prod-

ucts appears to be infrequent in our context. However, preventive measures are essential, given the risk of serious injury and death despite surgical management.

Keywords

Caustic Ingestion, Caustic Esophagitis, Caustic Gastritis, Caustic Stenosis, Africa

1. Introduction

The ingestion of caustic products is a dramatic event that exposes the patient to serious injuries and requires multidisciplinary management [1]. Considered as a medical-surgical emergency, caustic ingestion is a public health problem, due to the severity of the injuries caused and the risk of after-effects affecting quality of life. Caustic ingestion can be accidental or deliberate, and is mainly associated with damage to the digestive tract, but also with respiratory or even systemic damage, depending on a number of factors. When it is suicidal, psychiatric disorders may be associated. The narcissistic personality and loss of self-esteem precipitate the transition to voluntary intoxication [2]. The substances involved are usually acids, bases and oxidizing agents. The severity of lesions depends on the quantity, form and nature of the product ingested [1] [3]. The epidemiology of caustic ingestions worldwide is relatively unknown. In France, a 10-year study (2010-2019) documented 3544 emergency room admissions for caustic ingestion, *i.e.* 0.016% of all emergency room admissions [1]. In 2013, 60,000 cases of caustic ingestion were described in the United States [4]. In Burkina Faso, the epidemiology of caustic ingestions is also poorly understood, in the absence of national statistics. The difficulties encountered in the management of caustic burns represent challenges in our context. The aim of this study was to investigate caustic burns in adults admitted to the hepato-gastroenterology department of the Yalgado Ouedraogo University Hospital in Ouagadougou.

2. Patients and Methods

This was a cross-sectional, descriptive study, with retrospective and prospective data collection. It ran from January 1, 2017 to December 31, 2022 for the retrospective phase and from January 1, 2023 to July 31, 2023 for the prospective phase. It was conducted at the Yalgado Ouedraogo University Hospital in Ouagadougou, Burkina Faso.

All patients hospitalized for caustic ingestion with a usable report of an upper digestive endoscopy and/or cervico-thoraco-abdominal CT scan in the medical record were included. Patients hospitalized for undocumented caustic ingestion were excluded. This selection bias, together with the monocentric nature of the study, reduced the sample size.

Endoscopic lesions were assessed according to the Zargar classification. The volume of caustic ingested was approximated by sip or glass of water, in order to establish an overall estimate of the quantity absorbed.

Data were collected in both retrospective and prospective phases, using a data collection form based on information contained in medical records and reports of complementary examinations. The variables studied were sociodemographic, clinical, paraclinical, therapeutic and evolutionary. Data were analyzed using Epi-Info 7 software. Data collection was carried out with respect for patient anonymity and confidentiality.

3. Results

In all, we recorded 33 cases of caustic ingestions out of 1,796 hospitalizations, representing a hospital frequency of 1.8%. The mean age was 33.5 years, with extremes of 16 and 62 years. Patients under 40 accounted for 75.8% (n = 25). The sex ratio was 3.1. The majority of victims were farmers and workers with a low socio-economic level, *i.e.* 63.6% of our patients. Table 1 shows the socio-demographic characteristics of our patients.

Table 1. Socio-demographic characteristics.

Socio-demographic characteristics		Number n (%)	
Gender	Men	25	(75.8)
	Women	8	(24.2)
	Total	33	(100)
Residence	urban	29	(87.9)
	Rural	3	(9.1)
	Not specified	1	(3)
	Total	33	(100)
Profession	Retailer	5	(15.1)
	Cultivator	12	(36.4)
	Pupil/student	3	(9.1)
	Gold digger	1	(3)
	Worker	9	(27.3)
	Employee	3	(9.1)
	Total	33	(100)

Ingestion was voluntary in 25 patients, 23 for autolysis and 2 for therapeutic purposes. Table 2 illustrates the reasons for ingesting caustic products.

Table 2. Caustic product ingestion reasons.

Patterns	Number	Percentage
Autolysis	23	69.7

Continued

Therapeutics	2	6
Accidental	3	9.1
Not specified	5	15.2
Total	33	100

Psychiatric disorders were present in 51.5% (n = 17) of victims. The product ingested was an acid in 24 patients, a base in 4 and an oxidizing agent in 1. It was liquid in 90.9% of cases (n = 30). It could be quantified in 16 patients, and ranged from 15 ml to 300 ml. Self-medication was noted in 20 patients, and was oil-based in 14 of them. Treatment time ranged from 2 hours to 45 days, and 54.5% (n = 18) of patients consulted their doctor within 24 hours. Vomiting dominated the clinical picture at 92.9%. Table 3 summarizes the clinical signs on admission.

Table 3. Clinical signs at the time of admission.

Signs	Number	Percentage
Vomiting	31	93.9
Epigastric pain	29	87.9
Digestive hemorrhage	18	54.5
Dysphagia	18	54.5
Retro sternal pain	11	33.3
Oral lesions	11	33.3
Hypersialorrhea	8	24.2
Odynophagia	7	21.2
Confusion	4	12.1
Agitation	3	9.1
Respiratory distress	2	6.1
State of shock	2	6.1
Skin lesions (thorax)	2	6.1

Caustic burns involved the esophagus (90.9%), stomach (93.9%), bulb (69.7%) and duodenum (54.5%). Their severity was assessed using the Zargar classification. Table 4 illustrates the endoscopic lesions observed in our series.

Table 4. Endoscopic lesions in the upper digestive tract.

Zargar	Esophagus		Stomach	Bulb	Duodenum	
Classification	n (%)		n (%)	n (%)	n (%)	
Normal	3	(9.1)	2 (6.1)	9 (27.3)	14	(42.4)
Stage I	3	(9.1)	5 (15.2)	10 (30.3)	12	(36.4)
Stage IIa	11	(33.3)	7 (21.2)	4 (12.1)	2	(6.1)

Continued

Stage IIb	8	(24.2)	6 (18.2)	4 (12.1)	3	(9.1)
Stage IIIa	4	(12.1)	6 (18.2)	5 (15.2)	0	(0)
Stage IIIb	2 (6.1)		5 (15.2)	0 (0)	1	(3)
Stage IV	1 (3)		1 (3)	0 (0)	0	(0)
Stenosis	1 (3)		1 (3)	1 (3)	1	(3)

*Four patients were seen with stenosis at initial endoscopy.

A cervico-thoraco-abdominal CT scan of one patient revealed interstitial lung disease.

All patients benefited from symptomatic medical treatment with correction of hydrolytic disorders, administration of proton pump inhibitors, antibiotics and analgesics. Oral food restriction was indicated in 75.8% (n = 25) of patients, 6 of whom received compensatory parenteral nutrition. Corticosteroid therapy was used in two cases, and 17 patients received psychiatric treatment.

During the course of the disease, seven stenosis occurred, bringing the total number of stenosis to 11, two cases of perforation and two deaths. Endoscopic dilation was performed in three patients, and 10 patients were transferred to surgery for a feeding jejunostomy.

4. Discussion

Caustic ingestion had a hospital frequency of 1.8%, close to that of Bassène in Senegal [5] and Coulibaly in Mali [6], who found a prevalence of 1.7% and 2.1% respectively. This would appear to be an under-reported event in our context, due to the absence of a poison control center. Because of this under-reporting, epidemiological data worldwide are limited, especially in developing countries [7] [8].

The average age of our patients was 33.5 years. This was a young population, three quarters of whom were under 40. Our results are close to those of Coulibaly in Mali with 33.05 years [6] and Bedou in Morocco with 35 years [9]. Several authors reported an average age different from ours. Soro in Ivory Coast [10] and Khadidjatou in Benin [11] reported ages of 20.77 and 25.54 respectively, with patients of all ages in their series. Caganova in Slovakia [12], with a mean age of 51.8 years, sampled older subjects. These differences may be explained by patient sampling.

The predominance of males in our study has also been reported by some authors [6] [11] [12]. On the other hand, others report a predominance of females [3] [9] [10].

Ingestion for the purpose of autolysis has also been reported in the literature [3] [6] [9] [13] [14]. Caganova reported mainly accidental exposure in a population of elderly people [12]. This situation could be explained by the unstable psychological state of our patients, more than half of whom suffered from psychiatric disorders that could predispose them to an attempt at autolysis. Authors have also

reached the same conclusion [9] [13] [15]. It could also be explained by the young age of the victims, although we have not established a link between young age and suicide risk. Young age corresponds to the most active period of life in our context, and would be more exposed to the stresses of life.

Acid was the most commonly used caustic in our series, as it was in Coulibaly in Mali [6], Bedou in Morocco [9], Khadidjatou in Benin [11] and Caganova in Slovakia [12]. In the literature, other caustics such as bases or oxidants have been preferred [3] [5] [10] [14]. The nature of the caustic depends on its availability in different countries. In our context, the acid used came from motorcycle or vehicle batteries, which are easily accessible to the local population.

For AS Thot'O in Ivory Coast, self-medication was very common, and palm oil was the main product used. Certain beliefs, well established among the population, attribute therapeutic virtues to palm oil and milk in cases of intoxication [2]. In our series, almost two-thirds of patients resorted to self-medication, and oil was the substance most frequently used.

Our patients' symptoms were dominated by vomiting, epigastric pain, digestive haemorrhage and dysphagia. Oral and skin lesions were also present on physical examination. This predominance of digestive signs may be explained by the nature of the product ingested. Series have reported these symptoms in varying proportions during episodes of caustic ingestion [6] [9]. For Caganova, respiratory complications were more frequent in elderly subjects who had ingested a caustic product [12].

In the present study, lesions at upper gastrointestinal endoscopy involved the entire upper gastrointestinal tract, with gastric involvement predominating at 93.9%. Soro also found preferentially gastric lesions at 36.11%. This predominantly gastric involvement could be explained by the retention of caustic in the gastric cavity, increasing both wall destruction and mucosal irritation [10]. Bulbar (23 cases) and duodenal (18 cases) lesions were also frequent in our patients, compared with Bedou [9], who reported 3 cases. According to the literature, a pylorospasm prevents caustic substances from entering the duodenum, but may be deficient in the event of massive caustic ingestion [11].

In our series, stage II lesions were frequent in the esophagus and stomach. Lesions were most severe in the esophagus and stomach, although the bulb and duodenum were frequently affected by less severe lesions. In the literature, the location and severity of lesions vary [2] [3] [6] [10]. The nature and severity of lesions depend on the type of caustic, its concentration, the quantity ingested, the contact time of the product with the mucosa, and the time taken to treat it [5]. Added to these factors was the suicidal nature of the ingestion, which concerned 23 of our patients. Hollenbach and other authors have suggested that suicidal intent is associated with more severe mucosal lesions, as a result of the greater volume ingested [11] [14] [16].

Cervico-thoraco-abdominal CT scan was performed in a patient who also had upper gastrointestinal endoscopy. In our series, CT scan was not a systematic part

of the management process. For authors such as Anduquia and Lurie, CT scan should not be the sole basis for surgical decisions during the initial phase of caustic ingestion. A normal CT scan may not exclude a significant risk of progressive lesion [17] [18]. Currently, the therapeutic algorithm is based on CT scan alone. It reliably detects esophageal transmural necrosis, improves selection for surgery of severe esophageal lesions and better assesses the risk of esophageal stenosis [1] [19].

In our study, all patients received symptomatic medical treatment. In the literature, 92% to 97% of caustic lesions are treated medically in the acute phase. Treatment is based on proper hydration and resting the digestive tract for a period of time that varies according to the severity and location of the lesions. Some authors recommend systematic antibiotic therapy. It should be early, prolonged and broad-spectrum [9]. Emergency surgery is ultimately necessary in a small number of patients with transmural necrosis, to avoid damage to adjacent organs and death [20]. This is also the case in cases of perforation, severe digestive haemorrhage and shock [9]. In our series, two patients underwent surgery for esophageal and gastric perforation. Also, 10 patients had recourse to a feeding jejunostomy. Enteral nutrition is recommended as soon as possible, even in severely burned patients [1] [20].

The evolution of our patients was marked by the onset of stenosis. It usually complicates grade IIb or III caustic lesions, and was 33.3% in our series. This result corroborates that of Coulibaly in Mali with 35% [6] and is higher than that of Bedou in Morocco, who reported 8.4% [9]. Its occurrence is favored by a number of factors, including the modalities of initial management [14]. Mortality after ingestion of caustic products is high worldwide, ranging from 5 to 20% [12]. In our study, it was 6.1%. This result is lower than that of Coulibaly in Mali, who reported 15% [6], and Bedou in Morocco, with 14.4% [9]. The main factors contributing to poor prognosis are advanced age and severity of lesions.

The monocentric nature of our study limited our sample size. Patients may have been admitted for caustic ingestion to other hospitals in Ouagadougou. Also, the partial retrospective nature of the study did not allow for exhaustive collection of data over the period and analysis of risk factors for the problem. Despite these limitations, this study enabled us to assess the management of caustic ingestion victims at the Yalgado Ouedraogo University Hospital.

5. Conclusion

In the absence of national statistics, the ingestion of caustic products appears to be uncommon in our practice context. It is most often encountered in attempts at autolysis occurring in the context of psychiatric disorders. It leads to serious lesions of the digestive tract, which can be fatal and may require emergency surgery. In the long term, after-effects such as esophageal stenosis can be life-threatening, hence the need to develop interventional endoscopy in our hospitals. Measures must also be taken to prevent this tragedy. Public awareness campaigns, regulation of the sale and storage of caustic products could reduce the occurrence of this health problem.

Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

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