

# The impact of psychological illness on outcome of corrosive esophageal injury

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## Abstract

**Purpose of Study:** Esophageal stricture is a debilitating condition with significant morbidity and mortality, occurring often as a complication of the ingestion of corrosives. In the adult, majority of cases are intentional whilst being accidental in the pediatric population. We therefore sought to describe the circumstances of intentional corrosive ingestion and determine the presence and impact of psychiatric illness on the outcome of management.

**Materials and Methods:** A retrospective analysis of case folders of patients managed with this condition over a ten-year period (2000–2009) was done by comparing sociodemographics and outcome of management in patients with and without psychiatric disorders.

**Results:** Twenty seven cases were reviewed. Mean age was 30.7 (SD =16.01), with a M:F ratio of 1.25:1.86.2% had a diagnosable psychiatric condition, the most common being depression in 55.6% of the patients. Caustic soda (55.6%) was the most common corrosive ingested. There was a significant difference in mean duration before presentation in patients with (1.7 days) and without (6.6 days) previous psychiatric illness ( $P = 0.01$ ). A significant positive association was also found between surgical outcome and previous history of psychiatric disorder ( $P = 0.02$ ).

**Conclusion:** Early recognition of psychosocial distress is important to prevent deliberate self-harm. Counter-intuitively, a previous history of psychopathology limits esophageal injury by early presentation and therefore improve chances of a good surgical outcome.

**Key words:** Corrosive, deliberate self harm, outcome

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## Introduction

Nigeria is currently going through a very stressful period in her history, with high unemployment rate, poor standard of living, economic and social instability amongst others,<sup>[1]</sup> it is often difficult to determine the effects that these have on individuals. However the stress levels appear to be increasing, evidenced by the increasing number of patients seen weekly in our psychiatric outpatient clinics. The inability of individuals to handle stressful situations and conflicts has been linked to the high incidence of deliberate self harm.<sup>[2]</sup>

Although there is no country prevalence rate for suicide and deliberate self-harm in Nigeria, Eferakeya<sup>[3]</sup> reported a prevalence rate of 7 per 100 000 in the Eastern part of

the country, while 2 years later Odejide *et al.*<sup>[4]</sup> found a 6-month rate of 2.6 per 100 000 in Ibadan, southwestern part of Nigeria. Compared with Western countries this rate is very low.<sup>[5]</sup> The reason for this could be among others that, both Nigerian studies were based on hospital records which only represent individuals who got to the hospital before their death excluding death by suicide outside the hospital. Furthermore we also know that most completed suicides in Nigeria are not reported for both cultural and social reasons.

Depressive illness is considered the most common cause of suicide and deliberate self harm.<sup>[6]</sup> Reporting on the

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motives for deliberate self-harm in their study, Odejide *et al.*<sup>[4]</sup> found problems with interpersonal relationship as the most prominent cause, while acute stress reactions with feelings of hostility and hopelessness, rather than a more specific psychiatric diagnosis was the most common diagnosis. They also reported in their study, that the use of corrosive chemical was the most common method used for deliberate self-harm in their cohort.

Although the ingestion of corrosive agent is often accidental in the pediatric age group,<sup>[7]</sup> it is most times intentional among adults and adolescents.<sup>[2,7]</sup> Various corrosive agents have reportedly been ingested, and these have been broadly divided into acids [battery water], alkalis [caustic soda]. Organophosphates [e.g. pesticides] are also commonly ingested in a suicidal bid, but these are not strictly corrosive in nature. Ogunleye, *et al.*,<sup>[8]</sup> reviewing the occurrence of corrosive oesophagitis in Nigeria between 1990 and 1999, showed that 35% of the patients ingested corrosive agents deliberately in a suicidal attempt, while 43% ingested it accidentally among which 60% were children. He also reported that caustic soda was the commonest agent used by 48% of the patients reviewed, followed by sulphuric acid in 39% of cases.

The degree of injury resulting from the ingestion of these agents depends on several factors, including the nature of the agent itself, while acids cause coagulation necrosis, alkali agents cause saponification or liquefaction necrosis.<sup>[9]</sup> Other factors include the physical form of the substance, the amount ingested, and the intent.<sup>[10]</sup>

The objective of this study was to determine the impact of psychological illness on the outcome of management of corrosive esophageal injury.

## Materials and Methods

The study was conducted at the Obafemi Awolowo University Teaching Hospitals Complex, Ile-Ife. The hospital is a tertiary health institution, which serves as a referral center for Osun state and neighboring Ondo and Ekiti states, thus it serves a population of about 4 million people. The hospital has cardiothoracic and psychiatric units which received and managed the patients.

A retrospective analysis of case folders of patients who ingested corrosive agents in the past 10 years and were seen in the hospital was performed. In the period under review, 54 cases of deliberate self harm were managed in the hospital, out of which 32 (59.2) ingested corrosives, but only 27 (84%) had enough information to be included in the review. Classification of psychiatric diagnoses was from the ICD-10 classification. A questionnaire was prepared to extract information on clinical and socio-demographic

variables from the case folders, while patients who were still attending either the psychiatric clinic or the cardiothoracic clinics were also interviewed by the psychiatrist for more information and clarification of information obtained from the case folders where necessary. Children below the age of 12 were excluded from the study.

Ethical clearance for this study was obtained from the hospitals ethical committee.

## Statistics

The data were analyzed using the statistical package for the social sciences (SPSS), version 10. Descriptive statistics was used to ascertain rates.

## Results

The mean age of the cases reviewed was 30.7 (SD = 16.02), with a M:F ratio of 1.3:1. Mean age of male patients was 34.4 years (SD = 13.6) and 26.4 years for females ( $P = 0.19$ ). [Table 1] Mean age of patients with previous psychiatric illness was 41.8 years and 26.3 years for those without previous diagnosis ( $P = 0.01$ ). Mean duration before presentation in the hospital was 7.24 days (SD = 5.7), with a significant difference between patients with a previous psychiatric history (1.7 days) and those without a previous history of psychiatric disorder (6.6 days) ( $P = 0.01$ ). Mean duration of hospital admission was 3.5 weeks (SD = 0.9) for patients with previous psychiatric diagnosis and 6.4 weeks (SD = 2.0) for patients without previous diagnosis ( $P = 0.0001$ ).

The most commonly ingested corrosive substance was caustic soda (55.6%), followed by battery fluid (22.2%).

**Table 1: Sociodemographic variables**

Variable	Frequency	Percentage
Age		
<30	17	63.0
30-65	9	33.3
>65	1	3.7
Sex		
Male	15	55.6
Female	12	44.4
Marital status		
Married	13	48.9
Single	14	51.1
Educational status		
Post primary education	21	77.8
Tertiary education	6	22.2
Employment status		
Government employed	4	14.8
Privately employed	4	14.8
Unemployed	8	29.6
Student	11	40.7

Of the 15 patients who ingested caustic soda, only 1 (6.7%) had a prior psychiatric diagnosis ( $P = 0.003$ ).

Twenty three (85.2%) admitted to deliberate ingestion of the corrosive agent, while four (14.8%) said use was accidental. Ten (37.1%) of the patients left a note indicating why they wanted to die, seven of whom were males.

The most common reason for the ingestion of corrosive was financial difficulty for the male patients (80%) and interpersonal conflicts among female patients (83%). Among the male patients, ten (66.7%) said they wished they had died while five (33.3%) said they were happy to be alive [including two male patients who took corrosive accidentally] but among the female patients five (41.7%) said they wished they had died, while seven (58.3%) said they were happy to be alive [including one female patient who took it accidentally]. Married patients ( $P = 0.03$ ) and tertiary educational level ( $P = 0.002$ ) were significantly associated with previous psychiatric illness.

There was previous history of psychiatric disorder in 8 (29.6%), A total of 23 (85.2%) patients eventually had a psychiatric diagnosis, with depression (55.6%) being the most common ailment followed by acute stress reaction (18.5%).

Outcome was considered good (restoration of oral feeding without any surgical procedure) in 9 (33.3%), fair (restoration of oral feeding only after repeated dilatation) in 11 (40.7%) and poor (requiring tube feeding after failed dilatation) in 7 (25.9%) [Table 2]. A significant association was found between outcome and previous history of psychiatric disorder ( $\chi^2 = 8.12$ ,  $df = 2$ ,  $P 0.02$ ).

All 17 (63%) patients that had surgical intervention [dilatation or tube feeding] had specific psychiatric diagnoses.

## Discussion

Ingestion of corrosives with the aim of deliberate self harm continues to be a major cause of morbidity and mortality especially among adolescents and young adults.<sup>[11]</sup> This study further highlights the challenge of identifying and treating this group of patients in a developing economy like Nigeria, especially those who develop esophageal stricture, a relatively common complication of esophageal burns from ingestion of chemicals.

The mean age of the study population was 30 years, with the majority occurring in patients below 30 years of age, a result similar to the findings of earlier studies in this environment.<sup>[3,4]</sup> Patients with prior psychiatric illness (41.8 years) were significantly older than those without (26.3 years) suggesting that younger individuals who did not have any apparent emotional disturbances were coping less

**Table 2: Clinical variables**

Reason for ingestion		
Mental disorder	8	29.6
Interpersonal conflict	6	22.2
Financial difficulty	10	37.1
Accidental	3	11.1
Substance ingested		
Caustic soda	15	55.6
Kerosene	2	7.4
Acid	6	22.2
Gammalin '20'	1	3.7
Unknown	3	11.1
Source of ingested corrosive		
Home	20	74.1
Procured	7	25.9
Psychiatric diagnosis		
Acute stress reaction	5	18.5
Depression	15	55.6
Adjustment disorder	2	7.4
Psychotic disorder	1	3.7
Nil	4	14.8
Previous psychiatric history		
Yes	8	29.6
No	19	70.4
Psychiatric follow-up		
Yes	11	40.3
No	16	59.3
Surgical outcome		
Good (restoration of oral feeding)	9	33.3
Fair (requiring repeated dilatation)	11	40.7
Poor (requiring tube feeding)	7	25.9

with stressful situations. Financial difficulties and mental disorders,<sup>[12]</sup> were the most common causes of attempted suicide among males, giving credence to the importance of financial security especially among men in a male dominated society such as ours, where very often, a man's social standing is dependent on his financial strength. Thus many men become depressed and resort to deliberate self-harm.

On the other hand, interpersonal conflict was the most common reason for the ingestion of corrosives among female patients. This suggests that the act was mainly impulsive among females, with many not thinking through their actions. Most even confessed that they hoped they would not die as a result. Odejide *et al.*<sup>[4]</sup> in their study more than two decades ago had reported a strong association between deliberate self harm and the diagnosis of acute stress reaction among females which they attributed to diminishing social and emotional support for women. Our findings reveal that very little has changed since then. The majority (62.5%) of the patients with previously diagnosed mental illness were married while more (57.9%) of the patients without prior mental illness were single. It is, however, not clear the exact role that marital status plays as a risk factor as marital conflicts are not easily disclosed.

Low socioeconomic status such as low educational status, or living in a low income area, gender and marital status<sup>[13]</sup> use of psychoactive substances<sup>[12]</sup> previous or concurrent psychiatric diagnosis<sup>[14]</sup> have all been associated with deliberate self-harm. The findings in this study showed that financial difficulties were the most common reason for ingesting corrosive.

The majority of patients that were seen in our center took the corrosive substance deliberately, and although it is difficult to reliably quantify volume ingested, it is often assumed that large volumes of the corrosive substance have been ingested. Although the pathology caused by various agents is well documented,<sup>[15]</sup> we see varying and unpredictable patterns of injury, probably because of adulteration as well as varying concentrations of the substance ingested. This probably explains why some patients who ingested organophosphates, such as pesticides, also suffered corrosive injury. In fact, we assume that there is corrosive injury in patients on presentation until proven otherwise.

A previous history of psychiatric disorder was associated with a shorter duration before presentation in the hospital probably because caregivers were more on the lookout for warning signs in such patients than would have been the case, and thus acted promptly by bringing them for medical attention. However, in individuals without previous mental illness, suicidal actions may not have been properly discerned or understood, therefore presenting much later for help. This is often the case in our setting because caregivers will initially seek help from spiritualists and traditional healers. By this time, such patients already have established esophageal strictures and nutritional deficiencies.

An earlier presentation means that such patients may benefit from resuscitative procedures and treatment which attempt to limit the corrosive injury, as well as psychological stabilization because some patients are known to repeat the attempt at deliberate self harm. This is contrary to previously held undocumented beliefs that patients with previous psychiatric illness would eventually have more severe injuries.

This index study reveals that the majority (70%) of our patients were not known with prior psychiatric problems and also challenges the previously believed notion that patients with psychiatric history are more likely to have a worse outcome. The result is a shorter stay in hospital for patients with a known previous psychiatric disorder and a better outcome compared to those without a history of psychiatric disorder.

The large number of patients with eventual psychiatric diagnosis in this study (85%) agrees with a similar study,<sup>[16]</sup> which had shown that psychiatric conditions are important in deliberate self harm. The records revealed that many of

these patients had shown signs of distress, such as hinting relatives they were fed up with living, they wanted a change, or had been sighing repeatedly in the weeks before ingesting the corrosive substance. Unfortunately, psychiatric attention is usually not sought until there is a full-blown psychotic breakdown. There is therefore a need on the part of family members to be aware of the effect of stress on those around them especially the adolescents and young adults, and to recognize these signs. As in other studies<sup>[17]</sup> on deliberate self-harm, depression was the most common psychiatric condition diagnosed in this patients.

Only 30% of the patients had a previous history of a diagnosed mental disorder; although many of the other patients may have had subtle signs of psychological distress in the weeks preceding ingestion of the corrosive agent. Though it may have been impossible to prevent all of them from carrying out the act, prompt response to their cry for help will certainly have helped.

Another notable finding in this study is the ease with which the patients had access to the corrosive substance. Most of the patients (74%) already had the substance (caustic soda) at home, mostly for the purpose of local soap manufacture usually by another family member. The easy access to this agents explained why many of the female patients used caustic soda impulsively following interpersonal conflict with close relatives. It is pertinent to note however that almost all (87.5%) the patients with previous psychiatric illness did not choose caustic soda, an easily accessible agent, to harm themselves ( $P = 0.003$ ). This may either suggest that these patients were more emotionally stable despite their background illness and would only harm themselves in extreme situations or that they chose more obscure agents in order to conceal their intentions from their relations. Most of those who ingested acid were men who bought it under the pretext of needing it for their car batteries. We also noted that 26% of the patients went to purchase the substance themselves for the sole purpose of deliberate self-harm since it was easily available and could be procured without a license. In Nigeria, the National Agency for Food and Drug Administration and Control [NAFDAC] which is responsible for the control of access to chemicals, will therefore need to mount more effective surveillance and legislation to prevent easy access to these substances. Previous research<sup>[18,19]</sup> had reported on the high prevalence of corrosive stricture from the ingestion of caustic soda used for soap making in Nigeria. This study further confirms that the situation has not changed in over a decade, thus highlighting the need for stricter measures for the procurement of these chemicals.

This study is limited by its retrospective nature as this may only suggest association but not causation as well as the fact that the sample size was small making it difficult to generalize the findings in a larger population.

In conclusion, we observed that corrosive esophagitis is on the increase, and this is mainly following deliberate ingestion of corrosive in a parasuicidal attempt, which among males is often due to financial difficulties and among females, due to interpersonal conflicts. Contrary to opinion, a previous history of psychiatric illness appears to positively influence outcome by early presentation and therefore onset of treatment. Further prospective studies will help to substantiate these findings.

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