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SHORT REPORT

A pilot study on the management and outcomes of self-poisoning in a rural Ugandan Emergency Centre

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ABSTRACT

Introduction: The Global Emergency Care Collaborative and Nyakibale Hospital in Rukungiri opened the first functional emergency centre in rural Uganda. We investigated decontamination, management and outcomes of poisoned patients in the emergency centre.

Methods: An electronic database started recording charts from 24 March 2012. A search for diagnoses concerning self-poisoning was performed from 24 March 2012 to 30 December 2013 and 192 charts were found and de-identified. Data collection included: age, sex, poison and duration, intent, vital signs, physical examination, decontamination, antidote use and follow-up status.

Results: From 24 March 2012 to 30 December 2013 poisoning accounted for 96 patient encounters. Of these, 33 were associated with alpha-2 agonists and 16 were associated with organophosphorous or carbamate pesticides. The post-decontamination fatality rate was 5.7%. The fatality rate of those without decontamination was 8.3%. Of those who were given atropine, 38.8% had no known indication. Of the 96 patient encounters, there were seven deaths; six were due to pesticides.

Discussion: In resource-limited settings where antidotes and resuscitative capabilities are scarce, decontamination needs to be studied further. Repeat atropine use without indication may lead to depletion of an essential antidote. Future directions include a public health education programme and an algorithm to help guide clinical decisions.

African relevance

- Self-poisoning remains an important cause of morbidity and mortality in Africa, yet little is known about the causes of self-poisoning in rural Uganda.
- Although emergency training is lacking in Uganda, a toxicology curriculum is provided in the emergency care training programme.
- Establishment of a poison control centre in Uganda that supports care of self-poisoned patients would improve care in the region.

Introduction

Although there has been a steady decline in suicides in the world, intentional poisoning remains a leading cause of suicide, accounting for one out of seven suicides globally [1]. Intentional self-poisoning occurs when an individual ingests a poisonous substance with the primary objective of self-harm.

In Uganda, the literature on self-poisonings is older and almost exclusively from major hospitals in the capital, Kampala. The trend toward pesticide ingestion as a means of self-harm has steadily increased since 1970 [2]. Tibbutt, in 1999, described cases of poisoning reported by 40 rural health centres in Uganda, with pesticides being the

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most common cause resulting in a 30% case fatality rate [3].

Although self-poisoning is estimated to account for 0.53% of all deaths in Uganda and an estimated loss of almost 282 disability adjusted life-years per year, more research is needed from rural centres to improve these estimates [4]. We describe the characteristics of self-poisonings at a rural district hospital in southwestern Uganda to better understand the needs of the region and to educate health workers on poison management.

Methods

In conjunction with Karoli Lwanga (Nyakibale) Hospital in Rukungiri District, Uganda, Global Emergency Care Collaborative began piloting a training programme in emergency care for non-physician clinicians in 2009. These emergency care providers (ECP) work in the emergency centre (EC) of Nyakibale Hospital. If necessary, they may transfer patient care to physicians who admit to the medical wards of the hospital. After three years of implementing the training curriculum that includes poison management, a quality assurance database was created to monitor patient outcomes. The Uganda National Council for Science and Technology provided Institutional Review Committee authorisation for this study.

The EC quality assurance database was set up at Karoli Lwanga Hospital on March 24, 2012. A search of the database for diagnoses containing “poison”, “tox”, “overdose”, “medication”, “exposure” and “suicide” was performed from this start date to December 30, 2013. Charts were retrieved for these records, and all personal identifying information was removed from the charts. Charts were excluded if the final diagnosis was confirmed to be an alternate diagnosis either unrelated to self-poisoning or related to recreational ethanol use.

Extracted data included age, gender, duration of exposure prior to presentation, poison encountered, intentionality, physical examination findings, vital signs, Glasgow Coma Scale (GCS) score, decontamination strategies at home and in the EC, antidote administration, and follow-up status three days after admission.

After data were recorded in the Microsoft Excel® spreadsheet, age, gender, intentionality and condition upon follow-up were analysed. Data regarding the type of poison encountered was collected, and the number of cases for each poison was recorded.

In our review, we recorded both home and EC decontamination. Among those who received EC decontamination, we determined the number of cases that had contraindications such as late presentation or poor mental status. We measured mental status with the GCS, which has been found to have prognostic value regarding mortality in organophosphorous and carbamate pesticides (OCP)-poisoned patients [5]. Dose and frequency of atropine administration was also measured. From those administered atropine, we assessed how many had bradycardia or respiratory secretions.

Results

A total of 192 records of poisoning were generated from the query, and 188 had charts available for full review. A total of 92 records out of the 188 were excluded for the following reasons: recreational ethanol intoxication (n = 80; 42.6%), non-malicious food poisoning (n = 8; 4.3%), confirmed meningitis (n = 1; 0.5%), glass pieces in food (n = 1; 0.5%) and microscopy positive malaria (n = 2; 1.0%). This left 96 cases that met the inclusion criteria.

Of the self-poisoning cases, 73 were male (76.0%). Fifty-five cases (58.5%) were definitively thought to be intentional ingestions, 23 (24.5%) were considered accidental, and the remainder were difficult to discern. Of the 96 cases, 60 (62.5%) were associated with pesticide poisoning. Other poisons included rat poison (n = 9; 9.4%, including super-warfarins and zinc phosphide), hydrocarbons (n = 7; 7.3%), misuse of medications (n = 4; 4.2%), and accidental smoke inhalation (n = 1, 1.0%).

Table 1
Number of patients with contraindications who were approached for decontamination (n = 35).

Decontamination	Cases n	Post-ingestion time ≥2 h n (%)	Poor mental status n (%)
Charcoal	5	4 (80.0)	0
Gastric Lavage	22	12 (54.5)	14 (63.6)
Charcoal + Gastric Lavage	8	2 (25.0)	1 (12.5)

Nine patients were administered decontamination treatments at home prior to arrival in the EC. These treatments included: milk (n = 4), cow dung (n = 2), water (n = 2), and pineapple juice (n = 1). None of these patients died. Thirty-five patients were approached for decontamination in the EC: 20 had gastric lavage (GL) alone, five had charcoal tablets alone, eight had both, and two refused GL. Table 1 demonstrates patients who received decontamination in the EC who had contraindications of late arrival or altered mental status.

Of the 35 patients approached for decontamination, there were two deaths, with a fatality rate of 5.7%. One presented six hours post-ingestion with a GCS of three. The other had an unknown ingestion time with a GCS of four. Those who did not undergo decontamination in the EC had a fatality rate of 8.3%.

Atropine was given to a total of 49 patients. Table 2 demonstrates the patients with indications for atropine administration. There were 19 patients who received atropine but did not have bradycardia or secretions (mean = 10.95 mg, range 2–21 mg). Three patients had bradycardia or secretions but never received atropine.

Of the 96 self-poisoned patients, 19 (19.8%) were lost to follow-up. Sixty-one patients (63.5%) felt better on follow-up. The remainder reported feeling the same (2.1%) or worse (1.0%). There were a total of seven deaths (7.3%) (Table 3).

Discussion

Our data represents one of few published studies on the management of self-poisonings in a rural setting in sub-Saharan Africa. Self-poisonings, including ethanol, accounted for just over 2% of the total 8755 EC patient visits. By far, the dominant class of poison in our study was pesticides, specifically alpha-2 agonists (AA) and OCPs. Previous studies on deliberate self-harm in Uganda demonstrate pesticides as being the most popular method of choice with a predominantly male cohort [6].

Although charcoal and GL may be instituted within two hours of ingestion in a consenting patient, these interventions have no clear benefit. Most experts agree that GL has limited utility in late-presenting ingestions or hydrocarbon co-ingestion which may increase aspiration risk [7]. GL may result in these complications: gastro-intestinal bleed, aspiration, hypoxia, oesophageal perforation and laryngeal spasm [8].

Although the ECPs at this site were taught decontamination contraindications including the need for consent, there were seven patients who could not provide consent but still underwent GL (GCS scores of 3–6). There were two deaths among patients who underwent contraindicated GL. The odds ratio of death in those who received GL with at least one contraindication was 0.64 (95% CI 0.12–3.36, $p > 0.05$),

Table 2
Number of patients who had an indication for atropine prior to atropine administration (n = 49).

Indication	n (%)
Bradycardia	9 (18.4)
Secretions/Respiratory Distress	15 (30.6)
Bradycardia and Secretions/Respiratory Distress	6 (12.2)
Unknown	19 (38.8)