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Brief Report

Validation of a 6-hour observation period for cocaine body stuffers☆

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Abstract Often, patients are brought in to the emergency department after ingesting large amounts of cocaine in an attempt to conceal it. This act is known as *body stuffing*. The observation period required to recognize potential toxic adverse effects in these patients is not well described in the literature. We sought to validate a treatment algorithm for asymptomatic cocaine body stuffers using a 6-hour observation period by observing the clinical course of cocaine body stuffers over a 24-hour period. A retrospective chart review was performed on all patients evaluated for witnessed or suspected stuffing over 2 years using a standardized protocol. One hundred six patients met final inclusion criteria as adult cocaine stuffers. No patients developed life-threatening symptoms, and no patients died during observation. In our medical setting, stuffers could be discharged after a 6-hour observation period if there was either complete resolution or absence of clinical symptoms.

1. Introduction

According to the National Survey on Drug Use and Health, approximately 2.1 million people in the United States use cocaine each month [1]. Cocaine abuse is common in patients presenting to the emergency department (ED). Occasionally, patients are brought to the ED after swallowing large amounts of cocaine in an attempt to conceal it from officials to evade prosecution. This act is known as *body stuffing*. In contrast, the act of swallowing illegal drugs for smuggling is termed *body packing*. Body packers ingest large amounts of meticulously wrapped illegal drugs, and risk for rupture or leakage is low. Whereas body packers are at low risk for leakage or rupture of packages, body stuffers have a higher risk of rupture or leakage, as the drugs are either inadequately wrapped or unwrapped. Therefore, body stuffers pose a challenging medical dilemma in regards to time to potential toxic effects from the ingested drug and the duration of appropriate medical observation.

Cocaine is the most common drug involved in body stuffing [2]. Time to peak concentration after cocaine ingestion is 50 to 90 minutes, and it follows first-order elimination with a duration of action of 30 to 60 minutes [3-5]. Most patients should develop symptoms within the above time frame. Other drugs commonly involved in body stuffing include other stimulants and opioids [2]. In one study that analyzed drug packages seized from body

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stuffers, 96% contained crack cocaine or cocaine HCl, and 4% contained nonnarcotic powder or heroin (diacetylmorphine) [2].

There are multiple difficulties that arise in determining the best treatment algorithm for body stuffers. An accurate history is often difficult to obtain when dealing with body stuffers, as the circumstances of arrest usually involve criminal charges. Furthermore, optimal treatment protocols for body stuffers remain nonvalidated. Reported protocols vary in treatment regimen (activated charcoal and polyethylene glycol solution) and observation period from 6 to 72 hours [6,7]. There are reports of delayed sequelae; however, most of these cases were not monitored in a medical setting [7]. The observation period required to recognize potential toxic adverse effects in these patients is not well described in the literature. Algorithms for observation focus on type of packaging and amount ingested, but historical accuracy is often flawed. We sought to validate a treatment algorithm as outlined by Sporer and Firestone [6] in 1997 for asymptomatic cocaine body stuffers using a 6-hour observation period by observing the clinical course of cocaine body stuffers at our facility over a 24 hour period.

2. Methods

A retrospective chart review was performed on all patients evaluated for witnessed or suspected stuffing over a 2-year period from July 1, 2003, to June 30, 2005, who were treated using an institutional body stuffer protocol (Fig. 1). The setting was an urban county hospital police-receiving center with 54,000 patient visits per year. Local Institutional Review Board protocol approval was obtained.

Chart abstraction was performed by 2 independent trained physician abstractors using standardized Excel spreadsheet. All patients suspected of stuffing were identified by searching the computerized ED log for the following terms: *cocaine ingestion*, *stuffers*, *cocaine*, *crack*, and *stuff*. These individual charts were reviewed by abstractors to identify inclusion criteria that required clinical suspicion for

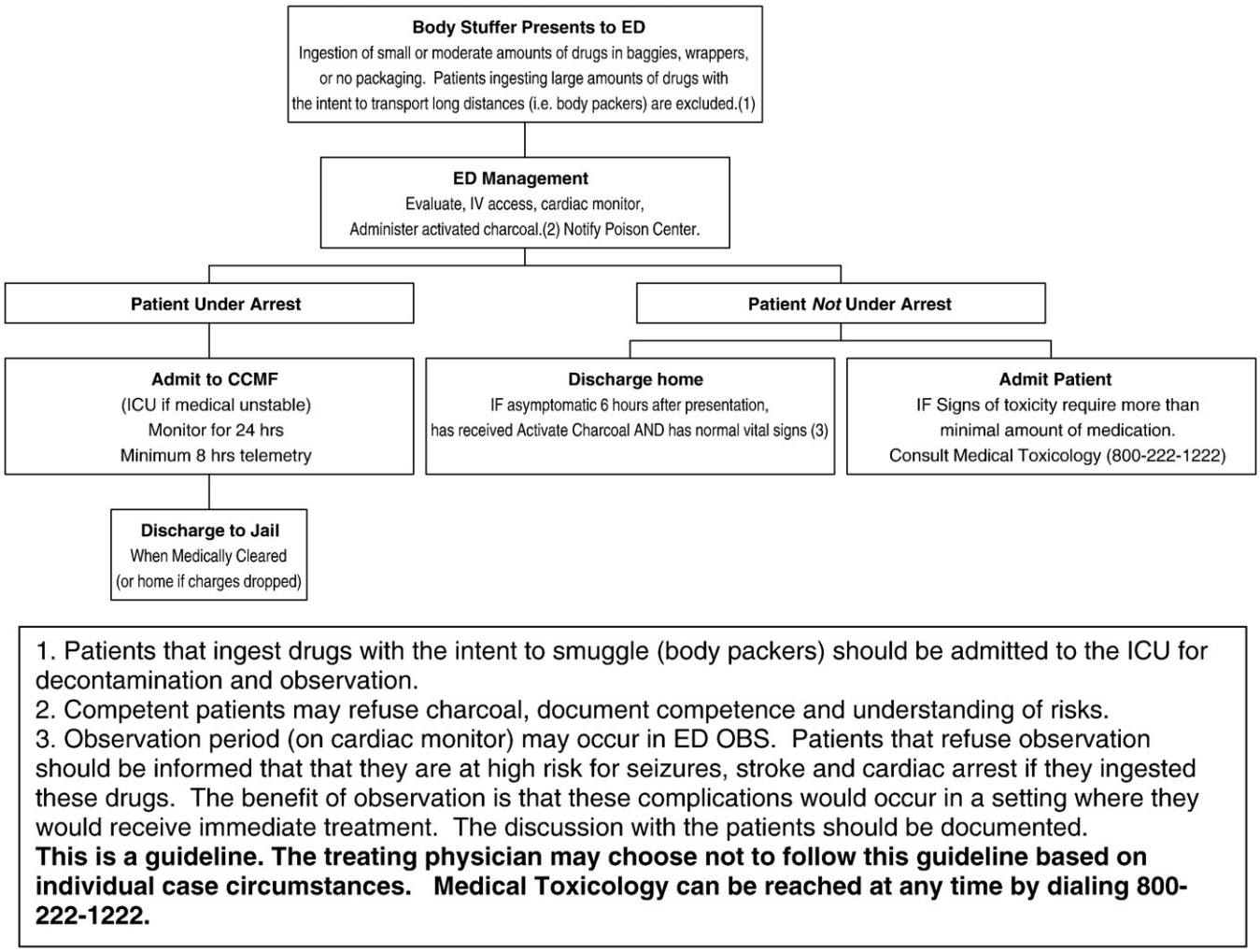

Fig. 1 Body stuffer guideline.

body stuffing, defined as witnessed, confessed, or suspected stuffing to avoid detection by authorities. Patients were excluded if they were younger than 18 years, did not admit to stuffing cocaine, were using cocaine recreationally, or were body packing. Patient data were deidentified. Demographics, drug, amount, type of wrapping, symptoms of intoxication, treatment, activated charcoal administration, changes in observation, drug screen, witnessed or unwitnessed ingestion, and disposition were abstracted from written case histories scanned into a hospital record system. To validate that patients were still alive after discharge, we checked for revisit to the hospital at a later date. Primary outcome was a *serious event* defined as seizure, arrhythmia, or death.

Patients were treated according to a body stuffer protocol, which requires 6 hours of observation and activated charcoal administration in the ED (Fig. 1). If patients were in custody, they were admitted to a medical ward for 24 hours. Any unstable patient was admitted to an intensive care setting. Patients without evidence of clinical symptoms (altered mental status, tachycardia, hypertension, seizures, or arrhythmias) who were not in custody could be discharged home at 6 hours with normal vitals.

Our primary outcomes were descriptive. Categorical data are presented as proportions with 95% confidence intervals, and continuous variables are presented as medians and ranges. As we did not have an a priori hypothesis, we did not perform formal power calculations. Data were analyzed using JMP 7 (2007; SAS, Cary, NC).

3. Results

Upon initial computer search, 1178 patients were identified using the search terms defined above. We identified 153 patients as suspected stuffers after individual record review. Nine patients were excluded because of age (<18 years). Of the remaining 144 patients, 38 were excluded because they were not suspected of stuffing cocaine or a cocaine mixed product, or because the product stuffed was unknown. One hundred six patients met final inclusion criteria as adult cocaine stuffers (Fig. 2). Most patients (88%) were male with a median age of 27 (range, 18-52) years. More than half (63%) of the ingestions were witnessed, and a substantial number ingested more than cocaine. Fifteen patients coingested heroin; 6, methamphetamine; and 2, marijuana. We attempted to quantify number of packets and quantity of drug ingested; but because of variability of documentation and reporting, these were not included in the data analysis. Of the 57% (60/106) of patients with packaging recorded, 43% (46/106) were unknown, 28% (30/106) were in bags, 7% (7/106) were wrapped, 5% (5/106) were balloons, and 17% (18/106) recorded no wrapping. Twenty percent had a urine drug screen performed, and 71% of these tests were positive for cocaine.

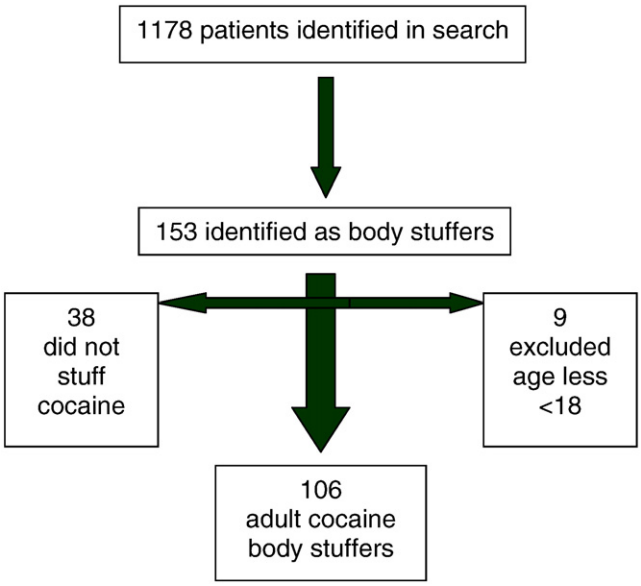

Fig. 2 Patients in search.

Table 1 Patient symptoms

Symptoms	No.
Abdominal pain	3
Agitated	7
Anxiety	3
Bradycardia	4 (<60 BPM)
Chest pain	5
Decreased level of consciousness	1
Diaphoretic	4
Dizzy	2
Hypertensive	22 (>130/80 mm Hg)
Hypoxia	2
Mild tachycardia	35 (100-120 BPM)
Moderate tachycardia	16 (>120 BPM)
Nausea	5
Seizure	1
Shortness of breath	2
Vomiting	3
Total	115

Upon presentation, 71.7 (62%-80%)of patients had one or more symptoms (Table 1). The most common symptoms were mild tachycardia and hypertension. No patients were hyperthermic. During observation, 13% (95% confidence interval, 8-21) of patients developed symptoms; and all had resolution of symptoms at discharge. A single patient had a seizure upon presentation.

Most patients (76%) were given activated charcoal. Other treatments during ED stay and inpatient hospital observation included whole bowel irrigation with a polyethylene glycol solution (golytely) (86/122) and benzodiazepines (22%, 27/122). Other less common treatments included antipsychotics [n=1], gastric lavage [n=2], naloxone [n=2], nitroglycerin [n=1], antihistamines [n=2], and angiography [n=1].

Overall, 52% (55/106) of patients who were suspected stuffers had a return visit at a later date documenting survival. Eighty-one patients were observed for more than 24 hours. Of this group, 42 were noted to have a revisit to the hospital at a later date. Eighteen patients were observed between 6 and 24 hours, and 8 of these revisited the hospital at a later date. Three patients were discharged or left against medical advice from the ED during an observation period less than 6 hours, and 2 of these patients revisited the hospital at a later date. The duration of observation could not be determined for 4 patients, but 3 of these patients had a documented follow-up visit. Therefore, we were able to document a minimum of 24 hours of observation or a follow-up visit for 94 of 106 subjects (89%).

No patients developed life-threatening symptoms (seizures, arrhythmias, hyperthermia, or respiratory depression) during the 6-hour observation. A single patient had an indeterminate troponin during observation. No patients died during ED or forensic observation periods.

4. Discussion

Treating body stuffers in an ED or medical custody setting is challenging. Patient history of amount, type of drug ingested, and packaging is often unreliable and unclear. Imaging is controversial and usually not helpful in suspected stuffers, and patients are at risk of severe morbidity and mortality with significant ingestions [6,8-10].

Our study supports the effectiveness of a 6-hour observation protocol for suspected cocaine body stuffers. Most subjects in our study were observed for a minimum of 24 hours, and we found no adverse events during this observation period. Of the subjects who were observed for less than 6 hours, all but one had a return visit to our health care system subsequent to their index ED visit. Although we cannot verify that these subjects had no adverse events after the ingestion, there were no fatalities among these subjects. We therefore conclude that severe adverse effects are very unlikely in patients who are asymptomatic during a 6-hour observation period.

The optimal management for body stuffers has not been formally defined. Protocols must balance the need for safety with the appropriate use of resources. Protocols also vary in observation time from hours to days. Proponents of longer observation periods cite cases like that presented by GA Norfolk when an inmate was found dead in her cell 11 hours after ingesting a packet containing methamphetamine or cocaine [11]. However, her clinical status during observation was not reported; and she was observed for less than 3 hours with a single recheck of her vital signs at 7 hours after her presentation. It is possible that there were symptoms or signs of toxicity that might have allowed earlier detection had she been more closely monitored [11]. Sporer and Firestone's [6] case series showed that patients who were asymptomatic after a 6-hour observation period did well; however, follow-up beyond 6 hours was not obtained. In our study, most patients were observed for more than 24 hours without development of seizures or arrhythmias and had a documented return visit to the hospital, proving survival.

This study is limited by its retrospective nature specifically reliability of self-reporting and physician reporting. There is no way to confirm ingestion, dose, packaging type, and time of ingestion in these patients. We cannot prove that these patients ingested significant, if any, amounts of cocaine. We could have missed patients in our study. Our primary outcome was a 24-hour observation period as opposed to overall mortality; however, most patients that stuff cocaine will present with symptoms within 24 hours [6,8,12-14].

This study adds to the current clinical experience with cocaine body stuffing after a protocol was successfully implemented. Most patients in this series who developed signs of cocaine toxicity exhibited symptoms upon presentation.

For patients observed beyond 6 hours, none developed new life-threatening symptoms. Most of these patients were observed for more than 24 hours in a monitored medical setting in police custody. No patient deteriorated during this subsequent observation period; therefore, in our medical setting, stuffers could be discharged after a 6-hour observation period if there is either complete resolution or absence of clinical signs and symptoms. If not, they should be observed in a monitored clinical setting.

Acknowledgment

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