

Management of body stuffers presenting to the emergency department

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Objective The aim of this study was to establish a management protocol for body stuffers presenting to the emergency department.

Methods This is a retrospective observational case series of patients presenting to the emergency department of a large inner-city hospital as 'body stuffers' during the period between 1 January 2006 and 31 October 2011, irrespective of the type of drug ingested. We reviewed demographic data, ingestion characteristics, clinical progress and outcome.

Results A total of 126 patients were included in the study, with a mean age of 31 ± 8.10 years (range 15–58 years), among whom 106 were male (84%). Drugs ingested were as follows: heroin ($n = 61$, 48%), cocaine ($n = 58$, 46%), other drugs ($n = 20$, 16%) and unknown ($n = 10$, 8%). Of the patients, 23 (18%) ingested more than one drug. At presentation, 96 had features of drug toxicity. The presence of depressant drug toxidrome was more commonly observed among heroin users, but stimulant drug toxidromes were seen across all groups. Of the patients, 12 developed changes in clinical state, with a mean time to development of symptoms of 2 h 50 min \pm 1 h 39 min (range from 1 h 0 min to 5 h 36 min). Abdominal radiography showed the presence of foreign bodies in 8% of the tests

performed, and packets were recovered from one patient who underwent gut decontamination.

Conclusion Patients developed new or worsening features of drug toxicity within 6 h of presentation. Toxidromes observed are often not drug/class specific, and treatment including gut decontamination and radiography do not aid in expediting discharge. We propose an observation period of 6 h from the time of admission as the time required if the patient is asymptomatic or there is resolution of presenting signs and symptoms. *European Journal of Emergency Medicine* 23:425–429 Copyright © 2016 Wolters Kluwer Health, Inc. All rights reserved.

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Introduction

Body stuffers, body packers and body pushers are terms used to describe people who hide illicit drugs inside their bodies in an attempt to avoid detection by customs/border control agencies and/or the police. Each group is distinct from the other in the amount of drug ingested, the integrity of packaging used and the reason for concealment [1,2]. Body stuffers are usually street-level dealers and/or drug users who ingest drugs that are often inadequately wrapped in materials such as plastic wraps, plastic bags, cellophane paper, aluminium foil, glassine crack vials and condoms [3–5]. Body packers swallow drug-filled packets and illegally transport drugs across international borders [6], and body pushers conceal drugs in the rectum or vagina [7]. Generally the packaging used by body packers and pushers is more substantial and, although the package may rupture [8], this is much less likely than in body stuffers [4].

Body stuffers face the risk of liberating significant amounts of the drug from the loose packaging, which is

not designed for gastrointestinal transit [4,5,9–12], and fatal cases involving body stuffers have been reported previously [1,3,12,13]. In addition, the toxic effects that manifests can be varied and unpredictable, as street drugs are often adulterated with other substances, some of which may have their own undesirable effects [14]. Knowledge of the drugs ingested, the materials used for packaging and details of any other coingestants is useful in determining how to manage these patients. However, this information can be difficult to obtain because of a number of factors (lack of cooperation from the patient or altered mental and behavioural states), and as a result, predicting the clinical course, initiating appropriate management and determining the required duration of medical observation is difficult.

Previous case series on body stuffers assessing at the clinical course among these patients have looked at single-drug body stuffers – cocaine [4,9], heroin [15] or methamphetamine [5] stuffers. These studies have shown that the symptoms of drug toxicity tend to appear

within 1–2 h of ingestion [4,15] and the majority of these symptoms are of mild acute drug toxicity. However, a small number of cases resulted in severe morbidity and/or mortality, highlighting the potential for significant harm associated with body stuffing. Moreira *et al.* [9] proposed an observation period of 6 h as the time required until discharge if there was either (i) the absence of clinical symptoms during this observation period, or (ii) complete resolution of symptoms that were present on admission or that occurred during the observation period.

We report here our experience with body stuffers presenting to our large inner-city hospital, irrespective of what drug(s) was reported to have been ingested, in an attempt to determine whether the 6 h observation period after presentation to the emergency department (ED) recommended by previously published studies is appropriate in clinical scenarios in which the drug ingested is not known.

Materials and methods

Data on all patients presenting to the ED of our large inner-city hospital with toxicology-related problems are entered prospectively into a purpose-designed database [16]. This database was searched for patients classified as 'body stuffers', who presented between 1 January 2006 and 31 October 2011. A 'body stuffer' was defined as any person who, on obtaining the history, admitted to or was suspected of ingesting any illicit drug that was wrapped in a packet. Patients presenting with a history in keeping with a diagnosis of a 'body packer', defined as someone who had swallowed drug-filled packets and illegally transported drugs across international borders [6], were excluded from this study. The study was conducted in compliance with a protocol that has received Institutional Review Board approval.

The following information, as obtained by the ED clinician, was extracted from the database (i) basic demographic data (age and sex), (ii) time of presentation to the ED, (iii) reported drug(s) ingested, (iv) reported quantity of drug(s) ingested, (v) reported material used for wrapping, (vi) reported time of ingestion, (vii) signs and symptoms present on admission and/or that occurred during hospital stay, (viii) diagnostic radiological and/or other investigations performed and their results, and (ix) length of stay in hospital. No analytical confirmation for the drugs ingested was performed.

These data were then reviewed to determine whether the patients developed signs and/or symptoms of a drug toxidrome in keeping with absorption of the class of drug that they were suspected of body stuffing. These were pre-defined as (i) stimulant toxidrome: tachycardia (heart rate ≥ 100 beats/min), hypertension (systolic blood pressure ≥ 140 mmHg), pyrexia (temperature $> 38^\circ\text{C}$), agitation, chest pain and/or mydriasis (5–7 mm), and (ii) depressant

toxidrome: hypoventilation (respiratory rate < 12 breaths/min), low oxygen saturation ($\text{SO}_2 < 95\%$), reduced level of consciousness (Glasgow Coma Scale score < 15) and/or miosis (1–2 mm). The data were analysed to determine whether there was a correlation between the presence of a specific drug toxidrome and the class of drug ingested. A Fisher's exact probability test was used for this.

Results

Patient characteristics

We identified 140 patients as body stuffers. One patient was excluded because of incomplete clinical notes, a further 13 were excluded as the patients were uncooperative and adequate records of clinical assessment could not be achieved. The mean \pm SD age of the patients included in the study was 31 years (± 8.10 years, range 15–58 years). Of the patients, 106 (84%) were male and 20 (16%) were female. Eighty-three (66%) patients admitted to ingesting drugs on obtaining their history. Almost all patients ($n = 123$, 97.6%) were accompanied by the police. The reasons for attendance were as follows: (i) the patient self-reported to the police that he/she had ingested drugs while in custody or at time of arrest ($n = 81$, 64.3%), (ii) they were witnessed or suspected by the police of having ingested drugs ($n = 42$, 33.3%), (iii) they self-presented to the ED with symptoms after ingestion of drugs ($n = 3$, 2.4%).

The details of the drug(s) stuffed were either self-reported or provided by the police. These were as follows: heroin ($n = 61$, 48%), cocaine (powder or crack cocaine, $n = 58$ 46%), other drugs ($n = 20$, 16%) and unknown ($n = 10$, 8%). The 'other drugs' included cannabis ($n = 9$), MDMA ($n = 6$), diazepam ($n = 2$), benzocaine ($n = 1$), codeine ($n = 1$) and methamphetamine ($n = 1$). Of the patients, 23 patients (18%) ingested more than one drug (21, cocaine and heroin; one, cocaine and MDMA; one, diazepam and heroin). Alcohol was consumed around the time of body stuffing by five patients (4%). Details of the material used for wrapping and the number of packets swallowed were also self-reported or police-reported; this information could only be obtained from 62 patients (49%). The wrapping material, in order from most commonly to least commonly used, was plastic bag/cellophane ($n = 28$), cling film ($n = 25$), cigarette paper ($n = 3$), paper ($n = 3$), aluminium foil ($n = 2$) and condom ($n = 1$). Eighty (63%) patients disclosed the quantity of drug ingested, quoted as number of packets (mean 4.9, range 1–25). The time of ingestion was documented in 94 patients (75%), among whom 73 (58%) presented to ED within 2 h of ingestion, 12 (10%) between 2 and 6 h of ingestion and nine (7%) more than 6 h after ingestion. The mean \pm SD time from ingestion to arrival at the ED was 4 h 27 min (± 14 h 44 min, range from 20 min to 124 h).

Clinical presentation

In all, 96 (76%) patients had clinical signs or observations that met the criteria of a drug toxidrome outlined above at the time of presentation and initial clinical contact. Hypertension ($n=38$, 30%), tachycardia ($n=25$, 20%) and agitation ($n=20$, 16%) were the most common signs of drug toxicity seen (Table 1). There were proportionally more symptomatic patients (87%) among heroin body stuffers compared with the other groups (70% for cocaine, 67% for heroin and cocaine, 85% for others, 75% for unknown). Among cocaine body stuffers, hypertension was seen in 38% and tachycardia in 14% of the patients, in keeping with the stimulant drug toxidrome consistent with the drug ingested. However, the two symptoms were also observed in heroin body stuffers, with hypertension being observed in 20% and tachycardia in 23% of patients ($P=1.00$). In contrast to this, the presence of depressant drug toxidromes was observed more commonly among heroin body stuffers, although this also did not achieve statistical significance ($P=0.06$; Table 2). Among patients administering a combination of heroin and cocaine, depressant toxidromes were observed in 29% and stimulant toxidromes in 52%. However, only three patients (14%) exhibited features of both depressant and stimulant drug toxicity. Among the already symptomatic patients, the majority ($n=85$, 89%) had no worsening of their initial symptoms and/or did not develop additional symptoms of toxicity during their hospital stay.

Patients developing symptoms

Twelve (10%) patients showed changes in their clinical state during the admission, 11 of whom already had clinical features of drug toxicity at presentation. In this group, 11 patients developed new clinical features (drowsiness, tachycardia, hypertension, agitation) and one showed worsening of the original features

(drowsiness). The time of onset of these changes (using time of presentation as time zero) and the drugs ingested were as follows: within 2 h ($n=4$, 33%), two heroin, one cocaine, one heroin and cocaine; 2–4 h ($n=5$, 42%), three heroin, one heroin and cocaine, one unknown; 4–6 h ($n=3$, 25%), one heroin, two heroin and cocaine; greater than > 6 h ($n=0$); the mean time to onset of symptoms was 2 h 50 min (± 1 h 39 min, range from 1 h 0 min to 5 h 36 min). The one patient who was asymptomatic at the time of presentation had ingested heroin 20 min before attending the hospital and showed an acute drop in his Glasgow Coma Scale score to 3 an hour into his time in the ED.

Investigations and treatment

Further investigations and/or treatment were offered to 59 patients, but 22 patients refused intervention. The investigations performed included the following: abdominal radiography ($n=37$), chest radiography ($n=18$) and continuous cardiac monitoring ($n=15$). Treatments included single-dose activated charcoal ($n=11$), benzodiazepines ($n=7$), naloxone ($n=6$), whole bowel irrigation ($n=5$) and oxygen therapy ($n=3$).

All patients who agreed to further management underwent abdominal radiography to assist with visual identification of the ingested drugs/packages. Foreign bodies were visible in three (8%) patients. Among patients undergoing gut decontamination, it was possible to recover all the packets that the patient had declared only in one patient.

Patient outcome

Patients were medically cleared if they remained asymptomatic from the time of presentation, or if the initial symptoms had resolved. This was determined by the clinicians looking after the patient – mostly ED

Table 1 Range of signs and symptoms observed on admission by type of drug ingested

	Heroin ($n=40$) [n (%)]	Cocaine ($n=37$) [n (%)]	Heroin and cocaine ($n=21$) [n (%)]	Others ($n=20$) [n (%)]	Unknown ($n=10$) [n (%)]	Total (% of total) ($n=126$) [n (%)]
Asymptomatic	5 (13)	11 (30)	7 (33)	3 (15)	4 (25)	30 (24)
Signs						
Tachycardia (HR > 100 beats/min)	9 (23)	5 (14)	2 (10)	7 (35)	2 (20)	25 (20)
Bradycardia (HR < 60 beats/min)	2 (3)	4 (11)	0 (0)	2 (10)	0 (0)	8 (6)
GCS < 15	6 (15)	3 (8)	3 (14)	0 (0)	2 (20)	14 (11)
Hypertension (SBP > 140 mmHg)	8 (20)	14 (38)	5 (24)	7 (35)	4 (40)	38 (30)
Hypoxia (SO ₂ < 95%)	1 (3)	1 (5)	1 (5)	0 (0)	0 (0)	3 (2)
Hypoventilation (RR < 12 breaths/min)	1 (3)	0 (0)	0 (0)	0 (0)	1 (10)	2 (2)
Pyrexia (temperature > 38°C)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
Miosis (1–2 mm)	6 (15)	0 (0)	2 (10)	1 (5)	0 (0)	9 (7)
Midriasis (5–7 mm)	4 (10)	4 (11)	0 (0)	3 (15)	0 (0)	7 (6)
Symptoms						
Chest pain	0 (0)	3 (8)	3 (14)	4 (20)	0 (0)	10 (8)
Abdominal pain	4 (10)	1 (5)	2 (10)	4 (20)	0 (0)	11 (9)
Drowsiness	8 (20)	3 (8)	5 (24)	1 (5)	0 (0)	16 (13)
Agitation	4 (10)	6 (16)	6 (29)	3 (15)	1 (10)	20 (16)
Nausea and vomiting	3 (8)	4 (11)	0 (0)	2 (10)	0 (0)	12 (10)
Others symptoms	9 (23)	3 (8)	2 (10)	0 (0)	2 (20)	16 (13)

GCS, Glasgow Coma Scale; HR, heart rate; RR, respiratory rate; SBP, systolic blood pressure.

Table 2 The presence of depressant or stimulant toxidrome by type of drug ingested

	Presence of toxidrome	Cocaine (n = 37)	Heroin (n = 40)	P-value
Stimulant toxicity	No	16	18	1.00
	Yes	21	22	
Depressant toxicity	No	32	27	0.06
	Yes	5	13	

doctors or clinical toxicologists. Ninety (72%) patients were discharged within 6 h, 13 (10%) between 6 and 12 h, and 13 (10%) between 12 and 24 h. Of the patients, ten (8%) required a stay of more than 24 h. Nineteen patients (15%) self-discharged against medical advice (13 within 6 h, two between 6 and 12 h, four between 12 and 24 h). The mean duration of hospital stay was 5 h 1 min (\pm 8 h 5 min, range from 0 h 30 min to 22 h 00 min) in the group that remained asymptomatic from presentation to discharge ($n = 42$), 9 h 13 min (\pm 19 h 49 min, range from 0 h 30 min to 22 h 35 min) in the group that was symptomatic at presentation with no worsening of clinical symptoms until the time of discharge ($n = 72$), and 15 h 58 min (\pm 8 h 22 min, range from 5 h 0 min to 29 h 15 min) among those who developed worsening or new features of drug toxicity (12 patients).

Discussion

In this study, we assessed the case records of all body stuffers and did not limit ourselves to assessing only predetermined drugs. Although previous studies have highlighted the potential dangers associated with body stuffing, these have concentrated only on single-drug cases [1,4,9–13]. The key objectives when faced with a case are to identify those who are at risk of developing new or additional signs of drug toxicity and also to determine the appropriate period of observation before the patient can be declared fit for discharge.

When clinical features of drug toxicity were present, these often did not correspond with the toxicity that would have been expected from the type of drug ingested. Patients commonly exhibited a combination of both stimulant and depressant drug toxidromes. In particular, stimulant drug toxidromes were seen universally across all drug groups, and we did not find that the presence of these symptoms was specific to body stuffers of cocaine or other stimulant drugs. The presence of depressant drug toxidromes was more commonly observed among those who had ingested heroin, although this also did not achieve statistical significance. These findings may be due to a number of factors including (i) unclear history obtained or reluctance of the patient to volunteer the information, (ii) ingestion of a different drug from what they had been sold, or (iii) the presence of an adulterant in the drugs. In terms of overall management, this finding does not change the need for appropriate treatment of

symptoms and the need for monitoring. However, it underlines the importance of close clinical observation of these patients and the need to be aware that patients may exhibit features of drug toxicity that may not be expected from the drug(s) ingested by them.

Utility of radiography and gut decontamination

We assessed the usefulness of radiological investigations to identify packets and also of gut decontamination to remove them. We found that imaging to search for ingested packets has a limited role, and the yield is low. None of the chest radiographs were able to confirm the presence of packets, and less than 8% of abdominal radiographs did so. This is similar to the findings of the study by West *et al.* [5], who reported that no packages were identified on radiography, computed tomography or ultrasonography in the 23 body stuffers who underwent these procedures. All declared packets were recovered in only one patient who underwent gut decontamination; however, the packets were not identified on the abdominal radiograph of the patient. It is therefore not possible to use either method to confirm ingestion or to determine the endpoint of therapy and discharge.

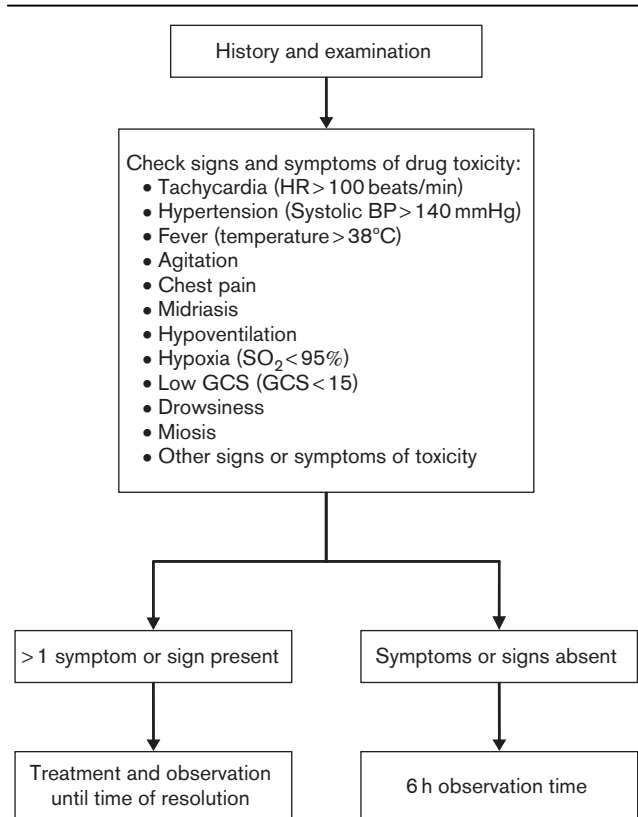
Duration of observation

It is often difficult to determine the length of time necessary to observe body stuffers, especially if they are asymptomatic at the time of presentation. In this study, 12 (10%) patients showed changes in their clinical state during the admission, one of whom was initially asymptomatic. All changes occurred within 6 h of presentation. This finding is in line with a previous case series by Moreira and colleagues, who reviewed the clinical course of 106 cocaine body stuffers. In their study, no patient developed life-threatening symptoms during the 6 h of observation, and also during extended observation in those staying beyond this time period [9]. We therefore propose the algorithm presented in Fig. 1 for the management of body stuffers, with the start time being the time of presentation to the ED.

Limitations

There are a number of limitations to the present study. The main limitation is that this study is a retrospective case note review. This makes the study reliant on accurate documentation at the time of clinical review. Unless stated, it is not possible to ascertain from case notes whether the absence of information is because of the lack of documentation or because the information was not available at the time. An example of this is the group of patients who refused examination or observation. We elected to exclude this group from the study, unless some information on their clinical state was available for interpretation. Uncooperative patients, however, are commonly encountered in clinical practice, and it is this group that is potentially at greater risk for clinical deterioration. It will therefore be important to include this

Fig. 1



Algorithm for the management of body stuffers. GCS, Glasgow Coma Scale; HR, heart rate.

group in future studies. Secondly, we identified that symptoms do not often correlate with the ingestion history, with patients often exhibiting features of both depressant and stimulant toxicity. This may again be a result of the difficulty in obtaining an accurate ingestion history at the time of presentation. Thirdly, there was an absence of routine follow-up among these patients once they were discharged from the hospital. It is entirely possible that the patient may have subsequently deteriorated and presented to another healthcare facility. To overcome these limitations, we would suggest that future studies be prospective in design to allow for more accurate data collection.

Conclusion

In this study we have shown that a significant minority of body stuffers go on to develop clinical features consistent

with drug toxicity after presentation, which occurs within 6 h of presentation to the ED. These results support previous studies focusing on single-drug ingestion by body stuffers (cocaine, heroin and methamphetamine). We therefore propose that 6 h of observation from the time of presentation to the ED is sufficient for body stuffers irrespective of the drug(s) involved, so long as they remain asymptomatic with no clinical features of drug toxicity or any initial symptom of drug toxicity settles within this 6 h observation period.

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Conflicts of interest

There are no conflicts of interest.

References

- Norfolk GA. The fatal case of a cocaine body-stuffer and a literature review – towards evidence based management. *J Forensic Leg Med* 2007; **14**:49–52.
- Booker RJ, Smith JE, Rodger MP. Packers, pushers and stuffers – managing patients with concealed drugs in UK emergency departments: a clinical and medicolegal review. *Emerg Med J* 2009; **26**:316–320.
- Fineschi V, Centini F, Monciotti F, Turillazzi E. The cocaine “body stuffer” syndrome: a fatal case. *Forensic Sci Int* 2002; **126**:7–10.
- Sporer KA, Firestone J. Clinical course of crack cocaine body stuffers. *Ann Emerg Med* 1997; **29**:596–601.
- West PL, McKeown NJ, Hendrickson RG. Methamphetamine body stuffers: an observational case series. *Ann Emerg Med* 2010; **55**:190–197.
- Mandava N, Chang RS, Wang JH, Bertocchi M, Yrad J, Allamaneni S, *et al.* Establishment of a definitive protocol for the diagnosis and management of body packers (drug mules). *Emerg Med J* 2011; **28**:98–101.
- Schaper A, Hofmann R, Bargain P, Desel H, Ebbecke M, Langer C. Surgical treatment in cocaine body packers and body pushers. *Int J Colorectal Dis* 2007; **22**:1531–1535.
- Gill JR, Graham SM. Ten years of “body packers” in New York City: 50 deaths. *J Forensic Sci* 2002; **47**:843–846.
- Buchanan J, Moreira M, Heard K, Buchanan J, Moreira M, Heard K, *et al.* Response to Letter to the Editor: validation of a 6-hour observation period for cocaine body stuffers. *Am J Emerg Med* 2011; **29**:471–472.
- Schmidt S, Hugli O, Rizzo E, Lepori D, Gudinchet F, Yersin B, *et al.* Detection of ingested cocaine-filled packets – diagnostic value of unenhanced CT. *Eur J Radiol* 2008; **67**:133–138.
- Chang C, Grush A, McClintock DE, Nahid P, Tang JF. Unusual finding on bronchoscopy: trauma patient identified as a body stuffer. *J Clin Anesth* 2006; **18**:628–630.
- Püschel K, Stein S, Stobbe S, Heinemann A. Analysis of 683 drug packages seized from “body stuffers”. *Forensic Sci Int* 2004; **140**:109–111.
- Kashani J, Ruha AM. Methamphetamine toxicity secondary to intravaginal body stuffing. *J Toxicol Clin Toxicol* 2004; **42**:987–989.
- Riggs D, Weibley RE. Acute toxicity from oral ingestion of crack cocaine: a report of four cases. *Pediatr Emerg Care* 1990; **6**:24–26.
- Jordan MT, Bryant SM, Aks SE, Wahl M. A five-year review of the medical outcome of heroin body stuffers. *J Emerg Med* 2009; **36**:250–256.
- Greene SL, Wood DM, Gawarammana IB, Warren-Gash C, Drake N, Jones AL, Dargan PI. Improvement in the management of acutely poisoned patients using an electronic database, prospective audit and targeted educational intervention. *Postgrad Med J* 2008; **84**:603–608.