

Pharmacobezoars: A Rare Entity

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ABSTRACT

A review of a rare entity, pharmacobezoars, also known as medication bezoars are mainly related to over-dosage of a drug or due to the pharmaceutical formulation of a drug product. Certain medications such as antacids, enteric coated aspirin, laxatives, nifedipine, and quetiapine have a propensity to form bezoars. Various case-reports have been published on bezoar formation following extended release or sustained-release formulations. The formation of these bezoars cannot just be attributed to the pharmaceutical formulation of the drug. There are various anatomical, physiological, and pathological factors involved in their formation. The symptoms are mainly gastro-intestinal, abdominal pain or discomfort being the most common. It may present as intestinal obstruction in many cases since diagnosis of pharmacobezoars is difficult at early stages. A CT-scan or endoscopy may be performed for a definitive diagnosis. Treatment is mostly dependent on the location of the bezoar and is surgical. Pharmacobezoars, though rare may be fatal at times and wider research into this topic is warranted.

Keywords: Medication bezoars, Drug over-dosage, Pharmaceutical formulations, Extended-release.

INTRODUCTION

Nanobiocatalysts Pharmacobezoars, although rare, are potentially problematic manifestation of drug overdose which could prove life threatening or fatal if not treated on time¹⁻³. Bezoar is a mass of any form of unabsorbed material within the gastrointestinal tract which is usually diagnosed radiographically, endoscopically,

intraoperatively, or sometimes postmortem^{4,5}. There has been increasing concern about the development of medication bezoars⁶. Pharmacobezoars are specific types of bezoars that are concretions of pharmaceutical products, such as tablets, suspensions, and/or drug delivery devices, especially insoluble drug delivery systems^{6,7}. Extended- or sustained-release

(SR) products, with significant unabsorbable components, are prone to bezoar formation. Finally, massive tablet ingestions, regardless of formulation, have caused pharmacobezoars. Medications reported to cause bezoars include antacids such as aluminum hydroxide gel, magnesium-aluminum hydroxide, sodium polystyrene sulfonate, sodium alginate, sucralfate, bulk laxatives such as guar gum, cholestyramine, psyllium preparations, enteral feeding formulas, enteric-coated aspirin, iron and meprobamate⁸. Pharmacobezoar formation has been reported in sustained release preparations of nifedipine, theophylline and verapamil and is of concern from an overdose standpoint. They are more commonly associated with the gastrointestinal therapeutic system (GITS), used with nifedipine, isradipine and verapamil controlled-onset extended-release. The same delivery system is used with methylphenidate, oxybutynin, glipizide, and doxazosin^{7,8}. Recently, many cases of pharmacobezoars are being reported in psychiatric patients taking long term therapy with antipsychotics like quetiapine extended-release tablets or antidepressants such as venlafaxine or clomipramine extended release formulations⁹.

The etiology of pharmacobezoar formation is multifactorial. They are frequently associated with predisposing anatomical and functional factors or other affecting conditions such as diabetes mellitus, hypothyroidism, and connective tissue diseases. They commonly occur in patients with prior gastrointestinal surgery or altered

gastrointestinal motility. Increased propensity to form bezoars may be attributable to the drugs solubility, drug effects on gastrointestinal motility and the agglutinating effect of the vehicle⁶⁻⁸.

The presenting symptoms are similar to other bezoars ranging from a dragging or fullness in the upper quadrants to epigastric pain, which is the most common symptom. Nausea, Vomiting, weight loss and early satiety have also been noted. These symptoms are a result of the space-occupying effect of the bezoar mass. Pharmacobezoars may produce additional symptoms related to the active agent of which it is composed. The most frequent complication of bezoars is intestinal obstruction followed by ulceration, haemorrhage, perforation, and peritonitis⁵⁻¹¹.

Effective screening for bezoars is difficult. Pharmacobezoars of radio-opaque medications may be diagnosed (but not excluded) by a plain abdominal X-ray. However, most pharmaceuticals are radio-opaque and a simple X-ray would serve as a poor screening tool². Barium studies may precipitate release of the medication from the bezoar and are not recommended¹². CT scan or gastric endoscopy is the method of choice especially since it may also aid in subsequent management⁶⁻⁸. Since pharmacobezoars are a rare occurrence, it is difficult to justify the expense, resource utilization, and radiation exposure for routine endoscopy or CT scan especially in

patients who exhibit no abdominal signs or symptoms. Definite diagnosis of intestinal bezoars of non-radio-opaque medication is usually only made post mortem⁵. Thus, diagnostic studies are reserved for symptomatic cases only and not employed for routine screening.

Treatment of pharmacobezoars is tricky. It generally varies per the location of the bezoar⁶. Endoscopic removal, surgery or gastric lavage may be employed for the removal of medication bezoars in the upper gastro-intestinal tract. However, bezoars located in the lower gastro-intestinal tract often require surgical removal by means of a laparotomy. Conservative methods such as fluid administration or enema may be tried but cannot classify as definitive treatment^{4, 6,12}.

CONCLUSION

To summarize, pharmacobezoars are uncommon entities which go undiagnosed most of the times. The diagnosis and management is largely dependent on the pharmaceutical agent and the anatomical cause of bezoar formation^{6,8}. It is still unclear as to how the propensity of a product to bezoar formation may be determined. Wider research into this entity will help prevent such rare drug-related adverse events which may also prove fatal in the long-run.

REFERENCES

1. Höjer J., Personne M. Endoscopic removal of slow release clomipramine bezoars in two cases of acute poisoning. *Clin Toxicol (Phila)*. 2008;46:317-19.
2. Lapostolle F., Finot MA., Adnet F., et al. Radiopacity of clomipramine conglomerations and unsuccessful endoscopy: report of 4 cases. *J Toxicol Clin Toxicol*. 2000;38:477-82.
3. Sporer KA., Manning JJ. Massive ingestion of sustained-release verapamil with a concretion and bowel infarction. *Ann Emerg Med*. 1993;22:603-05.
4. Andrus CH., Ponsky JL. Bezoars: Classification, pathophysiology, and treatment. *Am J Gastroenterol*. 1988;83:476-78.
5. England G., Heath KJ., Gilbert JD., et al. Forensic features of Pharmacobezoars. *J Forensic Sci*. 2015;60:341-45.
6. Taylor JR., Streetman DS., Castle SS. Medication Bezoars: A literature review and report of a case. *Ann Pharmacother*. 1998;32:940-46.
7. Stack PE, Thomas E. Pharmacobezoar: An evolving new entity. *Dig Dis*. 1995;13:356-64.
8. Simpson SE. Pharmacobezoars described and demystified. *Clin Toxicol (Phila)*. 2011;49:72-89.
9. Rauber-Lüthy C., Hofer KE., Bodmer M., et al. Gastric pharmacobezoars in quetiapine extended-release overdose: a case series. *Clin Toxicol (Phila)*. 2013;51:937-40.
10. Buckley NA., Dawson AH., Reith DA. Controlled release drugs in overdose. Clinical considerations. *Drug Saf*. 1995;12:73-84.
11. Erdemir A., Ağalar F., Çakmakçı M., et al. A rare cause of mechanical intestinal obstruction: Pharmacobezoar. *Ulus Cerrahi Derg*. 2015;31:92-3.
12. Sclena BJ., Hunt RH. Bezoars. *Gastrointestinal disease: patho-physiology, diagnosis, management*. In: Sleisenger MH, Fordtran JS, eds. Philadelphia: WB Saunders Co. 1993;758-63.