Evaluation of the First Stool Pass Time Induced by Marketed Sorbitol in Benzodiazepine Intoxicated Patients: A Randomized Clinical Trial

Farzad Gheshlaghi[1], Nastaran Eizadi-Mood[2], Faranak Shafiei[2], Gita Montazery[2]*

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ABSTRACT

Background: Poisoning, a common worldwide problem, seeks its own treatments to improve, especially by the forthcoming evidence based medicine (EBM). Charcoal/sorbitol slurry (CSS) administration is one of these methods with great debates around it which needs to be investigated more.

Methods: In this clinical trial, 105 cases of benzodiazepine toxicity with at least 3 symptoms and no contraindication for sorbitol prescription were divided into 3 groups. Patient grouping was based on the sorbitol manufacturing factory. Sorbitol was prescribed for the patients, with one kind of sorbitol for the patients of each group. The measured variable was the time passed up to the presence of charcoal-mixed stool and the gathered data were analyzed by ANOVA test using SPSS software.

Results: The average age was 25.8±8.4 in females and 24±8.5 years for males (P=0.641). The average follow up time was 8.3±3.1 hours for females and 8.1±2.7 hours for males (P=0.30). The average pass time from drug ingestion, was 46±23.15 min in females and 40±23.15 min in males (P=0.132). Interestingly, no sorbitol was able to increase in transit time in the study population despite a follow-up interval about 3 times more than expected (based on the reference).

Conclusion: No increase in transit time was seen by sorbitol prescription in our cases despite the appropriate follow-up interval. This ineffectiveness may be somehow due to the absence of standard sorbitol amounts in those products, but we assume that it is mainly due to the population-based bowel habits (i.e. constipated ones with essential prolonged transit time).

Keywords: Bowel Habit, Gastrointestinal Decontamination, Poisoning, Sorbitol.

INTRODUCTION

Based on the existing body of knowledge, the role of gastrointestinal decontamination with either emesis or gastric lavage is fading gradually and as a matter of fact, it is also controversial (1). However, the patients are not, in reality, the same and the questionable role of gastrointestinal decontamination seems through under the holistic view of patients as a group not one (2). The appreciated role of GID in the treatment of potentially life-threatening poisonings is something on behalf of GID (2), but probably no contribution to the outcome, especially in asymptomatic patients (1). The same state exists for AC, but it might be effective in the conflicted toxic patients by delayed absorbing poisons or slowed gastrointestinal motility (3).

Decreasing the amount of absorbed drug by a slurry solution of AC and sorbitol (CSS) is one of these debated GID methods (4). When prompt induction of emesis seems impossible or contraindicated, activated charcoal before or a cathartic are alternatives to get rid of gastric contents (5). Among cathartics, sorbitol is preferred (5). Conventionally, it has been reported that the administration of sorbitol with AC increases poison excretion and decrease the amount of absorbed toxin from GI (6). Therefore, the aim of this study is to evaluate the effects of available sorbitols on the transit time and excretion of poisons from GI.

MATERIALS AND METHODS

This triple-blind randomized clinical trial was conducted on 105 cases with benzodiazepine toxicity, 60 females and 45 males, divided into

1- Department of Clinical Toxicology and Forensic Medicine, School of Medicine, Isfahan University of Medical Sciences, Isfahan, Iran

2- Isfahan Clinical Toxicology Research Center, Isfahan University of Medical Sciences, Isfahan, Iran.

* Corresponding Author: Email: Gheshlaghi@med.mui.ac.ir

3 groups. Since benzodiazepine toxicity is very common, it was chosen for this study. The patients referred to the Poisoning Center (Noor University Hospital, Isfahan, Iran) with different amounts and different manifestations of benzodiazepine toxicity. Inclusion criteria were presence of at least 3 symptoms of benzodiazepine toxicity, and exclusion criteria were sorbitol contraindications, such as ingestion of corrosive agents, severe diarrhea, adynamic illeus, recent bowel surgery, and bowel obstruction (7). Non-random convenience was used for sampling. Gastrointestinal decontamination was not contraindicated in any of the patients. The patients received 50 grams of activated charcoal in 100cc of tap water in combination with sorbitol (1 gram/kg) plus 50 cc of tap water. Allocating patients into 3 categories was also based on the kind of sorbitol used:

Osve Factory product
A) Poorsina Factory product
B) Tehran Pharma Factory product.

Group A included 23 females and 12 males, group B included 17 females and 18 males, and group C included 20 females and 15 males.

Regarding the kind of sorbitol used, all patients were followed up to the presence of charcoal-mixed stool or discharge time. The lasting time was measured correctly and all registries were analyzed by ANOVA test using SPSS software.

RESULTS

The mean of age was 25.8±8.4 in females and 24±8.5 years for males (P=0.641). The average follow-up time was 8.3± 3.1 hours for females and 8.1±2.7 hours for males (P=0.30). The average pass time from drug ingestion, was 46±23.15 minutes in females and 40±23.15 minutes in males (P=0.132). Interestingly, no type of sorbitol caused diarrhea in the study population despite a follow-up interval up to about 3 times more than expected (based on the reference). Noticeably, the average follow-up interval in our study was more than the maximum reported time for diarrhea presence after sorbitol prescription, which is 2.6 hours.

DISCUSSION

Since most poisoned cases are asymptomatic, no major therapeutic intervention is needed in the majority of cases (8), but if needed, mostly GID with activated charcoal are used to prevent further absorption of the toxin (5). The maximum effect of GID (GE and GL) is by its use within one hour of drug ingestion (6). The superiority of GL over the Ipecac syrup is conspicuous while AC is also superior to the available gastric emptying procedures. Cathartics (preferentially sorbitol) can be used in association with activated charcoal, and it is considered as an alternative to the removal of gastric contents. Sorbitol, as a cathartic, may reduce the transit time of toxin and reduce the constipating effects of multiple doses of AC (7). Although there are some controversies about the role of CSS in the management of toxicity, it is routinely used in most poisoning centers. Sorbitol, as cathartics, will increase the bowel movements and decrease the interval for the first charcoal stool. Harchelroad et al. demonstrated that 50.7% of the poisoned cases took less than 6 hours for the first charcoal stool (4). Interestingly, our results demonstrated no reduction in the pass time for the first charcoal stool, despite the 3 times more observation period than the standard reported time. In this study, we examined 3 different marketed sorbitol compounds, which are not exactly the same juristically and some differences from standard sorbitol may also be present which should be checked. In fact, it may be one of the listed causes of getting no increased bowel transit time from sorbitol. However, the major one may be the constipated bowel habit of the population under study. Therefore, a revision for using some conventional GID methods should be made, especially in considering sorbitol side effects.

CONCLUSION

No diarrhea induction was seen by sorbitol prescription in our cases, despite the appropriate follow-up interval. This ineffectiveness might be somehow due to the absence of standard sorbitol amounts in those products and slight anti-cholinergic activity of benzodiazepines, but we think that this is mainly due to the population-based bowel

habits (i.e. constipated ones with essential prolonged transit time).

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