

Pharmacologically Relevant Drug Interactions of Pramlintide (Amylin Analogue)

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ABSTRACT

Pramlintide is an Amylin analogue useful in the treatment of type 1 and type 2 diabetes mellitus. Pramlintide may delay the absorption of certain medications such as Acetaminophen (Paracetamol), by slowing down the gastric emptying. The absorption of Oral contraceptives and Antibiotics might also be delayed by the concurrent use of Pramlintide. Such interaction could be prevented by using them 1 hour before or 2 hours after Pramlintide administration.

Keywords: Drug Interactions; Amylin Analogue; Pramlintide; Type 1 Diabetes; Type 2 Diabetes.

Introduction

Pramlintide is an Amylin analogue and it helps to manage the blood glucose of patients with type 1 and type 2 diabetes mellitus [1]. The postprandial glucose concentrations are reduced by the administration of Pramlintide through at least three mechanisms including reduction of postprandial glucagon secretion, slowing of gastric emptying and suppression of appetite by a central mechanism. The reduction of postprandial glucagon secretion results in decreased glucose production from liver and the food intake is decreased by slowing of gastric emptying and the suppression of appetite [2]. Diabetes is one of the leading causes of cardiovascular diseases, blindness, kidney failure, amputations, and others. According to International Diabetes Federation (IDF), globally 451 million were affected by Diabetes, in 2017 and it has been projected that the global population with diabetes would reach around 693 million by 2045. It has also been estimated that approximately 5 million global deaths and 850 billion US dollars of healthcare costs were attributed to diabetes in the year of 2017 [3].

Polypharmacy is very common among the patients with diabetes and the incidence of drug interaction is higher in patients with diabetes as they may take several medications to treat comorbid conditions such as cardiovascular diseases, hepatic diseases, renal problems, depression, and others along with the medications controlling blood glucose [4]. Interference of effects of one drug by other drug(s), supplements, food, smoking or alcohol

consumption, is known as Drug interaction [5]. In addition, the drug interaction resulting in elevated risk of adverse effects or decreased therapeutic efficacy is termed Adverse Drug Interaction [6,7]. Pramlintide may slow down the absorption of certain orally administered drugs as it delays the gastric emptying.

Acetaminophen (Paracetamol)

Acetaminophen is an antipyretic drug and millions daily, worldwide, use it. It is frequently employed as a marker of gastric emptying due to its high permeability and high solubility [8]. Concomitant use of Pramlintide and Acetaminophen resulted in slowed absorption of acetaminophen. However, this interaction is clinically insignificant [9]. The patients may take Acetaminophen or other analgesics 1 hour before or 2 hours after Pramlintide administration for better analgesia.

Oral Contraceptives

Rapid absorption of oral contraceptives is essential to prevent the unwanted pregnancy and Pramlintide may slow down the absorption of oral contraceptives due to delayed gastric emptying [10]. The patients on Pramlintide may take Oral contraceptives 1 hour before or 2 hours after the administration of Pramlintide [11].

Antibiotics

The gastric uptake of Antibiotics might be interfered by the concomitant administration of Pramlintide which may affect

therapeutic efficacy of Antibiotics [10]. If concurrent use of Pramlintide and Antibiotics is necessary, Antibiotics might be administered 1 hour before or 2 hours after the administration of Pramlintide.

α -glucosidase Inhibitors

The α -Glucosidase inhibitors are oral antidiabetic medications used to treat patients with type 2 diabetes and they include Acarbose, Miglitol and Voglibose. They slow down the intestinal absorption of nutrients by increasing the gastrointestinal motility and the coadministration of Pramlintide with α -Glucosidase inhibitors may interfere further with their absorption [12].

Insulins

Mixing of Pramlintide with Insulins in a single syringe may affect the compatibility of either drugs due to pH differences. The manufacturer advises to avoid mixing of Pramlintide and Insulins in the same syringe to prevent this pharmaceutical interaction [13].

Conclusion

No clinically significant drug interactions have been reported with the use of Pramlintide, though there are few possible interactions related to delayed absorption of oral medications. Pramlintide slowed down the absorption of Acetaminophen (Paracetamol) by delaying the gastric emptying and it may also delay the absorption of Oral contraceptives and Antibiotics through similar mechanism. The intestinal absorption of nutrients might be interfered by the concomitant use of Pramlintide and α -Glucosidase inhibitors such as Acarbose, Miglitol and Voglibose. The compatibility of Insulin or Pramlintide could be affected by mixing them in a same syringe. Future studies are needed to confirm the interaction of Pramlintide with Anticholinergics and the drugs having anticholinergic potential such as Antihistamines, Antidepressants and others.

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