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Opinion Article

The use of orlistat in diabetes: An educational article and expert opinion

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Abstract

In 1998, Hermann Toplak and Marhardt reported the emergence and registration of orlistat in Austria. Orlistat is an intestinal lipase inhibitor which decreases intestinal triglycerides absorption and help in lowering the ultimate calorie intake. The aim of this paper is to provide an overview of orlistat research progress in diabetes.

Conclusion: There has been accumulating convincing evidence suggesting that the use of orlistat in type 2 diabetes can have beneficial effects on diabetic control, body weight, glycosylated hemoglobin, and insulin resistance.

Keywords: type 2 diabetes; orlistat; research progress; expert opinion

Introduction

In 1998, Hermann Toplak (Figure-1) and Marhardt reported the emergence and registration of orlistat in Austria. Orlistat is an intestinal lipase inhibitor which decreases intestinal triglycerides absorption and help in lowering the ultimate calorie intake. They reported the results of preliminary studies which suggested that orlistat is a safe medication that can have a role in weight reduction and improving metabolic parameters [1].

Figure-1: Hermann Toplak.

Also in 1998, Priscilla Hollander (Figure-2) from the United States and her research group reported a multicenter 57-week placebo-controlled study which included 391 obese adult patients with diabetes type 2 who were being treated with oral sulfonylureas. Patients received oral orlistat 120 mg or placebo three times daily with a mildly low-calorie diet.

Figure-2: Priscilla Hollander.

After 1 year, when compared with placebo group, orlistat treatment was associated with significant reduction in weight ($P < 0.001$), marked improvement in glycemic control occurring in association with decreased HbA1c ($P < 0.001$) and lowering of fasting plasma glucose ($P < 0.001$). Therefore, orlistat treatment was also associated with and reductions of the dose of oral sulfonylurea medication ($P < 0.01$).

49 patients treated with orlistat lost 5% or more of them of initial body weight, while only 23% of patients in the placebo group experienced such loss ($P < 0.001$). When compared to placebo, orlistat treatment was also associated with marked improvements in total cholesterol, ($P < 0.001$), LDL cholesterol ($P < 0.001$), and triglycerides ($P < 0.05$).

Side effects associated with orlistat included mild to moderate and transient gastrointestinal events and few patients required fat-soluble vitamin supplementation [2].

In 2002, Gokcel et al from Turkey reported a study which showed that orlistat can be used safely to reduce cardiovascular risk and can reduce the risk of developing diabetes mellitus type 2 in obese females [3].

In 2003, David E Kelley from the United States and his research group reported a one-year, placebo-controlled study which included overweight or obese adult patients with diabetes mellitus type 2 who had suboptimal metabolic control despite treatment with insulin alone or combined with oral medications.

Patients received either orlistat (120 mg three times daily) or placebo combined with a reduced-calorie intake. Orlistat was associated with considerably more weight loss than the placebo. Orlistat was also associated with higher reductions in glycosylated hemoglobin HbA1c ($P=0.002$), fasting serum glucose ($P = 0.02$), and reduced the required doses of insulin and other medications.

Orlistat also associated with more improvements than placebo in serum total cholesterol ($P = 0.0002$) and LDL cholesterol concentrations ($P = 0.001$) and LDL/HDL ratio ($P = 0.01$).

Therefore, David E Kelley and his research group suggested that the use of orlistat can be associated with important weight loss, and with improvements in glycemic control, and can also help in reducing cardiovascular disease risk factors, in overweight or obese patients with diabetes mellitus type 2 having unsatisfactory metabolic control with insulin therapy [4].

In 2005, Ruof et al reported a meta-analysis which included 1249 patients with diabetes type 2 associated with obesity or overweigh treated with orlistat and 1230 who received placebo.23% of the patients treated with orlistat experienced a weight reduction of >/=5%. Weight reduction was associated with a mean reduction in glycosylated hemoglobin (HbA1C) of 1.16%, a decrease in total cholesterol of 5.3% and a lowering of systolic blood pressure of 5.2 mmHg [5].

In 2009, Jacob et al from Germany reported a meta-analysis of seven multicentre placebo-controlled studies which included 2550 patients with diabetes type 2 (Age: 18-70 years) who were overweight or obese. 1279 patients received orlistat 120 mg three times daily, and 1271 patients received placebo for six months or one year. Compared to placebo, orlistat therapy was associated with considerably more reductions in fasting plasma glucose, and glycosylated hemoglobin (HbA1c). The improvement of diabetic control with orlistat treatment occurred independently of weight loss, and that was attributed to increasing insulin sensitivity, slowing fat digestion, and stimulating secretion of intestinal glucagon-like peptide-1 [6].

In 2012, Derosa et al from Italy reported a placebo-controlled study which included 254 diabetic patients with obesity treated with either orlistat 360 mg daily or placebo for one year. Orlistat treatment was associated with a considerable decrease in body weight, improved lipid profile and glycosylated hemoglobin HbA1c. In addition, orlistat had beneficial effects on inflammation markers and insulin resistance. The use of orlistat was not associated with any serious adverse effect [7].

Conclusion

There has been accumulating convincing evidence suggesting that the use of orlistat in type 2 diabetes can have beneficial effects on diabetic control, body weight, glycosylated hemoglobin, and insulin resistance.

Conflict of interest: None.

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