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Once-weekly semaglutide delays a late phase gastric emptying of solid meal measured by repeated scintigraphic imaging in obese women with PCOS

Mojca Jensterle, MD, PhD, Simona Ferjan, MD, PhD,

Luka Lezaic, MD, PhD, Aljaz Socan, MD, PhD,

Katja Zaletel, MD, PhD, and Prof Andrej Janez, MD, PhD

Background: GLP-1 agonism have the potential to affect gastric emptying (GE), yet the reports for subcutaneous

semaglutide, currently the most effective GLP-1 RA approved for weight management, remain inconclusive. It has been demonstrated that once-weekly semaglutide either had no effect on GE or it delayed GE only within the first hour, without late phase retention. Notably, those conclusions were made by an indirect method of estimation of GE through ingestion, absorption and determination of plasma level of paracetamol. Furthermore, in most previous studies with once weekly semaglutide, GE has been evaluated as a part of the composite outcome. The indirect method with paracetamol was shown to be appropriate for evaluation of kinetics of liquid meals, whereas it might lead to inaccurate estimation of late phase GE. Scintigraphic evaluation is considered as a reference method for the purpose.

Aim: This is the first study that evaluates the effect of once weekly subcutaneous semaglutide on late phase GE of a solid meal by scintigraphy in obese women with PCOS without other comorbidities as a primary outcome.

Materials and Methods: A single-blind, placebo-controlled trial was conducted in 20 women with PCOS and obesity, without diabetes and other comorbidities, randomized to once weekly subcutaneous semaglutide 1.0 mg (S) or placebo (P) for 8 weeks. Gastric emptying was assessed by scintigraphy after ingestion of 99mTC colloid in pancake labelled with radiopharmaceutical that maintained a stable binding within gastric environment by scintigraphy using sequential static imaging and dynamic acquisition. Estimation of GE was obtained by repeated imaging of remaining 99mTC activity (RA) at fixed time intervals over 4 hours and the half time (T1/2) of gastric emptying had been calculated. Additionally, we evaluated anthropometric, metabolic, hormonal and appetite parameters.

Results: At 30 min after ingestion significant difference in RA was observed between semaglutide group and placebo (92.5% in S vs. 89% in P ($p=0.05$)) and persisted throughout the observation period up to 4 hour (37% in S vs. 0% in P ($p=0.002$)). T1/2 was significantly longer in S as compared to P (171 min vs 118 min, respectively ($p<0.001$)). In addition, semaglutide led to significant decrease in weight, waist and neck circumference, HbA1c and androgen levels. Subjective ratings of appetite suppression correlated with T1/2.

Conclusion: Once weekly semaglutide 1.0 mg resulted in a significant late-phase retention of solid meal measured by repeated scintigraphic imaging. This effect correlated with appetite suppression and likely contributed to weight loss.

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