## Simultaneous Use of Two External Subcutaneous Pumps Delivering Insulin and SYMLIN: Use of a Double-Pump System

Alan B. Schorr, D.O.,<sup>1</sup> and Regina Ofan, R.N., B.S.N., C.D.E.<sup>2</sup>

L he combination of insulin and an amylin mimetic is an option for diabetes treatment.<sup>1,2</sup> The effectiveness of this modality has been established, but there is a limited amount of literature regarding the use of this combined treatment via continuous subcutaneous infusion by external pumps. A short 16-week trial of 10 patients studied the pharmacokinetics of pramlintide (SYMLIN<sup>®</sup>, Amylin Pharmaceuticals, LLC, San Diego, CA) in continuous subcutaneous infusion and found this modality to be safe and well tolerated.<sup>3</sup>

Treatment was initiated in a small study of 10 subjects (7 females and 3 males) with age range 24–69 years. There were 5 patients with type 1 diabetes and 5 with type 2 diabetes (duration of diabetes: 15–38 years). Patients were switched from conventional multiple-dose insulin injection therapy or oral hypoglycemic agents to the combination of insulin and SYMLIN via continuous subcutaneous infusion using two external pumps simultaneously. Treatment was continued over a period of 1–5 years. Hemoglobin A1c (HbA1c), total daily insulin, total daily SYMLIN, weight, and blood glucose levels were measured, with follow-up ranging from 1–5 years.

Patients using the double-pump system showed an average reduction in HbA1c from 8.3% to 6.9%. Total daily insulin was reduced from an average of 147 to 96 units per day. SYMLIN dosages increased from an average of 35 units per day to 50 units per day (**Figure 1**). Weight reduction was noted, with an initial average of 132 to 500 lb, decreasing to 110 to 360 lb.

All patients completed a satisfaction survey and expressed satisfaction with the treatment regimen but indicated their preference for a dual or multichamber device. They also noted that they would not return to conventional SYMLIN injections if given the choice.

We conclude that continuous infusion of insulin and SYMLIN via a pump system is a viable and effective therapeutic option. In this small observational study, all patients showed improvement in metabolic and weight control over a period of 1–5 years. Further studies with a larger population and a control group are needed to empower these results.

Author Affiliations: <sup>1</sup>Division of Endocrinology, Saint Mary Medical Center, Langhorne, Pennsylvania, and <sup>2</sup>Clinical Affairs, Spring Health Solutions, Ltd., Tirat-Carmel, Israel

Abbreviations: (HbA1c), hemoglobin A1c

Keywords: double pump, insulin pump, multiple-dose injections, SYMLIN

Corresponding Author: Alan B. Schorr, D.O., 380 Middletown Boulevard, Suite 710, Langhorne, PA 19047; email address contact@sugardoc.com



**Figure 1.** Insulin dosage vs SYMLIN dosage over duration of study. Amylin conversion of units to micrograms: 1 unit = 6  $\mu$ g. Patients were treated with basal SYMLIN 0.5–2.5 unit/h (3–15  $\mu$ g). Meal bolus was 2.5–10 units (15–60  $\mu$ g).

## Acknowledgements:

The authors acknowledge Spring,™ Tirat-Carmel, Israel (<u>http://www.springnow.com/</u>) for assistance in manuscript preparation.

## **Disclosures**:

The authors are members of Speakers Bureau for SYMLIN.

## **References:**

- 1. King AB. Minimal reduction in insulin dosage with pramlintide when pretreatment near-normal glycemia is established and square-wave meal bolus is used. Endocr Pract. 2009;15(3):229–33.
- Marrero DG, Crean J, Zhang B, Kellmeyer T, Gloster M, Herrmann K, Rubin R, Fineberg N, Kolterman O. Effect of adjunctive pramlintide treatment on treatment satisfaction in patients with type 1 diabetes. Diabetes Care. 2007;30(2):210–6.
- 3. Huffman D, McLean G, Seagrove M. Continuous subcutaneous pramlintide infusion therapy in patients with type 1 diabetes: observations from a pilot study. Endocr Pract. 2009;15(7):689–96.