"A novel, self-administration drug delivery system for subcutaneous infusion was developed and evaluated. The device includes two main components: an osmotic tablet controlled gas actuator and a syringe catheter system. " Xie et al (2014).

Reference:

Xie, X., Yang, Y., Yang, Y., Li, Z., Zhang, H., Chi, Q., Cai, X. and Mei, X. (2014) The development and evaluation of a subcutaneous infusion delivery system based on osmotic pump control and gas drive. Drug Delivery. September 4th. .

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Abstract:

A novel, self-administration drug delivery system for subcutaneous infusion was developed and evaluated. The device includes two main components: an osmotic tablet controlled gas actuator and a syringe catheter system. The sodium carbonate in the osmotic pump tablet will release into the surround citric acid solution and produce CO2 gas, which will drive the drug solution into subcutaneous tissue. The key formulation factors of the osmotic tablet that would influence the infusion profiles of the device were investigated by single factor exploration. The formulation was optimized via a response surface methodology. With an

18 ± 4 min of lag time, the delivery system was able to infuse at an approximate zero-order up to 5.90 ± 0.37 h with a precision of 9.0% RSD (n = 6). A linear correlation was found for the infusion profile and the fitting equation was Y = 0.014X - 0.004 (r = 0.998). A temperature change of 4 °C was found to modify the flow rate by about 12.0%. In vivo results demonstrated that the present subcutaneous infusion device was similar to the commercial infusion pump, and it could bring a long and constant ampicillin plasma level with minimized fluctuations.

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