



There are limited data on the use of elastomeric infusion pumps during hyperbaric oxygen treatment” Perks et al (2017).

Abstract:

INTRODUCTION: There are limited data on the use of elastomeric infusion pumps during hyperbaric oxygen treatment.

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AIM: This study evaluated the flow rate of the Baxter elastomeric LV10 Infusor™ pump under normobaric (101.3 kPa) and three hyperbaric conditions of 203 kPa, 243 kPa and 284 kPa.

METHODS: Elastomeric pumps were secured to participants in the same manner as for a typical patient, except that a container collected the delivered antibiotic solution. Pumps and tubing were weighed before and after the test period to determine volume delivered and to calculate flow rates at sea level and the three commonly used hyperbaric treatment pressures at two different time periods, 0-2 hours (h) and 19-21 h into the infusion.

RESULTS: The mean flow rates in ml·h⁻¹ (SD) were: 9.5 (0.4), 10.3 (0.6), 10.4 (0.6), 10.4 (0.5) at 0-2 h and 10.5 (1.0), 12.2 (0.6), 9.4 (0.5), 10.3 (0.9) at 19-21 h for the normobaric, 203 kPa, 243 kPa and 284 kPa conditions respectively. There was no significant association

between flow rate and time period ($P = 0.166$) but the 203 kPa flow rates were significantly faster than the other flow rates ($P = 0.008$). In retrospect, the 203 kPa experiments had all been conducted with the same antibiotic solution (ceftazidime 6 g). Repeating that experimental arm using flucloxacillin 8 g produced flow rates of $10.4 (0.8) \text{ ml}\cdot\text{h}^{-1}$, with no significant associations between flow rate and time period ($P = 0.652$) or pressure ($P = 0.705$).

CONCLUSION: In this study, the flow rate of the Baxter LV10 Infusor™ device was not significantly affected by increases in ambient pressure across the pressure range of 101.3 kPa to 284 kPa, and flow rates were generally within a clinically acceptable range of $9\text{-}12 \text{ ml}\cdot\text{h}^{-1}$. However, there was evidence that the specific antibiotic solution might affect flow rates and this requires further study.

Reference:

Perks, S., Blake, D.F., Young, D.A., Hardman, J., Brown, L.H., Lewis, I. and Pain, T. (2017) An assessment of the performance of the Baxter elastomeric (LV10) Infusor™ pump under hyperbaric conditions. *Diving and Hyperbaric Medicine*. 47(1), p.33-37.

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