Infusion sets with precision flow regulators are frequently used in children undergoing surgery in order to control the perioperative administration of fluids" Bollinger et al (2019).

Abstract:

BACKGROUND: Infusion sets with precision flow regulators are frequently used in children undergoing surgery in order to control the perioperative administration of fluids. There are no data about the safety and accuracy of these infusion sets. A study was therefore conducted to compare adjusted and actual flow rates of three different infusion sets with precision flow regulators under standardized conditions.

METHODS: The study evaluated three different infusion sets with precision flow regulators each at two different static levels. The actual flow rates of 5 infusions were recorded each time for adjusted flow rates of 50 ml/h, 100 ml/h, 150 ml/h, 200 ml/h and 250 ml/h over 1 h. Statistical analysis was performed with Excel (Excel, Microsoft Corporation, Redmond, WA, USA) and SOFA (Paton-Simpson and Associates Ltd., USA). The results are presented as means (standard deviation).

RESULTS: For the adjusted flow rates of 50, 100, 150, 200 and 250 ml/h, actual flow rates were 107 (5.3), 174.8 (6.5), 255.8 (10.2), 312.4 (15.7) and 362.6 (20.2) ml/h for the Frekadrop® infusion set at a static level of 128 cm and 83.8 (4.4), 147.8 (5.5), 197 (12.4), 257.2 (4.97) and 311.6 (17.9) ml/h at a static level of 100 cm, respectively. For the Exadrop®

infusion set actual flow rates were 88.6 (6.9), 131.2 (14.1), 224.4 (14.1), 296.6 (27.6) and 330.4 (22.4) ml/h at a static level of 128 cm and 54 (4), 82.4 (10.2), 138.8 (15.7), 209.4 (36.8) and 249 (12) ml/h at a static level of 76 cm, respectively. For the D-Flo infusion set actual flow rates were 95.6 (2.8), 167.6 (29), 217.8 (9.9), 281.6 (10.6) and 396.8 (37.5) ml/h at a static level of 128 cm and 69.2 (4.4), 110.2 (12.6), 169.2 (6), 205.2 (14) and 243 (15.9) ml/h at a static level of 80 cm, respectively.

CONCLUSION: The actual flow rates differed considerably from the adjusted flow rates in the evaluated infusion sets. The flow rates substantially depended on the static level of the infusion. First and foremost, regulation of the administered infusion volume does not seem to be reliable when using an infusion set with a precision flow regulator.

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Reference:
Bollinger, M., Keller, C., Theis, C. and Russo, S.G. (2019) Perioperative infusion therapy in children : Are infusion sets with precision flow regulators suitable for pediatric anesthesia? Der Anaesthesist. doi: 10.1007/s00101-019-0609-8. . .