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Abstract 191

Cylinder pump is more effective in administration of pediatric dose dopamine compared to syringe pump

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Background and Aims: Drug delivery inaccuracy problem of infusion pump frequently occurs at lower flow rate, especially with peristaltic pump. Thus, syringe pump is preferred to the peristaltic pump when administering intravenous drug with low flow rate. However, when using a syringe pump the premixed drug in the fluid bag must be transferred to the syringe. This process not only increases the work loading of the nursing staff, but also increases the risk of infection or missed-dosed syringe problem. Recently, a cylinder-type intravenous infusion pump (cylinder pump) has been introduced in clinical use. Because the cylinder pump can be versatilely connected with both fluid bag and syringe, it can avoid the problems associated with the process of drug transferring from the bag to syringe. As yet, the performance of cylinder pump on pediatric dose of vasoactive drug delivery has not been studied. Thus, we investigated the performance of cylinder pump in pediatric dose of dopamine delivery by comparing to conventional syringe pump.

Methods: To simulate delivery of the dopamine to a pediatric patient of 10 Kg body weight, flow rate of 7.5 ml/hr was tested with syringe pump (PefusorSpaceTM, Bbrn) and cylinder pump (Anyfusion V-100TM, Meinntech). Test was performed with commercially available dopamine premix (800 mcg/ml) prepared in 50 ml syringe and the premix-bag for syringe pump, and cylinder pump, respectively. The actual volume of delivered fluid (by min) and start-up delay (by sec) were recorded. The time to deliver the 7.5 ml (completion time, CT) and the actual delivered volume at one hour (1 hr-delivered volume, Vol1h) were also recorded. Mann-Whitney test was used.

Results: Cylinder pump showed shorter start up delay in comparison to syringe pump (9.6 ± 7.0 s vs. 60.4 ± 50.8 s, $p < 0.01$). Cylinder pump showed exact CT (60 min) in 5/7 (71%) experiments, but syringe pump CT < 60 min in all experiments (CT time: 58.9 ± 1.9 min s vs. 55.3 ± 1.4 min. $p < 0.01$). Vol1h was 7.6 ± 0.0 ml in cylinder pump and 8.2 ± 0.2 ml in syringe pump ($p < 0.01$).

Conclusions: The cylinder pump shows accurate drug delivery for pediatric dose of dopamine which was prepared in a fluid bag. In addition, it showed more precise delivery dynamic when compares to the syringe pump. Cylinder pump can be an effective alternative to the syringe pump for pediatric dose of dopamine.

Categories

Non-Clinical, Nursing & Allied Health