The purpose of this study is to evaluate infusion pumps, which are claimed to be suitable for blood products and to investigate the impact the pumps had on platelets” Meess (2015).

Abstract:
Platelet concentrates are given to patients suffering with severe thrombocytopenia usually by a gravity transfusion procedure. Increasing patient numbers that are in need of this treatment increase the pressure on hospital staff and space. In order to combat time issues, the use of medical devices such as intravenous infusion pumps are thought to be beneficial for time and simultaneously for safety in transfusion practices.

By using infusion pumps, platelet concentrates can be transfused in less time and provide accurate volume measurements. Manufacturers of infusion pumps claim that these devices are safe to be used for blood products including platelet concentrates. However, published studies were performed on older models and newer devices are on the market now. The purpose of this study is to evaluate infusion pumps, which are claimed to be suitable for blood products and to investigate the impact the pumps had on platelets. Furthermore, the study revealed if the intravenous infusion pumps are safe to be used for platelet transfusion as claimed by manufacturers. A simulated transfusion was performed using the Carefusion Alaris GP Plus volumetric pump and Fresenius Kabi Volumat Agilia infusion pump. Samples were taken from expired platelet concentrates before and after passage through the pump. All samples were investigated for full blood count that included platelet count, mean platelet volume (MPV), platelet distribution width (PDW) and a plateletcrit (PCT). The samples were then centrifuged to achieve platelet-poor plasma and then tested for lactate dehydrogenase (LDH). A power calculation performed on the statistical power analysis program G*power indicated a requirement of 82 samples for a power of 80%. Statistical analysis was performed with the IBM SPSS statistic software. A paired sample t-test was used to calculate mean, standard deviation and P values for the infusion pumps used. The Wilcoxon Signed Rank Test was used to evaluate results that had a non-normal distribution. No statistically significant changes were found for LDH, PDW and platelet count with the Carefusion infusion pump. PCT and MPV were found to have a statistically significant change with P values of 0.005 and 0.001, respectively, and showed a decrease in their values. The Fresenius Kabi infusion pump has shown no statistically difference in LDH, platelet count, PCT or PDW, with P values of 0.075, 0.425, 0.151 and 0.397, respectively. The MPV showed a statistically significant
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decrease in its value with a $P$ value $< 0.043$. Although only two pumps were tested, the results achieved by testing the devices revealed that there was no influence on the platelet enzyme LDH or the platelet count as the main parameters. However, the findings showed that there was statistically significant differences in MPV of the expired platelet concentrates.

Reference:

Thank you to our partners for supporting IVTEAM