НАПРЯМ 7. МІЖДИСЦИПЛІНАРНІ АСПЕКТИ АНЕСТЕЗІОЛОГІЇ, ІНТЕНСИВНОЇ ТЕРАПІЇ, НЕВІДКЛАДНИХ СТАНІВ СИМУЛЯЦІЙНОЇ ТА ТАКТИЧНОЇ МЕДИЦИНИ

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THE EFFECT OF GENERAL ANESTHESIA ON HEMOSTASIS

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The purpose of this study was to determine the effect of general anesthesia on hemostasis and to identify which method of anesthesia should be preferred by anesthesiologists to ensure maximum patient safety during elective or emergency surgery.

The most commonly used anesthetic agents for induction of anesthesia today are propofol and sufentanil (SFNT). Their effects on hemostasis were therefore evaluated using thromboelastometry (ROTEM) and flow cytometry (FC). Thomboelastometry (ROTEM) is a diagnostic method that evaluates coagulation by assessing the integrations of coagulation factors, inhibitors, anticoagulants and blood cells, particularly platelets, during clot formation and fibrinolysis. ROTEM

employs two primary assays – EXTEM and INTEM – and three supplementary assays – FIB-TEM, AP-TEM and HEP-TEM – for different diagnosis.

Flow cytometry (FC) allows quantitative and qualitative analysis of platelets and other blood particles.

In this study, ROTEM and FC were used to assess coagulation changes induced by anesthetics (propofol and SFNT) in seven ASA I adults. Blood samples were collected before and 5-7 minutes after anesthetic administration, prior to surgical incision, minimizing surgical trauma influence. EXTEM and INTEM analyses included clotting time (CT), clot formation time (CFT), alpha angle and maximum clot firmness (MCF). FC measured total and activated platelet counts.

Statistical analysis was performed using the **Wilcoxon paired nonparametric test.**

The alpha angle in the EXTEM assay increased significantly after administration of propofol and sufentanil, suggesting accelerated clot formation. CFT approached statistical significance, indicating a trend toward hypercoagulability.

INTEM clotting time (CT) also approached statistical significance, consistent with a trend toward hypercoagulability. Other ROTEM parameters, including MFC, did not show significant changes.

FC analysis revealed less than a 5% difference in both total platelet count and activated platelet count after anesthetic administration, indicating no clinically relevant effect on platelet function.

Based on the results of this study, the use of propofol or sufentanil for induction of general anesthesia in ASA I adult patients produced minimal effects on coagulation, with only a slight trend toward hypercoagulability observed in some ROTEM parameters. These results suggest that both agents can be safely used in clinical practice without significant impact on hemostasis.

Paired test.

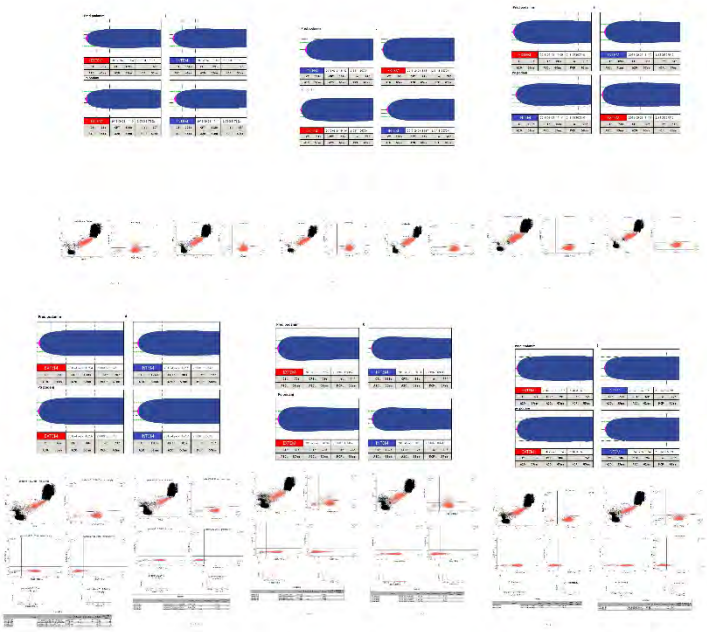
Wilcoxon signed rank test with continuity correction

data: da$pred and da$po

V = 3, p-value = 1

alternative hypothesis: true location shift is not equal to 0

The difference between population medians before and after is not statistically significant; p-value 1.



Summary of results:

- PC all events: population medians not statistically significantly different; p-value = 0.5839
- PC trb: population medians not statistically significantly different; p-value = 1
- PC percent: population means not statistically significantly different; p-value = 0.6996
- PC trba: population medians not statistically significantly different; p-value = 0.5625
- CT Extem: population medians not statistically significantly different; p-value = 1
- CT Intem: population medians not statistically significantly different; p-value = 0.1077. Note: the pvalue borderlines the weak significance; p close to 0.1.
- CFT Extem: population means not statistically significantly different; p-value = 0.06316. Note: the pvalue borers on the significance; p close to 0.05.
- CFT Intem: population means not statistically significantly different; p-value = 0.2424
- alpha Extem: population means ARE statistically significantly different; p-value = 0.04725
- alpha Intem: population means not statistically significantly different; p-value = 0.2017

• MCF Extem: population means not statistically significantly different; p-value = 0.3559
• MCF Intem: population means not statistically significantly different; p-value = 0.1723
• A10 Extem: population means not statistically significantly different; p-value = 0.3078
• A10 Intem: population means not statistically significantly different; p-value = 0.6036
• A20 Extem: population means not statistically significantly different; p-value = 0.2199
• A20 Intem: population medians not statistically significantly different; p-value = 1
• For alpha Extem there is statistically significantly different population mean before and after treatment. We can say even more: the population mean alpha Extem before is statistically significantly lower than after; p-value = 0.04725/2 = 0.023625. The one-sided 95% confidence interval is (-Inf, -0.250507).
• For CFT Extem the population means are weakly significantly different; p-value = 0.06316.
• For CT Intem the difference of population medians before and after is close to weak significance; p-value = 0.1077.

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