

Impact of Heparin Doses on Patient Treatment Outcomes

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Introduction

HD treatment on a routine basis is only feasible if the propensity for blood to coagulate when in contact with a foreign surface is counteracted.

For a proper HD anticoagulation, a very delicate equilibrium is necessary, ideally targeted to prevent both extracorporeal circuit coagulation during treatment and patient bleeding. According to EBPG, the initial loading dose of heparin should be 50IU/kg followed by a maintenance dose of 800-1500IU/h in patients without haemorrhagic complications.

Online (OL) HDF is today considered by many the most advanced treatment modality. However it is demonstrated in several papers that the true benefits derive from a proper convection volume. In post-dilution OL HDF, a very thin balance occurs when maximizing substitution rate and filtration factor vs dialyser status, especially concerning anticoagulation dose.

Objectives

- ▶ Assess the correlation between the prescribed anticoagulation's dose and the classification of the dialyser's aspect, dry weight (DW), substitution volume (SubVol) and spKt/V.
- ▶ Evaluate the correlation between DW and the classification of the dialyser's aspect.
- ▶ Assess whether there are differences between the dialyser's aspect categories and spKt/V and SubVol.

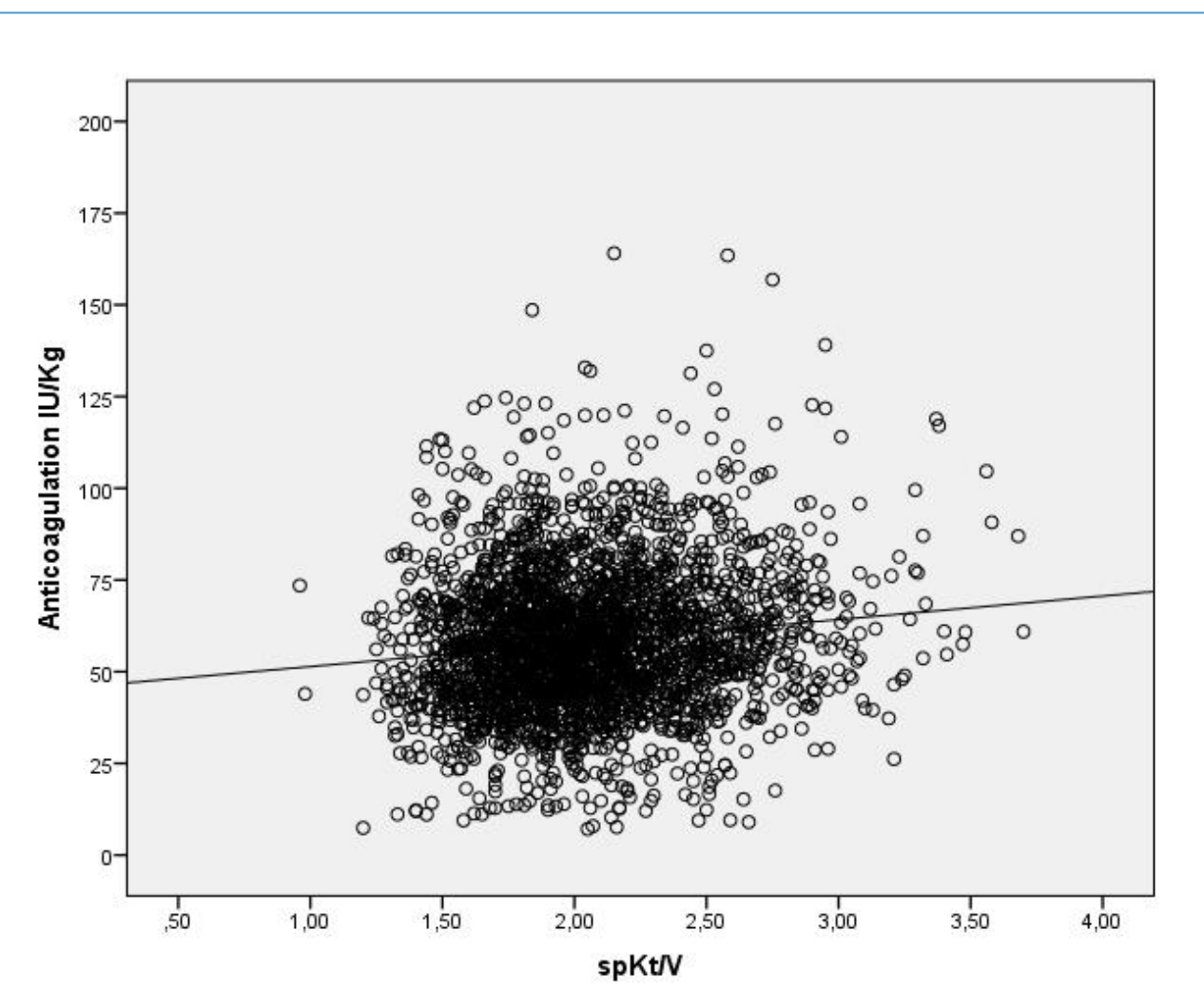
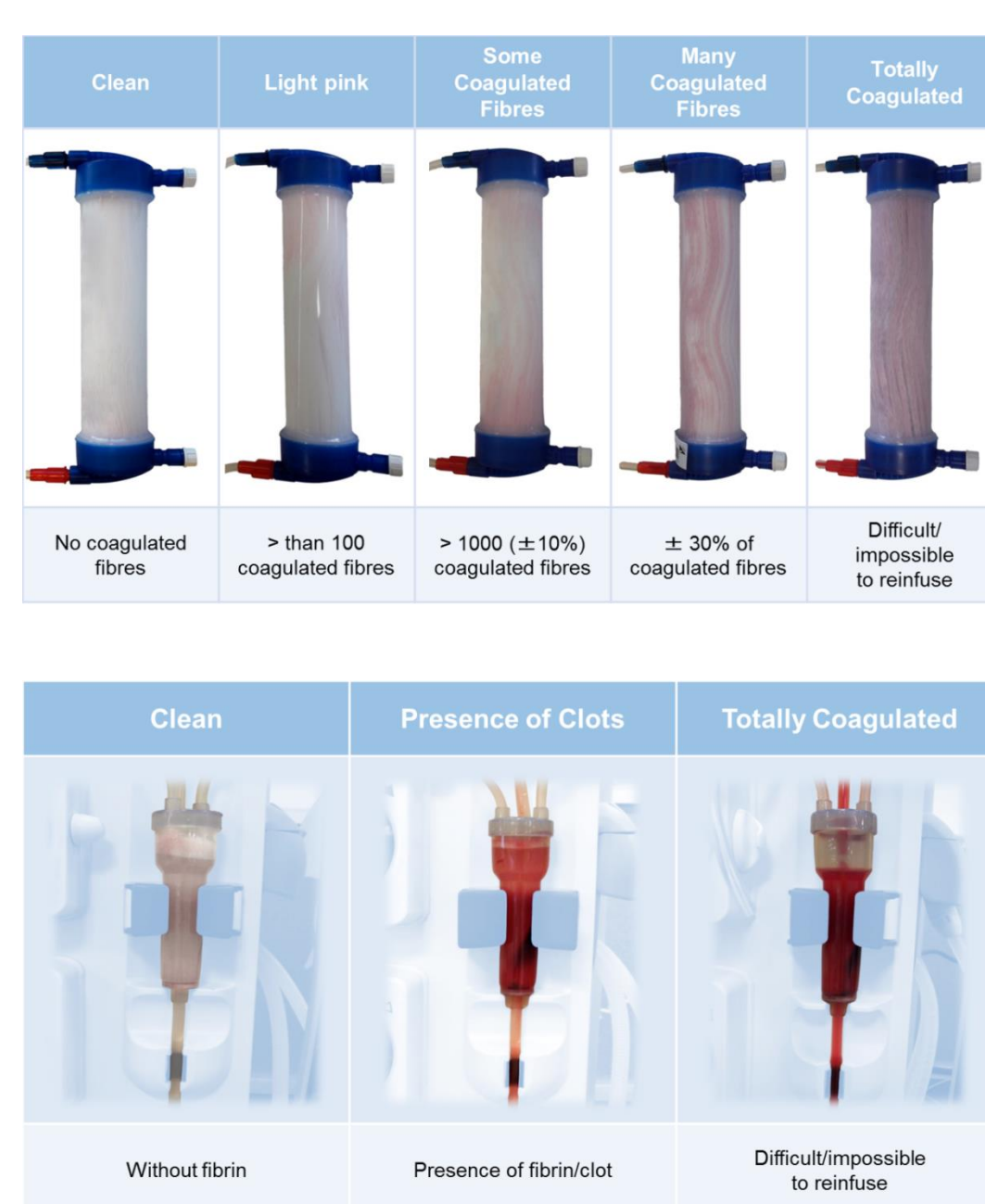
Methods

Multicentre, descriptive-correlational study, involving all patients with internal vascular access under OL HDF during one month (April, 2016).

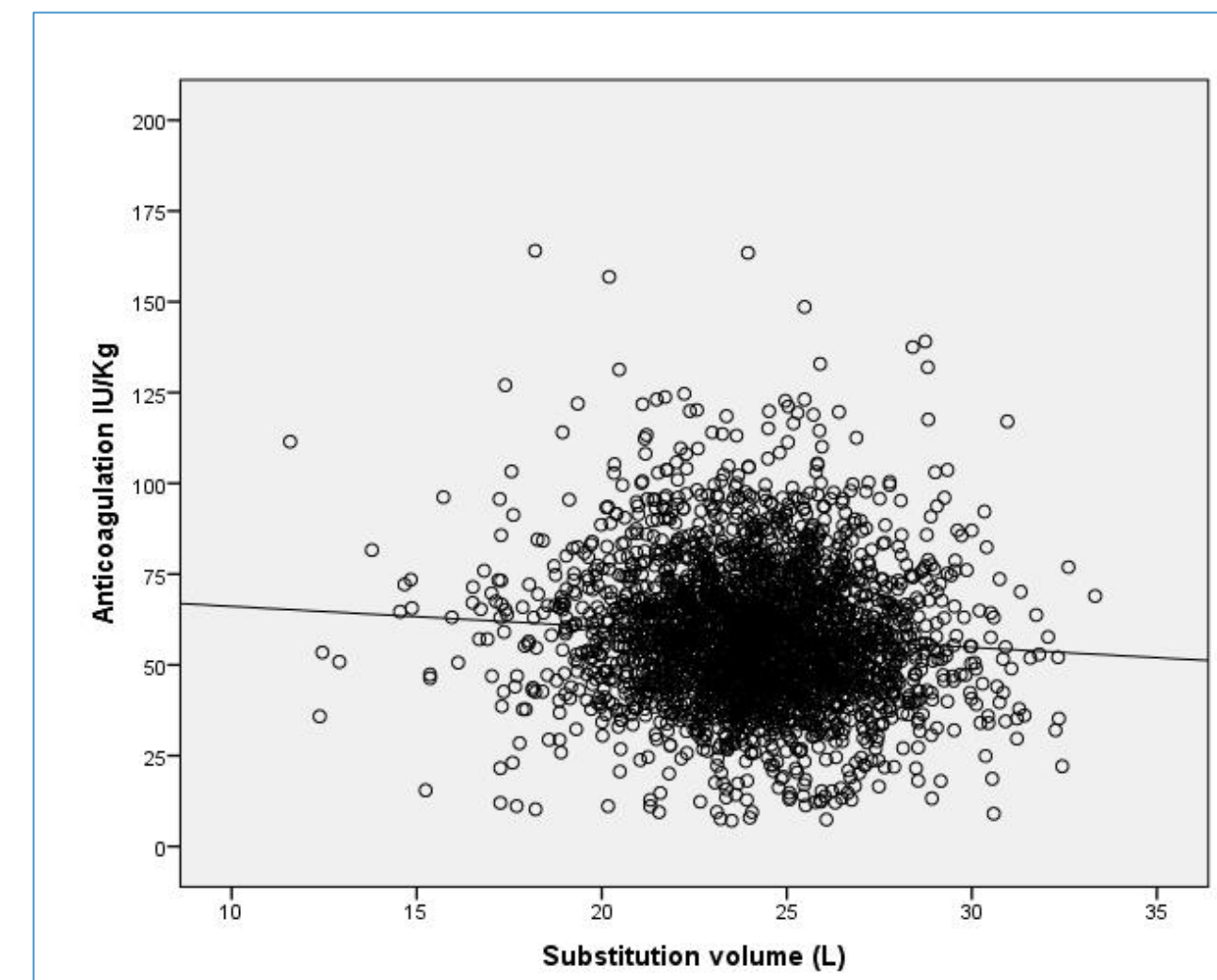
Nursing staff received previous training in order to evaluate and classify the dialyser's appearance.

The dialyser was classified into five categories and the venous drip chamber into three categories.

Report was done immediately after patient disconnection.



Graph 1 – Anticoagulation (IU/Kg) versus spKt/V



Graph 2 – Anticoagulation (IU/Kg) versus Substitution Volume (L)

spKt/V				
	Clean	Light Pink	Up to 10% red fibres	More than 30% red fibres
Clean		0.0784**	0.1344**	0.2341**
Light Pink			0.0560*	0.1557*
*p≤0.05 **p<0.001				

SubVol				
	Clean	Light Pink	Up to 10% red fibres	More than 30% red fibres
Clean		0.433**	0.660**	1.063*
Light Pink			NS	NS
*p≤0.05 **p<0.01				

Table 1 – Multiple comparisons of dialysis aspect classification according to spKt/V and SubVol

Results

2,829 patients were enrolled, mean age was 68.96 SD=13.75 years, 60.8% were men. Average haematocrit was 33.91 SD=3.45%. Average DW was 68.53 SD=13.27kg (10% were above 86Kg).

Mean heparin dose was 58.13IU/Kg. Only 32.4% of patients had a clean dialyser at the end of treatment. 19.4% of patients finished the treatment with more than 10% of clotted fibres. Patients with no residual blood (clean) presented a higher heparin dose (66.32IU/Kg) comparing with overall average dose. The simple linear regression indicated that a 10.9% response's variation in the dialyser aspect can be explained by heparin dose. Patients with DW ≥69Kg presented an inferior heparin dose comparing with overall average dose and as DW increases the possibility of having more clotted dialyser fibres also increases. The relationship between heparin dose and dialyser aspect is weak and negative ($r=-0.330$) but with statistical significance ($p<0.001$)

According Post Hoc tests in ANOVA (Table 1) we identified that there were significant differences in average of spKt/V (Graph 1) and SubVol (Graph 2) between "Clean" and the other dialyser's aspect categories.

Conclusion

Patients with higher DW presented a lower relative heparin dose and had a higher tendency for clotted dialyser fibres. Patients with lower heparin dose presented a higher tendency for clotted dialyser fibres. Dialysers with "Clean" presented an average heparin dose of 66.32IU/kg.

There were significant differences in spKt/V and SubVol between "Clean" group and all the other classification categories. "Clean" group is the most significant to achieve the targets.

References

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