Loss of Catheter Lock Fluid Is Caused by Hydraulic Effects and Not by Diffusion

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Sir,

the recent paper by Zhang et al. [1] about the use of antibiotic catheter locks makes the assumption that filling the catheter with an 'amount of locking solution exactly equally to one lumen of the catheter' avoids spillage of the lock solution into the blood stream. Nevertheless, gentamicin concentrations were elevated prior to next dialysis and this was attributed to the 'diffusion of very small amounts of gentamicin from the locking solution'.

I disagree with both statements. When a matching volume of locking solution is instilled as described approximately 25% is spilled instantly into the blood stream [2]. Subsequently the region between the catheter tip and the most distal side hole is rinsed out which is followed by an exchange of lock solution with plasma or whole blood if the lock density is higher (in case of jugular catheters) compared to plasma or whole blood, respectively [3].

Diffusion is an extremely slow process as shown already by Graham [4]. In the interdialytic interval of 2–3 days diffusion only contributes a negligible amount to spillage [5].

Although the above-cited measurements were done in vitro, the results are applicable in vivo because the processes are based on simple laws of physics. They are also corroborated by clinical observations. Increased aPTT has been reported when samples were taken shortly after locking [6–8].

The low gentamicin concentration measured by Zhang et al. prior to the next treatment does not reflect the gentamicin load immediately after locking. It may be the result of the elimination process in the interdialytic interval.

Spillage of fluid locks cannot be avoided. This must be taken into account when a potential hazardous substance is used for locking.

References

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