

Efficacy of Thrombolysis with Urokinase Containing Locking Solutions for Thrombotic Dysfunction of Tunnelled Hemodialysis Catheters: a Retrospective Single-Centre Cohort Study

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INTRODUCTION

The use of tunnelled cuffed hemodialysis catheters (TCC) is complicated by the development of thrombosis and catheter related bacteremia (CRB). The optimal regimen to treat thrombotic complications with thrombolytic locking solutions remains controversial.

METHODS

Design:

Retrospective single-centre cohort study

Population:

All hemodialysis patients of UZ Brussel > 18 years old, receiving hemodialysis via TCC

Study period:

Between 1st May 2010 and 31st October 2014

Statistical Analysis:

Chi square and Fisher's exact test for binary outcomes, t-test for continuous outcomes using STATA 12.0

Statistical significance <0.05

Thrombotic dysfunction = blood flow < 250 ml/min, arterial pressure < -250 mmHg and/or venous pressure > 250 mmHg

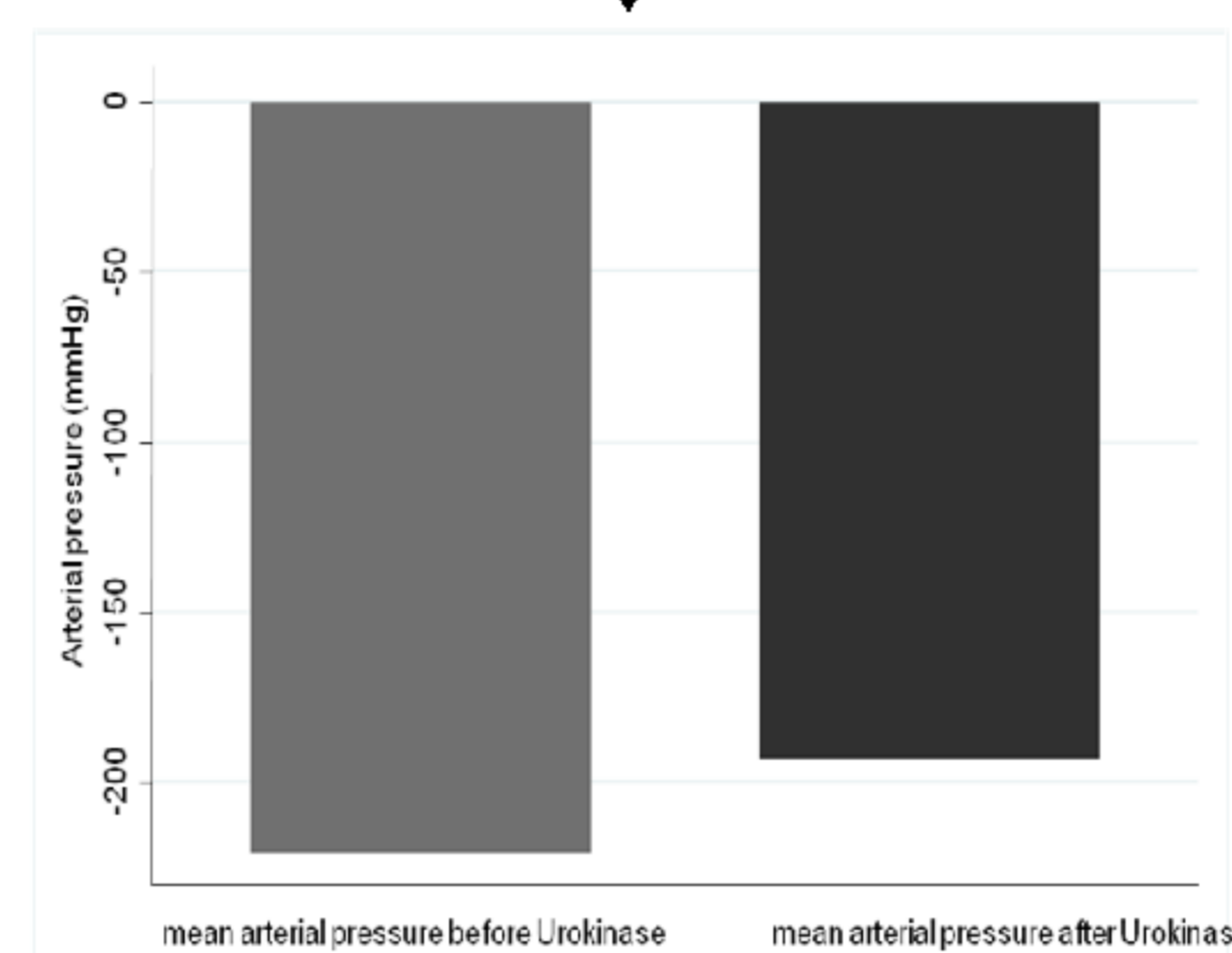
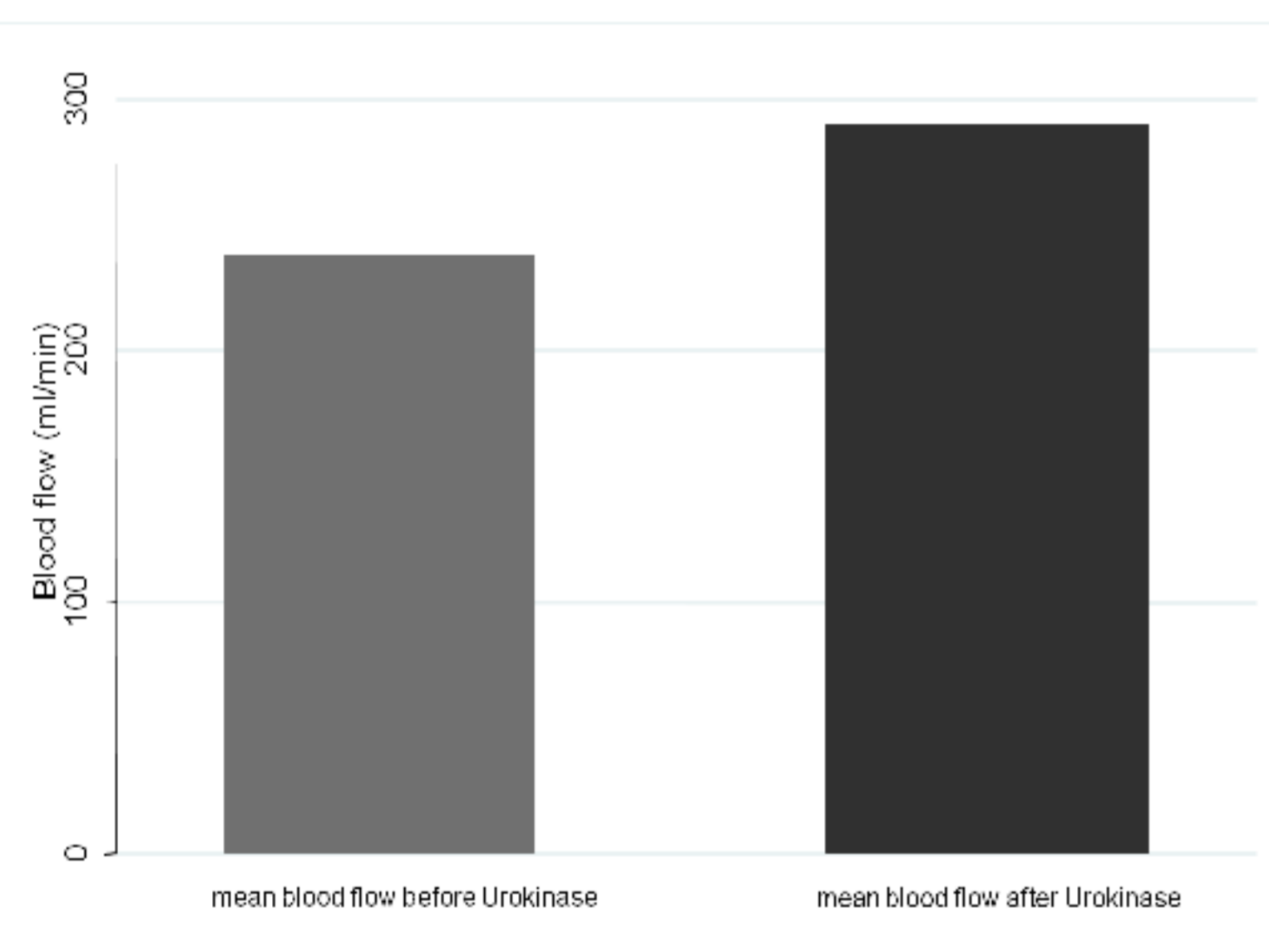
Aim:

- Review of efficacy of different treatment regimens with Urokinase thrombolytic catheter locks to restore adequate access blood flows and pump pressures.
- Advantage of multiple administrations of Urokinase locks between successive dialysis sessions was also investigated.

RESULTS

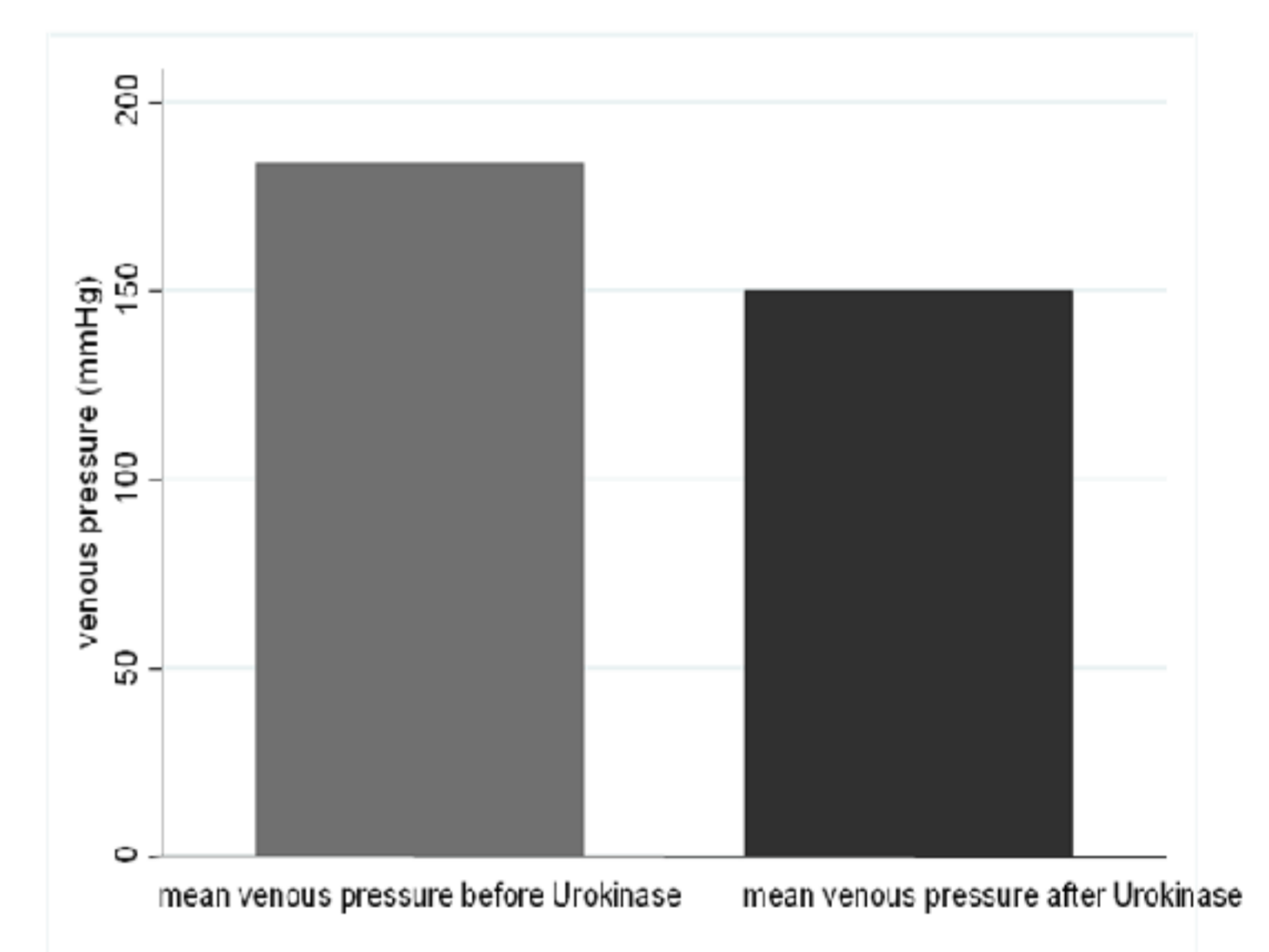
148 patients → 773 thrombotic dysfunctions
Administration of Urokinase 50 000 IU in each catheter lumen

Blood flow
Increase of 54 ml/min
(P<0.0001)
Efficacy: 80% restoring a blood flow > 250 ml/min



Arterial pressure
Increase of 25 mmHg
(P<0.0001)
Efficacy: 90% restoring an arterial pressure > -250 mmHg

Venous pressure
Decrease of 32 mmHg
(P<0.0001)
Efficacy: 90% restoring a venous pressure < 250 mmHg



Multiple administrations of Urokinase locks during successive dialysis sessions for the same thrombotic event

⇒ Mean catheter blood flow was significantly higher after administration of multiple as compared to a single dose of Urokinase (280 ± 71 ml/min vs. 267 ± 75 ml/min; P=0.0153).

⇒ However, this beneficial effect depended on whether the catheter remained dysfunctional after the first treatment. If blood flow did not reach 250 ml/min after the first treatment subsequent Urokinase locks improved blood flow by a further 95 ml/min (P<0.0001) whereas only 8 ml/min were added in case blood flow had recovered normal values after the first dose (P=0.1026).

Incidence rate of catheter-related blood stream infections

The overall incidence rate of catheter-related blood stream infections was low in our cohort (0.23/1000 catheter days) and did not differ significantly in patients with (0.26/1000 catheter days) or without (0.1/1000 catheter days) thrombotic catheter dysfunction (P=0.09).

CONCLUSIONS

- Urokinase was highly effective in reversing thrombotic dysfunction of hemodialysis catheters.
- Multiple administrations were more effective than one single administration only if normal function was not restored after the first treatment.
- The overall incidence of catheter-related bloodstream infections was low and not significantly associated with thrombotic TCC dysfunction.



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