First Experience of Noninvasive Cerebrovascular Autoregulation Monitoring in Hemodialysis Patients

INTRODUCTION AND AIMS: Cerebrovascular autoregulation (CA) might be the reason. The aim of our study was to evaluate the duration of the longest CA impairment during the hemodialysis session by using ultrasonic monitor based on intracranial blood volume fluctuation. Noninvasive CA monitoring of 15 HD patients was performed during the hemodialysis session in December 2016 in the hemodialysis center of the University hospital of Nice. The inclusion criteria were hemodialysis sessions programmed for 4 hours with citrate dialysate and bi-punctured blood circuit. We calculated the percentage of successful 4 hours (±15 minutes) sessions performed with no circuit-clotting or other events leading to premature interruption of the session. The sessions were divided in three groups: group A (no-heparin) is compared to group B (2500 units) or group C (5000 units of dalteparin). Exact fisher test was used to compare categorical variables between two groups and a p-value <0.05 was considered as significant.

RESULTS: During the period, 100 chronic hemodialysis patients (64 men and 36 women), with average dry body weight of 69.5 (±17.3) kg, were sorted. In total, 4924 hemodialysis sessions have been performed of which 1932 (39%) in group A, 2659 (54%) in group B and 333 (7%) in group C. The percentage of successful sessions was similar in three groups: 93.5% in group A, 92.3% (p=0.07) in group B and 95.5% (p=0.22) in group C. The patients taking vitamin K antagonist and Clopidogrel were similar in each group and no differences was found in patients with successful sessions. Only acetylsalicylic acid was significantly (p<0.001) different in group B in favor of successful sessions. The average flow rates were similar 357, 357 and 372 ml/min in each group with 19%, 26% and 17% of missing data respectively due to the dysfunction of computer recording box. No differences were found in favor of success rate. But we need to stratify the blood flow rate and analyze further to have more informations. The sessions were performed with 8 different types of dialyzers including low, middle and high permeability membranes. In an univariate analysis on dialyzers membrane, we did not find any preference in favor of successful 4 hour hemodialysis sessions. We didn’t encounter any particular adverse effects related to citrate dialysate. The patients received adequate dialysis dose, the biological and hematological parameters were satisfactory.

HEPARIN-FREE 4 HOUR STANDARD HEMODIALYSIS SESSIONS WITH CITRIC ACIDE CONCENTRATE (CITRASATE): A SINGLE CENTRE RETROSPECTIVE COMPARATIVE STUDY WITH ANALYSIS OF THE CONFOUNDING FACTORS

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INTRODUCTION AND AIMS: Heparin-free 4 hour hemodialysis session in patients with high bleeding risk is still unresolved. Several studies suggest specific membranes or citric acid dialysate in order to reduce the heparin requirement. In this study, we assess the effect of citrate dialysate and analyze the influence of vitamin K antagonist and anti-platelet agents. The role of mechanical factors like blood flow and type of dialyzers is also analyzed which may improve success rate of heparin-free hemodialysis.

METHODS: This retrospective study was performed from 1st January 2014 to 31st December 2016 in the hemodialysis center of the University hospital of Nice. The inclusion criteria were hemodialysis sessions programmed for 4 hours with citrate dialysate and bi-punctured blood circuit. We calculated the percentage of successful 4 hours (±15 minutes) sessions performed with no circuit-clotting or other events leading to premature interruption of the session. The sessions were divided in three groups: success rate for group A (no-heparin) is compared to group B (2500 units) or group C (5000 units of dalteparin). Exact fisher test was used to compare categorical variables between two groups and a p-value <0.05 was considered as significant.

RESULTS: During the period, 100 chronic hemodialysis patients (64 men and 36 women), with average dry body weight of 69.5 (±17.3) kg, were sorted. In total, 4924 hemodialysis sessions have been performed of which 1932 (39%) in group A, 2659 (54%) in group B and 333 (7%) in group C. The percentage of successful sessions was similar in three groups: 93.5% in group A, 92.3% (p=0.07) in group B and 95.5% (p=0.22) in group C. The patients taking vitamin K antagonist and Clopidogrel were similar in each group and no differences was found in patients with successful sessions. Only acetylsalicylic acid was significantly (p<0.001) different in group B in favor of successful sessions. The average flow rates were similar 357, 357 and 372 ml/min in each group with 19%, 26% and 17% of missing data respectively due to the dysfunction of computer recording box. No differences were found in favor of success rate. But we need to stratify the blood flow rate and analyze further to have more informations. The sessions were performed with 8 different types of dialyzers including low, middle and high permeability membranes. In an univariate analysis on dialyzers membrane, we did not find any preference in favor of successful 4 hour hemodialysis sessions. We didn’t encounter any particular adverse effects related to citrate dialysate. The patients received adequate dialysis dose, the biological and hematological parameters were satisfactory.
CONCLUSIONS: Our preliminary results show that citrate dialysate is safe and effective for 4-hour hemodialysis sessions and there is no supplementary benefit to intradialytic heparinization or specific costly membrane to perform a four-hour hemodialysis session in high bleeding risk patients. This analysis cannot be extended to critically ill patients with high inflammatory states and multi-visceral failure. Further studies are required to confirm this hypothesis.