Impact of Long-Term Citrate Dialysate Use on Survival in Haemodialysis Patients

Guillaume Séreta Pierre-yves Durandb Wael El-Hagganc Frédéric Lavainned
Muriel Menanteaè Angelo Testaf Victorio Menoyob on behalf of Medial Study Group (France)

a Centre ECHO, Pôle Santé Sud, Le Mans, France; b Centre ECHO, Hôpital Bretagne Atlantique, Vannes, France; c Centre ECHO, Hôpital de Laval, Laval, France; d Centre ECHO, Pole Santé Atlantique, Nantes, France; e Centre ECHO, Pharmacie à Usage Intérieur, Nantes, France; f Centre ECHO, Hôpital privé du Confluent, Nantes, France

In December 6, 2018, the French National Agency for the Safety of Medicinal Products sent a national warning message focused on the citrate-based dialysate used for haemodialysis [1]. This alert followed data presented at the Nephrology, Dialysis and Transplantation French Society 2018 annual meeting. These data, based on the French Dialysis Registry [2] (REIN), showed an increase in mortality, up to 40%, in patients exposed to citrate-based dialysate.

The use of citrate increases gradually due to improved session tolerance with acetate-free haemodialysis [3–6]. It is also known that citric acid leads to changes in ionized calcium level during the haemodialysis session, with an increased risk of hypocalcaemia [7]. Several side effects have been identified, such as muscle spasms, cramps and arterial hypotension [8]. Several studies have evaluated the tolerance of citrate exposure without showing severe complications [9–11]. Nevertheless, follow-up periods were short, and data about cardiovascular events was lacking.

We conducted a retrospective study, issue from the MEDIAL™ database, to determine the impact of citrate exposure on the mortality of haemodialysis patients. MEDIAL™ is a French database including more than 850,000 haemodialysis sessions-year recorded.

We reviewed data of 1,169 incident patients who had started haemodialysis between January 1, 2014 and December 31, 2018. On the basis of the citrate exposure level, we identified a cohort of 409 patients divided into 2 groups: Group A (0–10% of all sessions, n = 121) and Group B (75–100% of all sessions, n = 288). Patients not receiving citrate were exposed to standard acetate. Patients transferred to other dialysis units, or other treatment modalities were excluded, as were patients for whom comorbidities were not reported. The median of follow-up was 23 ± 18 months.

Group A and B did not show any significant difference in the proportion of women (A = 39%, B = 41%; p = 0.74), central catheter use (A = 17%, B = 16%; p = 0.59), neither in the frequency of the major comorbidities: dyslipidaemia (A = 54%, B = 56%; p = 0.4), hypertension (A = 90%, B = 85%; p = 0.07), heart failure (A = 17%, B = 19%; p = 0.35), coronary artery disease (A = 18%, B = 24%; p = 0.1), stage 3 or 4 peripheral arterial disease (A = 9%, B = 9%; p = 0.69), cerebrovascular disease (A = 14%, B = 16%; p = 0.51), cardiac arrhythmia (A = 27%, B = 22%; p = 0.41) and ongoing cancer (A = 14%, B = 13%; p = 0.75). Diabetes mellitus was more frequent in group B (A = 17%, B = 30%; p = 0.001), and the population was older (A = 60.8 ± 16.6 years, B = 67.4 ± 14.7 years; p < 0.001), with a higher average BMI (A = 25 ± 5.6 kg/m², B = 26.7± 6.4 kg/m²; p = 0.01). Regarding laboratory parameters, only the mean values for serum albumin were different (38.8 ± 5.2 g/L, B = 36 ± 4.6 g/L; p < 0.001). The average values of calcemia, phosphoremia, parathyroid hormone, bicarbonatemia, haemoglobin, CRP and Kt/V were comparable between the 2 groups.

There is no significant difference in survival between groups A and B for all dialysis modalities combined (Fig. 1).

In conclusion, our study does not show an increased risk of mortality in haemodialysis patients with citrate-based dialysate, despite higher comorbidities in the citrate exposure group.

Acknowledgements

None.

This work was carried out within the institution “Association Echo-Dialyse”.

© 2019 S. Karger AG, Basel

E-Mail karger@karger.com
www.karger.com/bpu

Dr. Guillaume Séret
Centre ECHO, Pôle Santé Sud
Pôle Santé Sud, 34 rue de Guetteloup
FR-72000 Le Mans (France)
E-Mail gseret@echo-sante.com
Fig. 1. Survival comparison of haemodialysis patients with citrate-based dialysate (Group B) and dialysate without citrate (Group A). ns, non-significant.

Statement of Ethics

No approval was required.

Disclosure Statement

The authors have no conflicts of interest to declare.

Funding Sources

The study did not receive any funding.

References


