

Causes of Erythropoietin Resistance in Hémodialysis Patients

Research Article

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Abstract

We report a study of 87 chronic hemodialysis patients, for an average hemodialysis duration of 8.41 years (range: 8 months to 32 years), sex ratio 1, 8, with an average age of 44.85 years. The prevalence of anemia is 66%. The average Hb level at 10.11 g / dl. The average of the ferritinemia at 493.44 ng / ml. Erythropoietin administered in 90% of the cases, and injectable iron in 38%. We included all chronic hemodialysis patients who had hemoglobin level lower than 10 g / dl and receiving a maximum dose of erythropoietin (300 IU / Kg / week) during the aforementioned period. The prevalence of anemia : 66%. The average Hb level at 10.11 g / dl. The average of the ferritinemia at 493.44 ng / ml (range: 12 and 5000).

There are 12 cases resistant to erythropoietin. Hyperparathyroidism is the most common cause of erythropoietin resistance (50%), followed by hemorrhagic causes (41.7%) and lastly, hemoglobinopathies (sickle cell disease: 8.3%). In the population studied, the return to hemodialysis after renal transplantation does not constitute a cause of resistance to erythropoietin.

Introduction

Anemia of chronic renal failure is mainly due to erythropoietin deficiency. In periodic hemodialysis is an important parameter to control due to the impact on the patient's quality of life and in the reduction of cardiovascular complications [1-3]. The use of erythropoietin (EPO) is wide with needs constantly increasing to reach the objectives of the consensus recommendations. The causes of resistance to EPO are multiple, sometimes of severe etiologies requiring heavy therapy [4].

Materials and methods

We report a study of 87 chronic hemodialysis patients, for an average hemodialysis duration of 8.41 years (range: 8 months to 32 years), sex ratio 1, 8, with an average age of 44.85 years. EPO administered in 90% of the cases, and injectable iron in 38%.

We included all chronic hemodialysis patients who had hemoglobin level lower than 10 g / dl and receiving a maximum dose of erythropoietin (300 IU / Kg / week) during the aforementioned period.

In this work, we noted the following elements: age, sex, hemoglobin level, ferritinemia, parathormone level, dose of erythropoietin, intravenous iron dose.

Results

The prevalence of anemia : 66%. The average Hb level at 10.11 g / dl. The average of the ferritinemia at 493.44 ng / ml (range: 12 and 5000 in a beta thalassemic patient).

There are 12 cases resistant to erythropoietin: 06 men and 06 women with a sex ratio of 1. The age of our patients (50%) are between 30 and 60 years of age, patients over

60 represent 33.3% and patients under 30 represent 16.7%. Hyperparathyroidism is the most common cause of erythropoietin resistance (50%), followed by hemorrhagic causes (41.7%) and lastly, hemoglobinopathies (sickle cell disease: 8.3%). In the population studied, the return to hemodialysis after renal transplantation does not constitute a cause of resistance to erythropoietin.

Discussion

The prevalence of anemia is 66%. The average Hb level at 10.11 g / dl. The literature reported a 75% prevalence of anemia (Hb <10 g / dl) in chronic hemodialysis patients [5].

In total, 12 out of 87 (13,7%) chronic hemodialysis patients were included in our study. The average age of the patients is 46.16 years. Men represent 50% of the patients. If the literature reports other causes of resistance to erythropoietin: anti-EPO antibodies, erythropoietin hyposensitivity, chronic infections such as parvovirus B19, aluminum overload. In our study, medullary fibrosis by secondary hyperparathyroidism is the most frequent, followed by hemorrhagic causes and hemoglobinopathies. The assay of anti-EPO antibodies and the search for an infection by the parvovirus B19 are not common practice in our service [6-8].

Conclusion

The use of recombinant EPO has contributed to the management of increasingly fragile patients on dialysis, requiring permanent hemoglobin concentrations above 10 g / dL. No cases in our study of central erythroblastopenia occur in specific areas (autoimmunity, history of transplantation, etc.) and generate high morbidities which

increase the care of patients on chronic hemodialysis. Early identification of the causes is necessary in order to avoid iterative transfusions with the risk of the occurrence of hemochromatosis and hyperimmunization in the event of a renal transplant project.

References

1. Bamgbola O. Resistance to erythropoietin-stimulating agents: etiology, evaluation, and therapeutic considerations. *Pediatr Nephrol.* 2010;27(2):195–205.
2. Gaweda A.E., Goldsmith L.J., Brier M.E., Aronoff G.R. Iron, inflammation, dialysis adequacy, nutritional status, and hyperparathyroidism modify erythropoietic response. *Clin J Am Soc Nephrol.* 2010;5(4):576–581.
3. Kalantar-Zadeh K., Lee G.H., Miller J.E., Streja E., Jing J., Robertson J.A. Predictors of hyporesponsiveness to erythropoiesis-stimulating agents in hemodialysis patients. *Am J Kidney Dis.* 2009;53(5):823–834.
4. KDIGO. KDIGO clinical practice guideline for anemia in chronic kidney disease. *Kidney Int Suppl.* 2012;2:279–335.
5. KDOQI. KDOQI Clinical Practice Guideline and Clinical Practice Recommendations for anemia in chronic kidney disease: 2007 update of hemoglobin target. *Am J Kidney Dis.* 2007;50(3):471–530.
6. Locatelli F, Covic A, Eckardt K.U, Wiecek A, Vanholder R, ERA-EDTA ERBP Advisory Board. Anaemia management in patients with chronic kidney disease: a position statement by the Anaemia Working Group of European Renal Best Practice (ERBP) *NDT* 2009;24(2):348–354.
7. Macdougall I.C., Cooper A.C. Erythropoietin resistance: the role of inflammation and pro-inflammatory cytokines. *Nephrol Dial Transplant.* 2002;17(S11):39–43.
8. National Kidney Foundation K/DOQI clinical practice guidelines and clinical practice recommendations for anemia in chronic kidney disease. *Am J Kidney Dis.* 2006; 26(Suppl. 3):1–145.