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Effect of Intravenous and Oral Ascorbic Acid in Hemodialysis Patients with Anemia and Hyperferritinemia

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Anemia is a common complication of ESRD patients. Hemodialysis patients with anemia and hyperferritinemia often develop resistance to recombinant human erythropoietin (EPO). Ascorbic acid is believed to improve anemia in hemodialysis patients. We evaluated the efficacy of intravenous and oral ascorbic acid on Epo-hyporesponsive anemia in hemodialysis patients with hyperferritinemia. Forty-seven of 156 hemodialysis patients with Hb <11g /dL and ferritin levels greater than 300 ng/ml were prospectively followed up. Patients were randomly divided into three groups. 16 patients had received standard care (group 1), 17 patients had received standard care and daily oral ascorbic acid at a dose of 500 mg/day (group 2) and 14 patients had received standard care and 300 mg of intravenous vitamin C with each dialysis session (group 3). Each groups were similar in clinical characteristics. Blood samples for measurement of Hemoglobin, hematocrit, serum iron, ferritin, transferrin saturation and EPO dose were obtained at baseline and after three months of treatment. After 3 months, Hemoglobin and hematocrit and transferrin saturation levels significantly increased in group 2,3 ($p<0.05$) but not changed in group 1. EPO dosage and ferritin levels decreased in group 2,3 ($p<0.05$). There was no difference in group 2 and 3. In conclusion, Our study has demonstrated that intravenous or oral ascorbic acid therapy can improve anemia, hyperferritinemia and EPO resistance in hemodialysis patients. The effect of intravenous and oral ascorbic acid are similar. Further studies are needed to determine ascorbic acid dosing optimization

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