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Influence of thyroid function on the dose of erythropoietin used in patients undergoing maintenance hemodialysis

Wei Yang, Yuwei Kang, Shijie Ma, Wei Zhou, Xuyang Luo, Yi Fan, Fei Deng
Department of Internal Medicine-Nephrology, Department of Nephrology, School of Medicine, University of Electronic Science and Technology, Sichuan Academy of Medical Sciences, Sichuan Provincial PeoplesHospital,Chengdu610072, China;, China

Objectives : Many maintenance hemodialysis patients have abnormal thyroid function, and thyroid hormone can promote erythropoietin(EPO) production, but the effect of thyroid function on the dose of EPO used is not clear at present.
Methods : One hundred and twenty patients who initially underwent maintenance hemodialysis between January 2022 and January 2023 were selected, and the basic clinical data of the patients were collected, including gender, age, type of dialysis access, underlying disease, primary renal disease, hemoglobin, calcium, phosphorus, and BMI, etc., and they were excluded from suffering from other illnesses that would lead to poor results in the treatment of EPO, such as gastrointestinal bleeding and iron deficiency, etc., and finally, 112 patients were included in the study. The patients' thyroid hormones were also collected routinely: total thyroxine (TT4), total triiodothyronine (TT3), thyroid-stimulating hormone (TSH), free thyroid hormone (FT4), free triiodothyronine (FT3), antithyroglobulin antibodies (TGAb), and antithyroid peroxidase antibodies (TPOAb), and according to their hormone levels, the patients were divided into three groups : normal thyroid function group (n=90), subclinical hypothyroidism group (n=15), and subclinical hyperthyroidism group (n=7). Data on erythropoietin use were followed up for 6 months and averaged to compare the difference in erythropoietin dose among the groups. SPSS26.0 statistical software was taken to analyze the data, and $P < 0.05$ was considered as statistically significant difference.
Results : Of the 112 patients, a total of 59 (52.68%) were female and 53 (47.32%) were male. There was no significant difference between the groups in terms of gender, age, type of dialysis access, underlying disease, primary renal disease, blood calcium, blood phosphorus, and BMI ($P > 0.05$). A total of 62 (55.36%) were using EPO, 12 (80%) were subclinical hypothyroid patients, 47 (52.22%) were patients with normal thyroid function, and 3 (42.86%) were subclinical hyperthyroid patients. The mean monthly dose of EPO used was higher in the subclinical hypothyroidism group than in the normal thyroid function group ($P=0.000$) and the subclinical hyperthyroidism group ($P=0.000$); the dose of EPO per kilogram of body weight was also higher than in the normal thyroid function group ($P=0.000$) and the subclinical hyperthyroidism group ($P=0.006$).
Conclusions : In maintenance hemodialysis patients, the dose of erythropoietin required for similar hemoglobin levels is significantly higher in patients with subclinical hypothyroidism than in patients with normal thyroid function. Therefore, clinical assessment of thyroid function in maintenance hemodialysis patients may provide some assistance in adjusting the dose of erythropoietin used.