BONE MINERAL DENSITOMETRY AND EFFECTING FACTORS IN PATIENTS WITH SUCCESFUL RENAL TRANSPLANTATION

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OBJECTIVES

In comparison to dialysis, renal transplantation(RT) may be more beneficial in improving the problems developing due to uremia in patients with end stage renal disease (ESRD), though the success rates decline in disorders of the bone metabolism. Ongoing hyperparathyroidism, hypercalcemia and hyperphosphatemia following RT are also risk factors for the deterioration of existing bone diseases and acute tubular necrosis, as well (1). Various studies in RT patients with osteopenia indicated the existence of many histological structures that were not related to hyperparathyroidism. Low turnover bone lesions similar to osteoporosis (2) and even osteomalacia were detected in bone biopsies (3).

Rapid loss of the bone mass in patients with RT cannot still be prevented. Post-transplant osteodystrophy (mostly osteoporosis) and osteonecrosis are among the most important causes of long-term morbidity in patients with RT. Therefore, the factors that influence bone mineral density (BMD) following successful RT were investigated herein.

METHODS

This study evaluated 100 patients who underwent successful RT and who had normal graft functions, without active inflammation, diabetes mellitus and malnutrition. A hundred of 408 patients who received RT in our hospital were randomly included in this study. The descriptive characteristics of the patients are summarized in Table 1.
Table1: The descriptive characteristics of the patients, *the number of patients is totally 100 . the percentage is same as the numbers.
We determined the possible risk factors for osteoporosis among 72 male and 28 female RT patients. BMD was performed in all patients before and at least 1 year after RT. Pre and post RT data included gender, age at dialysis onset, age at RT, pretransplantation dialysis duration and modality, BMI, albumin, serum calcium, phosphorus, parathyroid hormone, ALP, lipid profile, smoking, menopausal status and immunsupresive treatment protocols.

RESULTS

At the time of RT 76 % of the patients had osteoporosis or osteopenia and only %24 of them had normal BMD scores in four regions (femurneck, lumber,radius and ultradistal). After the RT 70 % of them performed osteopororosis or osteopeniA while 30 % was normal. BMD scores increased (p>0.05) while the diagnosis of the bone disease did not change (p<0.05) after RT. The relation was not found between the improving of BMD and gender, age at dialysis onset, age at tran, pretransplantation dialysis duration and modality, BMI ,albumin, serum calcium, phosphorus, parathyroid hormone, ALP, lipid profile, menopausal status and immunsupresive treatment protocols. Only pre-existing osteodystrophy and smoking was found the most important risk factor of posttransplantation osteoporosis. Pre- and post-RT BMD scores as well as the means of some biochemical parameters are presented in Table 2. Statistically significant correlations were observed when all BMD scores measured both before and after RT in all patients were carefull compared. BMD scores of all four areas were shown to be increased after the transplantation (p<0.0001, Table 2). When a stratification based on patient BMD scores was performed and a comparison was made according to osteopenia/osteoporosis diagnoses, pre-transplant diagnoses were found to be significantly different from the post-transplant ones (p<0.0001)
Only the changes in radial scores were shown to be significantly different when the changes in BMD scores were evaluated according to the relevant etiology. The differences in pre- and post-transplant BMD scores in patients with polycystic kidney disease were significantly higher than those in patients with other etiologies and the changes were towards lower BMD scores (p<0.05). The type of the dialysis received, the source of the donor organ (cadaveric vs living donors), the use of any post-transplant medications for osteoporosis treatment and the development of acute rejection were all associated with the changes in BMD scores (p>0.05).
Smoking was identified as an important determinant of both pre- and post-transplant changes in BMD scores. Accordingly, non-smoker patients with normal BMD scores prior to transplantation were more likely to maintain normal BMD scores after transplantation than smokers with normal BMD scores prior to RT . Smokers with osteopenia and/or osteoporosis prior to RT were prone to more severe osteopenia and/or osteoporosis following transplantation (p<0.05, Table 2).

Table 1: The descriptive characteristics of the patients, *the number of patients is totally 100. the percentage is same as the numbers.

Table 2. Characteristic of Pre and Post Renal Transplantation patients and their BMD Scores. *the number of patients is totally 100, the percentage is same as the numbers.

CONCLUSIONS

In conclusion, this study revealed that despite the increase in BMD scores following RT, this improvement in BMD scores was not reflected to the BMD-associated diagnoses in general and pre- as well as post-transplant BMD-associated diagnoses did not differ significantly in patients with RT. The most important factors that influence the development of osteopenia and/or osteoporosis following RT are the pre-transplant BMD values. Therefore, it is essential to closely and regularly follow the patients for pre-transplant BMDs and to administer the appropriate medical treatment when necessary.

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