

Hypophosphatemia, a Common Complication after Kidney Transplantation

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Introduction

Hypophosphatemia is a common complication after successful kidney transplantation, occurring in 90% of patients at the beginning of the post-transplant period. The fibroblast growth factor 23 (FGF-23) levels play an important role in the pathogenesis of this complication. This phenomenon is usually limited to the early post-transplant period, but it may persist for more than 10 years. Today, it is still debatable whether or not a low phosphate level is an independent risk factor for any adverse outcome, or just a marker of other causes. We therefore investigated the prevalence and natural course of post-transplant hypophosphatemia in our center. Its relationship with long-term outcomes.

Materials and Methods

All kidney patients transplanted during 1 January 2008 to 30 April 2018 were included. They received a standard immunosuppression (triple therapy with tacrolimus or cyclosporine in combination with mycophenolate mofetil and prednisolone). The lowest serum phosphate concentration available was used in the study.

Post-transplant hypophosphatemia was considered to be severe (lowest serum phosphate [< 0.5 mmol / L]), moderate ([$0.5-0.7$ mmol / L]) and mild ([$0.7- 0.8$ mmol /

l]). We used a serum creatinine obtained at the same day as the lowest serum phosphate.

The evaluation of rejection was based on a histological analysis performed by a pathologist and classified according to the Banff classification.

Results

- This study included 55 patients, 44 kidney recipient patients from a living donor (80%) and cadaveric donor in 11 cases (20%).
- The median age of renal transplantation was 34 years, minimum age 20 years maximum age 65 years with a male predominance 72%.
- The initial nephropathies were respectively, chronic interstitial nephropathy in 23 cases (41%), unknown nephropathy in 21 cases (38%) followed by chronic glomerular nephropathy in 6 cases (11%).
- 12 of the patients (21%) had a serum phosphate lower than 0.5 mmol/L (severe hypophosphatemia), 22 patients (40 %) had a serum phosphate between 0.5 mmol/l and 0.7 mmol/L (mild hypophosphatemia) and 20 patients (36 %) had a serum phosphate higher than 0.7 mmol/L (low hypophosphatemia).
- The mean hypophosphatemia in our study was 0,59 mmol/L with a minimum of 0,2 mmol/L and the highest value was 0,8 mmol/L .The average of the GFR was 102 ml/min.
- 72% of renal transplant recipients had hypophosphatemia during the first year after transplantation.

- The moderate phosphate group (0,5-0,7 mmol/l) exhibited higher eGFR > 60 ml/min.
- Severe hypophosphatemia was associated with the lowest risk of death-censored and graft failure (1,8%), 5% for moderate hypophosphatemia group and 9,1% for the last group.

Discussion

Hypophosphatemia is a commonly observed phenomenon in the first year after kidney transplantation.

Previous research shows that hypophosphatemia in combination with hypercalcemia is associated with a higher risk on graft failure. Our results do not support this previous study in that we found that hypophosphatemia as such is associated with a lower risk of graft failure. Analyzing the lowest serum phosphate level reached within the first year after transplantation, we found that the absence of hypophosphatemia is associated with a higher risk of graft failure as compared to those with a hypophosphatemia. Furthermore, post-transplant hypophosphatemia was associated with a lower risk of cardiovascular mortality. In our analysis the lowest serum phosphate (lower than 0.5 mmol/L) was still significant associated with a decreased risk on graft failure. ,we do show that patients with a good kidney function and a very low serum phosphate are still at a lower risk on graft failure, but these results should be interpret with caution, only 55 patients were analyzed in this sensitivity analysis Further research with a larger population of patient with phosphate levels below 0.5 mmol/L is needed to fully draw this

Conclusion

In conclusion, hypophosphatemia is a frequent and mostly neglected observation after renal transplantation. It is associated with superior graft survival, however,

most likely because of better allograft function rather than an independent factor for graft survival. Because of the retrospective nature of our study, additional study, especially prospective study, is required to validate our findings, to evaluate chronic complications of hypophosphatemia, and to assess the necessity and indication for treatment [1-6].

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