FLUDROCORTISONE IS THE SALVAGE TREATMENT IN CASES WITH CALCINEURIN INHIBITOR RELATED HYPERKALEMIA

Y. UNSAI1, D. BALTU2, N. GONC1, B. GULHAN1, A. DUZOVA1, R. TOPAOLGLU2, A. OZON1.
1. Hacettepe University Faculty of Medicine, Department of Pediatrics, Division of Pediatric Endocrinology, Ankara, Turkey.
2. Hacettepe University Faculty of Medicine, Department of Pediatrics, Division of Pediatric Nephrology, Ankara, Turkey.

INTRODUCTION
Calcineurin inhibitors (CNIs)
Bone marrow transplantation / solid organ transplantation
Immunosuppression
Prophylaxis and treatment of graft versus host disease

CNI-related Hyperkalemia (10-43%)
Distal renal tubular acidosis?
Aldosterone resistance in mineralocorticoid receptor on distal tubules
Direct effect of CNIs on Na-K ATPase on cortical collecting tubule cells and indirect opening of ATP-sensitive K-channels

Underlying pathogenetic mechanism is not well elucidated, thus CNIs vital to transplantation is discontinued.

AIM
Two cases with CNI-induced hyperkalemia due to hyporeninemic hypoaldosteronism, successfully treated with fludrocortisone were described.

CASE 1
- 15-month-old boy
  - AML → BFM-2013 protocol
  - Day -1
    - Cyclosporine (CsA) (3 mg/kg/day)
  - Day +22
    - Hypokalemia (5.9 mEq/L)
    - Hypoaldosteronism (133 mEq/L)
- Case 1
  • CsA was used for 6 months
  • Fludrocortisone was tempered and ceased following CsA cessation
  • Electrolyte imbalance was not observed.

CASE 2
- 3-year-old girl
  - Agenesis of the left kidney and cystic right kidney
  - +NF1 beta mutation
  - 5 years-old
    - Hypokalemia (7.37 mEq/L)
    - Hypoaldosteronism (128 mEq/L)
- Case 2
  • Fludrocortisone is continued without dose adjustment for three years
  • Electrolyte imbalance was not observed.

ALLOGENIC BONE MARROW TRANSPLANTATION
Day -1
- Cyclosporine (CsA) (3 mg/kg/day)
Day +22
- Hypokalemia (5.9 mEq/L)
- Hypoaldosteronism (133 mEq/L)

The patient was normotensive, hemolysis was ruled out.

CONCLUSIONS
- Isolated hyperkalemia in bone marrow and solid organ transplant recipients may be due to hyporeninemic hypoaldosteronism related to CNIs (CsA and tacrolimus).
- If hyperkalemia is observed in cases using CNI, renin and aldosterone should be measured.
- Fludrocortisone is a safe and effective treatment in CNI-induced hyperkalemia in pediatric transplant patients.
- Fludrocortisone provides maintaining CNIs fundamental treatment for pediatric transplantation.

INTERACTION INFORMATION
Contact Information
Yagmur Unsal, MD
Department of Pediatrics
Division of Pediatric Endocrinology
Hacettepe University Faculty of Medicine, Ankara, 06230, TURKEY
Phone: +905367950760
Email: yagmurunsal@yahoo.com