International Journal of Children and Adolescents

Original Article
IJCA, Vol. 2, No. 1, Jan, 2016.11-13.

Seizure disorders after renal transplantation in children

Zohreh Kalbassi: (**Corresponding author*) Assistant professor of Pediatric Department, Ali-Asghar Children's Hospital, Iran University of Medical Science, Tehran, Iran. z_kalbassi@yahoo.com
Ladan Afsharkhas: Assistant professor of Pediatric Neurology Department, Ali-Asghar Children's Hospital, Iran University of Medical Science, Tehran, Iran. drafshar1@yahoo.com
Rozita Hoseini: Assistant professor of Pediatric Nephrology Department, Pediatric renal transplantation research center, Iran University of Medical Science, Tehran, Iran. rozitzhoseini@yahoo.com
Narjes Afrooz: General physician, Ali-Asghar Children's Hospital, Iran University of Medical Science, Tehran, Iran. dr.narjesafrooz@yahoo.com

Received: 10 Mar 2015 Accepted: 20 Nov 2015

Abstract

Background and Objective: Some neurologic complications may be detected after renal transplantation in children including tremor, peripheral neuropathy, altered level of consciousness and seizure. The aim of our study was to detect the prevalence of seizure after renal transplantation and its risk factors in pediatric age groups.

Methods: In this descriptive study, 102 patients 5-14 year old in Ali-Asghar children's hospital with renal transplantation were enrolled from December 2011 to December 2013. Data about age, gender, primary renal diseases, seizure type, history of previous seizure, and causes of seizure were analyzed through SPSS v.18.

Results: Mean (SD) age was 11.69±2.52 years. Fifty seven cases (57.8%) were male. Twelve (11.8%) cases had seizures. Mean age of seizure group was lower than group without seizure (P= 0.001). Causes of seizures were hypertension in 7(58%), febrile seizure in 3(25%), meningoencephalitis in 1(8.5%) and subdural hematoma in one patient (8.5%). Eleven (91.7%) patients had generalized seizure. Seven (6.9%) of all patients had history of previous seizures and 6(86%) were in seizure group (p=0.000). Four cases died and 2(50%) were in seizure group (P= 0.01).There was no significant relationship between gender, primary renal disease, and seizure occurrence after transplantation.

Conclusion: In our study, hypertension was common cause of seizure disorder after renal transplantation. Seizures were higher in patients with lower age at transplantation time and with seizure history before transplantation. It is recommended to have more attention prior renal transplantation with neurology consultation and particular management of hypertension after renal transplantation.

Keywords: Child, Kidney transplantation, Seizure

Introduction

Kidney transplantation may be complicated by different factors such as infections, ischemia of graft, acute or chronic rejection and neurologic problems. Neurologic complications may occur in 30-60% of cases and there is a relationship between them and mortality rate (1-3). Altered level of consciousness, seizures, pontine myelinolysis, hypertensive encephalopathy, Immunosuppressive drug toxicity, central nervous system (CNS) opportunistic infection, cranial nerve palsies, visual disturbances, brain mass lesions, myopathy, polyneuropathy, sensory complaints (numbness, paresthesia), abnormal movements (tremor) and headaches are common post transplantation neurologic presentations (3,4).

Etiology of seizures are multifactorial and including severe hypertension, hypocalcemia, hypomagnesemia, CNS infections, immunosuppressive medications, acute allograft rejection, epilepsy, cerebral vascular accidents and brain tumors (1,4-7). Because of increasing improvement in renal transplantation outcome, consumption of new immunosuppressive medications, insufficient studies about neurologic complications after renal transplantation, this study designed to evaluate frequency of seizure disorders and causes of seizure in children with history of renal transplantation.

Methods

In this cross sectional study, children and adolescents 5-14 year old with history of renal transplantation that referred to nephrology clinic of Ali-Asghar hospital were enrolled from December 2011 to December 2013. All patients received cyclosporine, mycophenolate mofetil and prednisolone as maintenance therapy. They were evaluated for seizure disorders following renal transplantation. Data about age, gender, type of renal diseases as etiology of ESRD, type of seizure (partial or generalized), causes of seizure, history of previous seizure, familial history of epilepsy, time distance between transplantation and seizure occurrence, and mortality rate were recorded from patients' medical records. Statistical analysis was performed using the SPSS software version 14. The project was approved by Committee of Ethics of Iran University of Medical Sciences.

Results

One hundred and two patients were studied. Mean age was 11.69±2.52 years. Fifty seven cases (57.8%) were male. Primary renal disorders were congenital renal hypodysplasia 27(26.5%), nephrotic syndrome and glumerolonephritis 24 (25.5%), reflux nephropathy and neurogenic bladder 22 (26.5%), metabolic and renal syndromes 14 (15.8%), and miscellaneous 5(5.6%).

Twelve patients (11.8%) had seizures. Mean (SD) age of seizure group was 8.75±4.01years which was lower than group without seizure. We found a relationship between seizure occurrence and age of patients (P=0.001 CI 95% lower= -4.59, upper = -1.28). Fifty percent of seizure group were male. Causes of seizures were hypertension in 7 (58%), febrile seizure in 3(25%), meningoencephalitis in one (8.5%) and subdural hematoma in one (8.5%) cases. Eleven (91.7%) patients had generalized and one case (8.3%) had partial seizure. Seven (6.9%) of all patients had history of previous seizures and 6(86%) of them were in seizure group. There was a significant relation between seizure occurrence and history of previous seizure (P=0.000).

Time distance between renal transplantation and seizure was 14.33±13.64 months (one month to three years). Four cases died and 2(50%) were in seizure group and significant relation was detected between seizure occurrence and mortality (P=0.01).

There was not significant relationship between gender, type of primary renal disease, type of seizure, with the emergence of seizures after renal transplantation.

Discussion

Recent studies have reported decreasing graft rejection and increase in graft survival in pediatric renal transplantation. It is related to many reasons such as change in care of transplant patients, improvement of immunosuppressive therapy and increased experience of urologists (8,9). Renal transplantation may lead to some complications. Neurologic complications in children with renal transplantation may be detected especially near the surgery time. Common neurologic complications include seizure, loss of consciousness, CNS infection, cranial nerve palsies, myopathy, and neuropathy (1,10,11).

In our study, 11.8% of cases had seizures. Different reports about frequency of seizures after renal transplantation may be due to different etiologies of ESRD, different age of recipients, different treatment protocols, and different prevalence of hypertension and electrolyte imbalances after transplantation.

We found that the most common cause of seizure after renal transplantation was hypertension. Electrolyte abnormalities such as hypocalcemia, hyponatremia and hypomagnesemia are common causes of seizure after renal transplantation (12,13), but we found no electrolyte disturbances as etiology of seizure. In a study by Awan et al (3), hypertension, fever, infections, acute rejection, intracranial pathology were main causes of seizure after renal transplantation. In another study by McEnry et al (4), 154 children with renal transplantation were evaluated and 48 cases of them had seizure. Hypertension was the most common cause of seizures in this study such as our finding.

In our study, 7 cases had history of seizure before transplantation that 6 were in seizure group after transplantation and all of them discontinued treatment of seizure more than two years before renal transplantation. It suggests that physicians pay more attention to these cases regarding consult with a child neurologist or taking an EEG before renal transplantation. We also found that seizure was more common in lower age recipients and it occurs mostly during the first year of transplantation.

Conclusion

Seizure disorders after renal transplantation are common in children. It is recommended to aware the parents about risk of seizures after renal transplantation. We also found hypertension is an important risk factor for seizure after renal transplantation in children. We recommend paying more attention to pediatric renal transplant recipients

regarding the history of seizure before transplantation and control of blood pressure after transplantation.

Acknowledgement

We would like to thank personnel of Medical Records Department of Ali-Asghar children's hospital.

Conflicts of interest: None declared.

References

1. Basiri A, Otoukesh H, Simforoosh N, Hosseini R, Farrokhi F. Kidney transplantation in children with augmentation cystoplasty. J Urolog. 2007;178(1): 274–277.
2. Otukesh H, Hoseini R, Rahimzadeh N, Hosseini S, Ahmadpoor P, Javadi Larijani F. The role of Ischemia reperfusion damage on renal transplant, what are the new treatments? J Ped Nephrol. 2013;1(1):1-7.
3. Awan AQ, Lewis MA, Postlethwaite RJ, Webb NJ. Seizures following renal transplantation in childhood. Pediatr Nephrol. 1999; 13: 275–277.
4. McEnery PT, Nathan J, Bates SR, Daniels SR. Convulsions in children undergoing renal transplantation. J Pediatr.1989; 115: 532–536.
5. Gross ML, Pearson RM, Sweny P, Moorhead JF. Convulsions associated with cyclosporin A in renal transplant recipients. Br Med J. 1985: 290: 555.
6. Hongjun G, Xiangdong L, Taisheng L, Shangguang L, Fang LF, Yu D, et al. Diagnosis and Treatment of Status Epilepticus in a Pediatric Renal Recipient. Hindawi Publishing Corporation Case Reports in Transplantation, 2011.
7. Kranz B, Vester U, Nadalin S, Paul A, Broelsch CE, Hoyer PF. Outcome after kidney transplantation in children with thrombotic risk factors. Pediatr Transplant. 2006;10:788.
8. Otukesh H, Sharifian M, Simfroosh N, Basiri A, Hoseini R, Sedigh N, et al. Outcome of renal transplantation in children with low urinary tract abnormality. Transplant Proc. 2005;37(7):3071-4.
9. Horslen S, Barr ML, Christensen LL, Ettenger R, Magee JC. Pediatric transplantation in the United States, 1996–2005. Am J Transplant. 2007;7: 1339–1358.
10. Otukesh H, Sharifian M, Basiri A, Simfroosh N, Hoseini R, Sedigh N, Golnari P, Rezai M, Fereshtenejad M. Mycophenolate mofetil in pediatric renal transplantation. Transplant Proc. 2005;37(7):3012-5.
11. Otukesh H, Hoseini R, Rahimzadeh N, Fereshtehnejad SM, Simfroosh N, Basiri A. et al.Outcome of renal transplantation in children: a multi-center national report from Iran. Pediatr Transplant. 2011;15(5):533-8.
12. Sevmis S, Karakayali H, Emiroglu R, Akkoc H, Haberal M. Tacrolimus-related seizure in the early postoperative period after liver transplantation, Transplant Proc. 2007; 39(4): 1211–1213.
13. Torricelli F M, Watanabe A, David-Neto E, William Carlos, Nahas W C. Current management issues of immediate postoperative care in pediatric kidney transplantation. CLINICS.2014;69(S1):39-41.