



The Egyptian Society of Chest Diseases and Tuberculosis
Egyptian Journal of Chest Diseases and Tuberculosis

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ORIGINAL ARTICLE

Study of the pattern of lower respiratory tract infection within the first year in renal transplant patients



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Received 24 January 2015; accepted 22 March 2015

Available online 11 April 2015

KEYWORDS

Renal transplantation;
Pneumonia

Abstract Renal transplantation is the most common type of solid organ transplantation, although immunosuppressive therapy is essential for the viability of the graft it leads to increased incidence of infection, especially urinary tract and respiratory tract infections.

The aim of the present study: To study the pattern of lower respiratory tract infection within the first year in renal transplant patients.

Subjects: Sixty patients receiving renal transplantation because of end stage renal disease were followed up for one year to detect any episode of lower respiratory tract infection.

Methods: On suspicion of respiratory tract infection patients were subjected to sputum and blood examination together with doing bronchoscopy and BAL in the first 24 h after presentation, all samples were subjected for microbiological examination including quantitative culture for diagnosis of the etiologic organism.

Results: Thirteen patients had episodes of pneumonia (21.66%), the most common cause of pneumonia was single organism bacterial infection (46.1%) followed by mixed bacterial infection (23.1%), then TB and cytomegalo virus infection (15.4% each), etiologic organism was identified in 100% of cases, 11 patients had good response to anti-microbial therapy and showed no signs of rejection or impaired graft function and 2 patients died because of pneumonia.

Conclusion: Lower respiratory tract infection is a serious complication after renal transplantation. Bacterial and mixed bacterial infections are the most common etiologies, proper diagnosis using all tools of diagnosis especially bronchoscopy and quantitative culture can help in diagnosis and prevent the overuse of antibiotics.

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Peer review under responsibility of The Egyptian Society of Chest Diseases and Tuberculosis.

<http://dx.doi.org/10.1016/j.ejcdt.2015.03.025>

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Introduction

Renal transplantation is the most common type of organ transplantation. It has become the treatment of choice for most patients with end-stage renal disease (ESRD). Marked improvements in early graft survival and long-term graft function have made kidney transplantation a more cost-effective alternative to dialysis. Before the advent of immunosuppression, renal transplantation was limited to human leukocyte antigen (HLA)-identical (HLA-ID) siblings and was not applicable to the vast majority of patients with ESRD [1]. The introduction of combined azathioprine-steroid therapy in 1963 produced encouraging results and became the mainstay of immunosuppression. Although this therapy improved the results of transplantation, acute rejection and complications associated with steroid therapy persisted [1]. The introduction of cyclosporine in 1983 significantly improved the outcomes of all solid-organ transplants by reducing the risk of rejection. Further innovations, including anti-T cell antibodies (both monoclonal and polyclonal preparations), as well as other maintenance immunosuppressants (e.g., tacrolimus, mycophenolate, and sirolimus), have made a significant impact on both patient and graft survival [2]. Currently, 1-year patient and graft survival rates exceed 90% in most transplant centers [1]. Although much progress has been made in the survival of the grafted kidney; infection is still a major complication among renal transplant recipients, including pneumonia, one of the most frequent life-threatening complications of long-term immunosuppression [3]. A broad range of potential pathogens are involved, of which the most common are bacterial and opportunistic infections [4–6]. Early diagnosis and accurate treatment are important in curing such an infection.

The aim of the present study

To study the pattern of lower respiratory tract infection within the first year in renal transplant patients in Kuwait.

Subjects

The study was conducted at the Kuwait Center of Organ Transplantation in association with Chest Disease Hospital and Al-Rashid Center for Allergy and Respiratory Diseases. The study was done in the period between January 2012 and June 2014.

The study included 60 patients with ESRD who underwent renal transplantation and followed up for one year to detect any episode of pneumonia, all patients were on combination immunosuppressive therapy and all received trimethoprim-sulphamethoxazole for prophylaxis. Patients were classified into 3 groups:

Group 1: including 20 patients received living – related kidney transplantation.

Group 2: including 20 patients received living – unrelated kidney transplantation.

Group 3: including 20 patients received cadaveric kidney transplantation.

Written informed consent was taken from all patients before sharing in the study and before bronchoscopy.

Methods

All patients were followed for one year after transplantation and on occurrence of respiratory symptoms the patients were subjected to the following:

- 1- History taking and clinical examination.
- 2- Complete blood count.
- 3- Blood culture and blood sample sent for organism specific anti-body titers [7].
- 4- Liver and kidney functions.
- 5- Urine and stool analysis and culture.
- 6- Chest X Ray.
- 7- HRCT chest with contrast.
- 8- Sputum study for [8]:
 - Direct microscopic examination.
 - Gram stain and Ziehl–Neelsen stain.
 - Culture and sensitivity.
 - Special test for viral, fungal elements and for *Pneumocystis carinii* pneumonia (PCP)
- 9- Bronchoscopy and Bronchoalveolar lavage [9]: Bronchoscopy was performed according to a standardized protocol within 24 h of admission in all patients (60 patients). An Olympus BF260 videobronchoscope (Olympus Medical Systems Corporation; Tokyo, Japan) was used to perform airway evaluation and BAL was done for all cases, according to radiologic assessment if the disease is localized BAL was done from the affected segment and if the infiltrate is generalized in the whole lung field BAL was done from the middle lobe or lingula, BAL was done using 120 ml of sterile saline in 6 equal aliquots and samples were sent for cytological and microbiological examination including PCR for TB and common viruses associated with infection in this group of patients ex. Cytomegalo virus and Epstein Bar virus.
- 10- Diagnosis of pneumonia was done according to the following criteria [10]:
 - Respiratory symptoms as cough, sputum production or chest pain with or without fever not explained by other causes including lung congestion and upper respiratory tract infection or oesophageal reflux.
 - Newly developed infiltrates in the CXR with exclusion of cases of pulmonary oedema.
 - Positive culture with more than 10^3 colony forming unit (CFU)/ml from sputum or BAL sample in case of bacterial pneumonia.
 - Positive special stains in sputum or BAL in case of PCP (Gomori methenamine silver stain) or mycobacteria (Ziehl–Neelsen stain).
 - Elevated IgM titer in case of atypical pneumonia (- Mycoplasma, Chlamydia or legionella).
 - Presence of hyphae and positive fungal culture from sputum or BAL in case of fungal pneumonia.
 - Elevated IgM titer of specific virus or positive PCR of virus in sputum or BAL.

Statistical analysis

All statistical analyses were conducted using the software package SPSS 20.0 for Windows® (SPSS Inc., Chicago, IL, USA). Data are presented as frequencies for categorical

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