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ORIGINAL ARTICLE

Pulmonary tuberculosis in patients with chronic renal failure at Zagazig University Hospitals

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Abstract The incidence of active TB and attendant mortality is increased in patients with impaired cellular immunity, such as HIV infected patients, solid organ and stem cell transplant recipients and patients with end-stage renal failure. The relative risk for TB varies with the type of immunodeficiency and mortality rates may be as high as 75%. End-stage renal disease (ESRD) and particularly uraemia is a known contributor to immunosuppression.

The aim of this work: The aim of this work was to evaluate the increasing risk of pulmonary tuberculosis among patients with chronic renal failure and the impact of hemodialysis.

Patients and methods: This study was carried at both Nephrology Unit and Chest Department, Zagazig University Hospitals during the period from April 2012 to Jan 2013. The study included a total number of 140 patients with chronic renal failure (92 males and 48 females), with mean age of 49 ± 6.4 years. Patients were classified to three groups: Group 1: Included 40 Patients with chronic renal failure and not on dialysis. Group 2: Included 50 Patients with chronic renal failure and on regular hemodialysis three sittings per week for less than 1 year. Group 3: Included 50 Patients with chronic renal failure and on regular hemodialysis three sittings per week for more than 1 year. All patients were subjected to: history taking and medical evaluation including general and local

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examinations, routine laboratory investigations, Plain chest X-ray; Posteroanterior and lateral views for all patients, Sputum Ziehl–Neelsen staining and Sputum induction in patients who had chest X-ray suspecting pulmonary TB without expectoration and Tuberculin skin testing. Selected cases were subjected to fiberoptic bronchoscopy to obtain BAL for ZN staining.

Results: 16 patients (11.4%) proved to have pulmonary tuberculosis by +ve ZN stain for acid fast bacilli in either sputum or BAL, 28 patients (20%) were suspected to have pulmonary tuberculosis by radiological suspension and –ve sputum ZN for acid fast bacilli, 6 patients (4.3%) proved to have extra-pulmonary TB while 90 patients (64.3%) were free from tuberculosis. There were no significant differences among different groups as regards infection by TB.

Conclusion: Patients with chronic renal failure are at increased risk for pulmonary and extra pulmonary tuberculosis and should be screened routinely and carefully for early detection of TB infection.

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Introduction

The incidence of active TB and attendant mortality is increased in patients with impaired cellular immunity, such as HIV infected patients, solid organ and stem cell transplant recipients, and patients with end-stage renal failure. The relative risk for TB varies with the type of immunodeficiency and mortality rates may be as high as 75% [1]. This emphasizes the particular importance of the cellular arm of the adaptive immune response for efficient control of *Mycobacterium tuberculosis* [1–4]. Moreover, the presence of *M. tuberculosis*-specific CD4+ T-cell immunity is used as a surrogate marker for a previous contact [5]. Despite the availability of highly efficacious treatment for TB, it remains a major global health problem. In 1993, the World Health Organization (WHO) declared TB a global public health emergency, at a time when an estimated 7–8 million cases and 1.3–1.6 million deaths occurred each year. In 2010, there were an estimated 8.5–9.2 million cases and 1.2–1.5 million deaths (including deaths from TB among HIV-positive people). TB is the second leading cause of death from an infectious disease worldwide (after HIV, which caused an estimated 1.8 million deaths in 2008 [6].

It is likely that TB will be seen more frequently in patients with chronic kidney disease (CKD) as people from the areas of the world with high background levels of TB are also at increased risk of CKD [7]. Active TB in immuno-compromised patients can pose a number of challenges. Due to the impaired immune response, patients maybe clinically oligosymptomatic in the beginning of active disease, and its diagnosis is often delayed due to atypical presentations and more frequent extra-pulmonary dissemination. Active TB is further aggravated by a significantly higher morbidity due to a more fatal course in the face of a weakened immune system [1]. In addition, treatment is frequently complicated due to complex drug interactions and altered pharmaco-kinetics [2,4]. End-stage renal disease (ESRD) and particularly uraemia is a known contributor to immuno-suppression. The causative factors of the immunosuppression are complex and disrupt the cell-mediated immune functions which include identification and killing of intracellular pathogens such as *M. tuberculosis* [8].

The aim of this work was to evaluate the increasing risk of pulmonary Tuberculosis among patients with chronic renal failure and the impact of hemodialysis.

Patients and methods

This study was carried at both Nephrology Unit and Chest Department, Zagazig University Hospitals during the period from April 2012 to Jan 2013. The study included a total number of 140 patients with chronic renal failure (92 males and 48 females), with mean age of 49 ± 6.4 years. Patients were classified to three groups:

- **Group 1:** Included 40 Patients with chronic renal failure and not on dialysis.
- **Group 2:** Included 50 Patients with chronic renal failure and on regular hemodialysis three sittings per week for less than 1 year.
- **Group 3:** Included 50 Patients with chronic renal failure and on regular hemodialysis three sittings per week for more than 1 year.

All patients were subjected to the following:

- (1) History taking and medical evaluation including general and local examinations.
- (2) Laboratory investigations:
 - Serum creatinine & blood urea.
 - ALT & AST & serum bilirubin & serum albumin.
 - Complete Blood Count (CBC).
 - Erythrocyte Sedimentation Rate (ESR).
 - Fasting & post prandial blood glucose level.
- (3) Plain chest X-ray: Postero-anterior and lateral views for all patients.
- (4) Sputum Ziehl–Neelsen staining and Sputum induction in patients who had chest X-ray suspecting pulmonary TB without expectoration. The patient was considered suspect for pulmonary tuberculosis if there were signs or symptoms consistent with pulmonary tuberculosis and had radiological picture of the chest consistent with pulmonary tuberculosis (apical infiltrations, cavitations, calcifications or hilar lymphadenopathy) with –ve sputum ZN for acid fast bacilli [9].
- (5) Tuberculin skin testing (TST).
- (6) Bronchoscopy to obtain BAL for bacteriological examination for acid fast bacilli in 10 cases in whom Plain

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