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Research Article

CASE REPORT: IATROGENIC IMMMUNODEFICIENCY ASSOCIATED FATAL MIXED INFECTION WITH *STRONGYLOIDES, E.COLI AND FUNGAL SPORES* POST RENAL TRANSPLANT AND TOE AMPUTATION

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ABSTRACT

An immunocompromised host is not only susceptible to bacterial, fungal or viral infections, instead she can also fall prey to life threatening parasitic infections. One such critical parasitic infection is by a nematode *Strongyloides.* This parasitic infection, though fatal, belongs to the group of "Neglected Tropical diseases". Hence efforts all over the globe are aimed at eradication of it.

Over here, we report an unusual and fatal case that involves mixed infection due to three classes of organisms-

1. *Strongyloides*(Parasite)
2. *Escherichia coli* (Bacteria)
3. Fungal spores

A 45 year old male, farmer by occupation was presented to the hospital with complaints of low grade fever, 12-15 episodes of loose stools (Type 7 as per Bristol Stool chart) mucoid and greenish in color, abdominal discomfort and vomiting. He had been on immunosuppressive therapy with Tablet Prednisolone 7.5mg/taken once daily, post renal transplantation three years ago. He is known to be hypertensive, Diabetic and a regular alcoholic. Prolonged systemic diseases lead to the complications such as Double vessel Disease(DVD) and diabetic foot disease due to which, his left 2nd toe was amputated.

Over the course of stay in hospital he was found to be suffering from malnourishment, pancytopenia and renal graft failure (S.cr: 4.42mg/dl).His ultra sound reports show distended gall bladder while the GI endoscopy suggested of gastritis. Also, he was found to be severely immunocompromised with WBC count equal to 2900 cells/m3.His urine culture isolated *E.coli* while his blood cultures grew *Strongyloides*. The skin biopsy from his toe surface identified fungal spores.

He was treated extensively mainly with antibiotics, anthelmenthics, Antifungals, Renal replacement therapy and Proton pump inhibitors.

INTRODUCTION

Suppression of allograft rejection is central to successful organ transplantation, thus, immunosuppressive agents are crucial for successful allograft function [1]. The most common complications of the immunosuppressive therapy are the opportunistic infections and malignancy [2, 3]. Infections are a common cause of morbidity and mortality after transplantation and are ranked second most common cause of death post allograft transplant [4]. Oppurtunistic infections commonly observed in transplant recipients include Bacterial infections (Those caused by *Legionella spp*., *Nocardia spp., Salmonella spp*. Etc), Viral infections (Most common being *Cytomegalovirus, varicella-zoster virus, Epstein-Barr virus*), Fungal infections, Mycobacterial disease and parasitic infections [5].

A retrospective cohort study of 28,942 primary renal transplant recipients from the U.S. Renal Data System database revealed a cumulative UTI incidence of 17% during the first 6 months after transplantation; at 3 years the incidence was 60% for women and 47% for men. [6] *Escherichia coli* is the most identified uropathogen in kidney transplant recipients [7].

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Strongyloides stercoralis is an intestinal nematode of humans. It is estimated that tens of millions of persons are infected worldwide [8]. S. stercoralis is unique among intestinal nematodes in its ability to complete its life cycle within the host through an asexual autoinfective cycle, allowing the infection to persist in the host indefinitely [9]. The *S. stercoralis* life cycle encompasses both free-living and parasitic stages. Adult female worms live as parasites in the human small intestine and lay eggs in the intestinal mucosa. These eggs hatch to form rhabditiform larvae, which are shed off in the stool. Outside the human body, these larvae molt into infective filariform larvae or develop into free living adults [10].

In immunocompromised subjects, the accelerated autoinfective cycle of *S. stercoralis* can potentially lead to a fatal condition with multi-organ failure due to a massive larval invasion known as hyperinfection syndrome [11]. Bacterial infections associated with strongyloidiasis are very severe and mortality may be as high as 87% [12].

Case presentation

A 45 years old male presented to the hospital with complaints of fever, 12-15 episodes of loose stools (Identified as Type 7 of Bristol Stool chart) mucoid and greenish in colour, abdominal discomfort and vomiting. He was a farmer by profession and had undergone renal allogaft transplant for his End Stage Kidney Disease four years ago. He had been on immunosuppressive therapy with oral prednisolone of dose 7.5mg per day since then. Also he had his left second toe amputated in view of his diabetic foot disease three years ago. He was known to be type II diabetic since past 6 years and was identified with Coronary artery Disease-Double vessel Disease two months ago.

On initial clinical examination, he was conscious, coherent, obeying commands, hyperglycemic (random blood glucose= 226mg/dl) and dehydrated with body temperature of 99.8 ° F and blood pressure of 130/70 mm of Hg. His Blood workup revealed Pancytopenia and was identified to be immunocompromised. His biochemistry laboratory reports revealed hyponatremia and hypokalemia (Serum sodium = 129 Meq/L; Serum potassium = 2.4 meq/L). His renal function test suggested of graft failure (Baseline Serum Creatinine = 4.42 mg/ dl) while his liver function tests revealed hypoalbuminemia and threefold increase in Alkaline Phosphate levels (Serum albumin = 2.4 g/dl; Alkaline phosphate = 380 U/ L. His Abdominal Ultrasound showed gall bladder distension while endoscopy identified gastritis. His blood and urine samples were sent for culture and they grew *Strongyloides stercoralis* and *Escherichia coli* respectively after 48 hour incubation. Further, He also complained of itching and redness in the interdigital folds of right foot from three months. Dermatologist opinion was sought for it. Skin Biopsy was done as advised and it revealed the growth of fungal spores.

Considering the condition of the patient and his multiple infections with different organisms, He was put in quarantine area and his previous immunosuppressive therapy was withheld. He was treated extensively with Oral Ivermectin 6 mg given once daily and Fluconazole 150 mg given on alternate days along with Intravenous Meropenem 1 gram given twice daily, Metronidazole 500 mg given thrice a day and Hydrocortisone 50 mg given four times a day. Additionally he was supported with multiple cycles of renal replacement therapy and Subcutaneous Erythropoietin Supplementation.

DISCUSSION

Immunosuppression therapy is like a double edged sword. Optimum Immunosuppressive therapy would be the one with right balance between opportunistic infections and graft rejection. But, the topic of optimum Immunosuppressive therapy is still a matter of ambiguity.

Here, we present a case of multiple opportunistic infections due to iatrogenic immunosuppression which further lead to graft failure. Also, the patient here was diabetic with long history of uncontrolled sugars. This could have probably added up to his infection risk.

This unusual case of multiple infections is a classical case of the different opportunistic infections that can occurs in a patient on therapeutic immunosuppression. Here three different organisms affect the patient in three different routes. While the parasitic nematode *S. stercoralis* invaded systemically, *E. coli* bacteremia affected the urinary tract and the fungal species lead to a dermal infection. Previous reports of morbidity and mortality due to these organisms individually in immunocompromised hosts have been published. This implies that a similar patient with multiple infections would be at many fold increased risk.

In this case, the patient was on long term immunosuppression therapy with prednisolone. After the initial diagnosis, the drug prednisolone was withdrawn. Instead he was maintained with hydrocortisone for optimum immunosuppression during the course of infection. Coming to the opportunistic infections, for the urinary tract bacteremia he was treated with meropenem and metronidazole based on the antibiotogram. Strongylodiasis was treated with oral ivermectin as per the standard guidelines based on previous case reports. The patient could tolerate the oral anthelmentic therapy and benefitted from the same. For this dermal infection, he was treated with long term antifungal therapy consisting of fluconazole given on alternate days. The patient also required supportive therapy in the form of dialysis for his diminished renal function.

The whole therapy was effective enough to treat his multiple infections without any further complications. This case is one of its kinds in terms of opportunistic infections and opens up further discussion in terms of managing multiple opportunistic infections.

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