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IMMUNOSUPPRESSIVE INDUCE FUNGAL INFECTION- A CASE DISCUSSION

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CASE
Mr.X, a 17 years old male with past history of 2 years of edema in lower limbs. On urinalysis he was diagnosed by idiopathic nephrotic syndrome. Presented to our outpatient nephrology department with high fever, cough, traces of blood in his sputum.Symptoms began one month prior to presentation. The time patient was admitted in our ward was already on medication of prednisolone (12mg/d) and tacrolimus (21mg/d). General Physical Examination: Height: 175cm, Weight: 120 kg, Temp: 39*C, R: 28/ min, P:108/ min,BP:125/70 mmHg,moist rale sound heard in bilateral lungs. Patient's mother and father are suffering diabetes which is controlled by medication. Patient undergoes several lab test, sputum culture and CT scan which reveals bilateral lung infection caused by aspergillus(species of fungus). Thus, after half a month of treatment his symptoms resolved and CT scan shows lung infection disappeared.

DISCUSSION

Idiopathic Nephrotic Syndrome is corticosteroid sensitive but sometimes it has high prevalence of relapses in those patients, we have to combine cytotoxin with steroids for further remission. However, the more immunosuppressive drugs are used the more is risk of infection. As the case reported above the patient suffered from MCD-IgAN got complete recovery due to consumption of full dose of steroids and immunosuppressive drugs, though there were subsequent relapses several times. Later it got complicated with pulmonary fungal infection due to regular consumption of drugs.

2 years ago patient suffered from edema in lower limbs, initial urinalysis: shows proteinuria -, Serology: Albumin-23.6g/l, undergoes renal biopsy shows MCD-IgAN.

Treatment prescribed: Prednisolone 50mg/d due to high dose it lead to liver dysfunction therefore the dose was reduced to 40mg/d and then it get complicated with moderate increase in serum creatinine. Then again the prednisolone dose was increased upto 48mg/d addition with low molecular weight heparin. One month later patient gradually tapered the steroid consumption himself. Then after one year again he got relapses and upper respiratory tract infection diagnosed with several other symptoms such as edema, cough and fever. Patient was prescribed with repeated prednisolone 80mg/d, antibiotic, tacrolimus (2mg/d). 2 weeks later he had complete recovery again. Further patient consume medicines regularly and gradually the dose reduced as directed by his physician,. One month ago, he presented with fever, cough, traces of blood in sputum at that time patient consume prednisolone 12mg/d and tacrolimus 21mg/d. Further patient was admitted in ward. Diagnosed with bilateral lung infection, initial treatment begins with Cephalosporin but symptoms did not alleviate, T-spot and PPD test remains negative.

Sputum culture reveals fungal infection by Aspergillus then further itraconazole was injected for half a month and symptoms seems to be disappeared.

Nephrotic Syndrome is one of those illness which occurs in bundle of symptoms effecting both children and adults in any age, specifically targeting kidney function. Nephrotic Syndrome is basically not a disease but describes a group of symptoms frequently occurs in certain kinds of kidney disease and damage the kidneys filtering system, the glomeruli. Its a kidney disorder that causes body to excrete too much protein in urine.

In nephrotic syndrome, the wall of the capillaries in kidney become "leaky", allowing enough protein to be lost through the urine therefore significant decrease in protein level in blood. Daily loss of protein in the urine of 3.5 grams or more which ultimately leads to hypoalbuminemia causing edema. As the rapid lose of immunoglobulins in the urine can increases the risk of certain kinds of infection.

The majority of children with nephrotic syndrome

respond to cortiosteroids. However about 70% of children experience a relapsing course with recurrent episodes of oedema and proteinuria. Cortiosteroid usage has reduced the mortality rate in childhood nephrotic syndrome to around 3% with infection remaining the most important cause of death. Prednisone is a corticosteroid medication(also referred as steroid). Prednisone has several immunosuppressive properties and has been considered as mainstay of INS treatment for years. It is been consider as initial drug of choice for decades.

Several other corticosteroids closely resemble to prednisone can also be preferred. These are methylprednisolone and prednisolone.

The original treatment schedules for childhood nephrotic syndrome were developed in an ad hoc manner. The optimal doses and durations of cortiosteriods therapy that are most beneficial and least harmful have not been clarified.

Increased use of antibiotics and immunosuppressive drugs such as cortiosteroids are major factors contributing to higher frequency of fungal infections. Antibiotics and immunosuppressive drugs, by disrupting normal bacterial colonization and suppressing the immune system, create an environment within the body in which fungi can thrive (Hsu 2011; Tani 2012). Fungal infections can range in severity from superficial to life threatening. For example, fungal infections can be also on the top layers of the skin which is readily treatable and have a relatively limited impact on quality of life. However, if a fungal infection enters systemic circulation, consequences can be deadly (Badiee 2011; Zuber 2001).

The side effect of many immunosuppressive drugs is immunodeficiency, because the majority of them act non-selectively resulting in increased susceptibility to infections and decreased cancer immunosurveillance. Infection may disseminate to other organs, including brain, skin and bone. There are also other side effects such as hypertension, dyslipidemia, hyperglycemia, peptic ulcers, Liver and kidney injury. The immunosuppressive drugs also interact with other medicines and affect their metabolism and action. Sometimes corticosteroids and immunosuppressive drugs can cause sodium retention through direct action on the kidney, in a manner analogous to the mineralocorticosteroid aldosterone. This can result in fluid retention and hypertension.

Therapeutically, the bulk of corticosteroid dose is given in the morning to mimic the body,s diurnal rhythm, if given at night, the feeling of being energized will interfere with sleep. Prolonged use of corticosteroid can cause cause obesity, growth retardation in children. Even it can lead to convulsions and psychiatric disturbances include depression, euphoria, insomnia, mood swings and personality changes. Psychotic behaviors also have been reported.

Corticosteroids should not be stopped suddenly after prolonged use as this can result in adrenal crisis because of the body,s inability to secrete enough cortisol to make up for the withdrawal. Nausea, vomiting, shock are reported side effects of adrenal crisis. Prolonged usage of drugs may leads to fungal infection. Fungal infections also called mycoses, are important causes of morbidity and mortality in humans. Over last few decades the advent of the human immunodeficiency virus (HIV) epidemic and the increasing use of immunosuppressive drugs for serious medical conditions have dramatically increased the number of persons who are severely immunocompromised.

Corticosteroids and immunosuppressive drugs are mandatory requirement during Idiopathic Nephrotic Syndrome. But long term consumption of immunosuppressive drugs can lead to infection.

How can we control infectious complication due to immunosuppressive drugs is a big challenge so far?

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