

## **Opportunistic Infection among HIV Patients**

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**Abstract:** AIDS is the disease caused by HIV. Enhanced obtainability and availability of ART (Anti-retroviral therapy) has basically enhanced the survival rate, by minimizing the frequency of opportunistic infection among people living with HIV/AIDS. Opportunistic infections are defined as infections that are more and more severe because of immune suppression in HIV infected patient and they are main clinical manifestation of HIV patient. Opportunistic infection increases the probability of death in HIV patient. It is a worldwide public health challenge in the lack of vaccine and curative therapy. Exposure of potential pathogens and virulence of the pathogen, degree of host immunity, use of antimicrobial prophylaxis, immune compromised diseases is the main factors responsible for opportunistic infection in patient with HIV. Most common opportunistic infections include oral candidiasis, tuberculosis, cryptococcal meningitis, cryptosporidiosis, pneumonia, herpes zoster, toxoplasmosis, chronic diarrhoea, sepsis, genital herpes, genital wart. Introduction of HAART has led to evidential reduction in AIDS linked morbidity and mortality. This review represent factors responsible for the development of opportunistic infection in the patient with HIV, various opportunistic infections, its diagnosis, symptoms, management and prevention.

**Key Words:** *Acquired immunodeficiency syndrome, Anti-retroviral, opportunistic infection, HIV*

## Introduction:

Acquired Immunodeficiency syndrome (AIDS) is the disease caused by HIV responsible over 2 million deaths per year among 33 million people infected. It is a serious global problem reported from more than 190 countries around the world. It is world's greatest severe public health and development contest. This disorder was first recognized in the United States in 1981 among homosexual men. In India, first case of HIV disease was documented in 1986. In India it is predicted that there are 4 million cases of HIV infection, the general agreement is that there are increasing localized epidemics. Increased obtainability and convenience of ART has basically enhanced the survival rate, by dropping the frequency of OI among people infected with HIV/AIDS [1].

Opportunistic infections are defined as infections that are more and more severe because of immune suppression in HIV infected patient and they are main clinical manifestation of HIV patient. Majority of opportunistic infections increase risk of death in HIV patient. Introduction of HAART has led to evidential reduction in AIDS linked morbidity and mortality when patient experiencing morbidity from disease caused by opportunistic infection may have disruption in ART causing much fast progression of HIV disease. 25% patients stop their first ART within first 8 month because of toxic effects, treatment failure and non-compliance. The relative frequencies of particular opportunistic infection may change in different countries and even in different areas within same country. Patient who develop adverse drug reactions to anti-retroviral therapy have greater chances of opportunistic infection [2]. Low CD4 count increases susceptibility to OIs. Participants with advanced WHO stages III and IV were four and three times more likely to develop OIs than those with a WHO stage of I [3].

Most common opportunistic infections are oral candidiasis, tuberculosis, cryptococcal meningitis, cryptosporidiosis, pneumonia, herpes zoster, toxoplasmosis, chronic diarrhea, sepsis, genital herpes, genital wart. This epidemic remains Worldwide public health challenge for 21 century in the lack of vaccine and curative therapy. [4]

## Factors responsible for development of risk of opportunistic infection in patient with HIV:

- Exposure of potential pathogens
- Virulence of the pathogen
- Degree of patient immunity
- Use of antimicrobial prophylaxis

Other factors such as patient with all other immune compromised state include:

- Malignancies
- Organ transplant
- Patient with steroid therapy
- Immunosuppressive therapy
- Diabetes mellitus

Three main reasons of opportunistic infection:

- 1) Most of the patients are insensible of their HIV infection.
- 2) Patients are sensible of their HIV infection, but do not take ART because of economic and Psycho social factors;
- 3) Patients are prescribed ART, but fail to attain adequate virologic and immunologic response because of factors related to adherence, unexplained biologic factors or pharmacokinetics. [2]

Patient's data require for the study includes following:

- ◆ Patient identification data
- ◆ Personal history
- ◆ Family history
- ◆ Risk factor details
- ◆ Anti-retroviral therapy history
- ◆ Laboratory investigation includes following:

Hemoglobin, total leukocyte count, differential leukocyte count, serum creatinin, erythrocytes sedimentation rate, serum bilirubin, blood urea, blood sugar, SGOT, SGPT, VDRL, HBsAg, Anti-HCV, sputum acid fast bacilli (AFB), CD4 count, CHEST X-ray, stool microscopy, CSF analysis, blood, sputum, urine cultures, tissue histology.

Most common opportunistic infections are:

- Extra pulmonary tuberculosis (TB)
- Pulmonary TB
- Oral candidiasis
- Herpes zoster
- Upper respiratory tract infection
- Herpes simplex
- Diarrhea
- Low respiratory tract infection
- Cryptococcal Meningitis

## Diagnosis and management

### ● Oral Candidiasis:

Diagnosis:

It was identified by clinical analysis accompanied by isolation of the yeasts from oropharyngeal or vaginal swabs. It is usually first indication of immune impairment starts with small white or yellow patches on the mouth cavity and on the tongue. It extends in oesophagus which resulting difficulty in swallowing.

Management:

- Scrub tongue and gums and then rinse mouth with mild salt solution / dilute mouth wash / lemon water.
- Eat soft food.
- Eat bland not spicy food.
- Use a straw for liquid and soups.
- Have cold foods, drinks or ice, to relieve discomfort.
- Go for medical treatment when symptoms doesn't respond to home-based management and develop difficulty in eating and swallowing.
- Client with oesophageal candidiasis (major OI) must be referred to the Nodal ART centre for treatment.

Prevention:

- Ensure for oral hygiene, nutritious diet and adequate rest.
- Avoid consumption of sweets, alcohol and smoking.

## ● **Tuberculosis:**

Diagnosis:

Screening was offered to the patients based on a TB screening algorithm for patients infected with HIV. Tuberculosis diagnostic algorithm was afterward used to evaluate patients having a positive TB screening response (i.e. patients who reported having at least one of the 3 screening symptoms of cough and fever of any duration or night sweats of  $\geq 3$  weeks in the preceding 4 weeks). There are three types of tuberculosis:

1. **Pulmonary TB** was defined as presence of cough with or without fever, night sweat, weight loss, or haemoptysis and Acid fast bacilli (AFB) in two or more sputum samples and/or chest X-ray features suggestive of tuberculosis.

Symptoms: Chronic cough, loss of weight, mild fever, sweating at night, pain in chest or upper back, loss of appetite.

2. **Extra-pulmonary TB** was defined as clinical indication suggestive of TB without features of pulmonary participation followed by histology of lymph node biopsy [for *TB lymphadenitis*], or followed by findings of exudative pleural effusion accompanied by clinical response to anti-tuberculosis drugs [for *pleural TB*], or followed by ultrasonography of the abdomen for evidence of lymph nodes accompanied by clinical effect to anti-tuberculosis drugs [for *abdominal TB*].

Symptoms: Lymph node swelling and fever, intestine pain in the abdomen, diarrhoea, liver jaundice, brain-meningitis with symptoms of confusion.

3. **Disseminated TB:** It was defined as clinical characteristics indicative of TB with concurrent including minimum of two non-contiguous organs, with positive sputum smear, histopathological, radiological evidence of TB. For patients with negative sputum AFB despite strongly suggestive clinical and/or radiological features and patients whose diagnosis of extra pulmonary TB was not based on definitive tests such as histology, further supportive laboratory evidence especially elevated erythrocyte sedimentation rate (ESR), followed by clinical effect to anti-tuberculosis drugs at least in the intensive phase of treatment was further required before diagnosis of TB was accepted. For any patient in this category whose anti-tuberculosis drug response was not ascertained, the diagnosis of TB was not upheld.

Management:

Anti-tuberculosis treatment usually for 6-8 months. Ensure client's adherence to both treatments.

Prevention:

- Seek early medical attention for cough of any duration.
- Cover mouth while coughing.
- Spit into a closed container containing disinfectant.
- Avoid unventilated space.
- Evaluate close contacts for TB.
- BCG vaccines for new-borns.

## ● **Cryptococcal meningitis**

**Diagnosis:** It was diagnosed based on clinical evidence of meningitis with demonstration of cryptococcal yeast cells in the cerebrospinal fluid by Indian ink staining.

It is caused by infective organisms which spread to the brain through blood. It is gently progressive and finally fatal, if left not treated. It produces headache which slowly rises over time and become continuous, stiff neck, double vision, fever, nausea, and vomiting, altered consciousness.

**Management:**

- Family members support to ensure patient's safety.
- Immediately refer to general OPD for treatment and support adherence to treatment.

### ● **Cryptosporidiosis:**

It is caused by micro-organisms that live in human intestine. It is highly infectious and transmitted through water, food, animal- to - human and human- to- human contact. It causes watery diarrhea and malabsorption.

**Management:**

- Drink more liquids than usual
- Continue to eat.
- Avoid self medications.
- Go for medical treatment if signs of dehydration appear. And diarrhoea does not reduce.

**Prevention:**

- Drink bottled/ boiled water/ Zeoline solution/ filtered water.
- Peel and thoroughly wash fruits and vegetables.
- Avoid direct contact with faeces.
- Wash hands properly with soap before eating.

### ● **Pneumonia:**

It was diagnosed as clinical evidence of pneumonia with supportive chest X-ray infiltrates and positive sputum bacteriological test.

**Symptoms:** Cough, fever, shortness of breath, chest pain, increased production of sputum.

**Seek medical treatment:**

- Sudden high fever with chills
- Severe chest pain or discomfort.
- Sputum colour changes to grey, yellow or green.
- Sputum has blood in it.

- Severe difficulty in breathing.

Management:

- Be active by walking about, turning in bed and sitting up.
- Regular massage or gentle pat on the back of the chest over the lungs.
- Cough and clear the lungs at least four times a day.
- Drink lots of water.
- Breathe steam.
- Apply home remedies for soothing the cough and breathing.
- Complete full course of treatment.

- **Herpes zoster:**

Diagnosis: It was diagnosed based on clinical evidence of prototypic painful skin eruptions with characteristic dermatomal distribution.

Painful rash with blisters on the face, scalp, neck, chest, back, stomach or limbs. It is caused by virus and develops if previously infected with chicken pox.

How rashes appear?

Rashes start with sharp, burning pain, tingling, numbness, itching or aching in or under the skin then grapes like clusters of small, clear, fluid-filled blisters on red skin appear. Healing takes various weeks and leaves discoloured areas.

Management of Herpes zoster

- Apply calamine lotion to intact blisters twice daily.
- Keep area dry and clean
- Avoid rubbing from clothes.
- Wear clean, loose fitting and cotton clothing,
- Bath sores with warm salt water thrice a day.
- Apply gentian violet solution or antibiotic skin creams or ointments once a day to broken blisters.
- Get medical treatment as soon as possible. Treatment reduces healing time and pain and delay or prevents additional outbreaks/ episodes.

- **Toxoplasmosis:**

Infection acquired by contact with cats or birds, eating undercooked meat. It affects brain and lymph nodes

Symptoms:

Fever, headache (severe and localized), confusion, vomiting, seizures, altered mental status, palsy and coma.

Treatment :

Ensure referral to Nodal ART centre for early diagnosis and treatment.

Prevention:

- Proper hand wash and cleaning of kitchen surfaces.
- Avoid handling cat feces or gardening without gloves.
- Eat completely cooked meats only.

### ● **Chronic diarrhea:**

Diagnosis:

It was initially diagnosed based on history and the responsible etiologic agent was then isolated by appropriate stool analysis. Investigate the duration, volume, frequency, consistency of stools as well as any history of abdominal pain, tenesmus, nausea, vomiting, and presence of constitutional symptoms such as fever. Though physical examination is necessary to find out the state of hydration and the status of HIV disease among other things.[5]

### **Conclusion/ Management:**

- ❖ There is a need of better accessibility of Anti-retroviral therapy center (ART).
- ❖ Optimal doctor patient ratio requires delivering quality of service. Effective counseling regarding disease, complications, treatment and its reactions.
- ❖ Awareness regarding opportunistic infection, regular follow up, compliance to therapy is very essential.
- ❖ Intervention program and services especially for rural and remote areas rather than urban areas.
- ❖ Special facilities to needy people to avoid late transfer of patients that leads to late diagnosis.
- ❖ Rehabilitation centers for disease people should recognize and encouraged in society. It increases survival rate and decrease morbidity and mortality of disease.
- ❖ Having skilled health professionals, and having equipped laboratory diagnostic setup are mandatory to be able to deal with specific diagnosis and management of OIs.
- ❖ Provide a conducive environment to express feelings and emotions.
- ❖ Educate about HIV/AIDS and OIs.
- ❖ Educate about importance, prevention and early recognition of OIs.
- ❖ Help the client to seek medical attention at the general OPD for symptoms indicative of OIs.
- ❖ Inform about available treatment and home remedies for symptoms associated with OIs.
- ❖ Link the client back to the Nodal ART centre, if required.
- ❖ Ensure drug adherence and counsel the patient on safe sex, condom usage, proper nutrition and positive living.



❖ Explain and emphasize appropriate behaviour and habits to contain infections.[6]

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