ABSTRACT

Introduction: Tuberculosis (TB) is very common in India, China and other developing countries. World Health Organisation (WHO) had estimated 9.2 million new cases of TB, worldwide in 2006 of which 7.7% were positive for Human Immunodeficiency Virus (HIV). In India, at the end of 2007, there were 2.5 million people living with HIV and AIDS (PLWHA) whereas incidence of TB was 1.8 million cases per year. Tuberculosis is the most common HIV related opportunistic infection in India and caring for patients with HIV/TB co-infection is a major public health challenge. The incidence of tuberculosis is more in people living with HIV infection. So, WHO has developed the strategy of treating HIV/TB co-infection irrespective of patient’s CD4 count. If any HIV positive patient is diagnosed to be infected with tuberculosis, the Antitubercular treatment (ATT) is started along with Antiretroviral therapy (ART).

Here, we report a case of skin ulcer due to Mycobacterium tuberculosis on chest, secondary to pulmonary tuberculosis in HIV infected person with varied presentation.

Material and Methods: At first pyogenic infection due to Methicillin Resistant Staphylococcus aureus (MRSA) was diagnosed. As the patient did not improve even after the full course of Linezolid therapy for Methicillin Resistant Staphylococcus aureus (MRSA) which was superadded infection, the discharge and also tissue material were collected from the base of ulcer and cultured on Lowenstein – Jensen media and Ziehl-Neelsen staining were done. The acid fast bacilli were present on staining and growth on Lowenstein - Jensen media was identified as Mycobacterium tuberculosis.

Outcome of study: As the patient was also HIV positive both ATT and ART was started. A significant improvement of the cutaneous lesion was noted after one month of treatment and patient was discharged after another fifteen days.

Conclusion: Tuberculosis is very common in India and sophisticated automated system for detecting M.tuberculosis is not available in all centers. Any non-healing ulcer not responding to routine antibiotics must be screened for tuberculosis in developing countries. If tuberculosis is detected, promptly HIV testing must be done so that treatment strategy can be finalised.

Word count - 341

KEY WORDS: HIV/TB co-infection, People living with HIV and AIDS (PLWHA), Skin tuberculosis
developing tuberculosis is estimated to be between 20-37 times greater in people living with HIV than among those without HIV infection[3]. Similarly, tuberculosis accelerates the progression of HIV infection to Acquired Immuno Deficiency Syndrome (AIDS) and shorten the survival of such patients. Of 1.8 million HIV related deaths in 2009, 22% were due to tuberculosis[4]. Even risk of drug resistant tuberculosis is higher amongst persons with HIV infection compared to others (HIV negative).

Tuberculosis skin ulcers are extremely unusual. Cutaneous tuberculosis is caused by Mycobacterium tuberculosis and rarely by Mycobacterium bovis. Even in India and China where tuberculosis is quite common, cutaneous tuberculosis cases are rare i.e. 0.1 to 2.5%[5]. Moreover, Seeman et al in 2008 have reported that cutaneous tuberculosis is still a difficult disease to diagnose[6].

Here, we present a case with ulcerative lesion on right side of chest. The patient was diagnosed as a case of cutaneous tuberculosis with HIV and was treated with proper antiretroviral therapy and antitubercular drugs.

**CASE STUDY**

**OBSERVATIONS AND RESULTS:**

A 38 years old man presented with multiple ulcers over right axilla extending to the right chest wall with purulent discharge, was admitted to our hospital. The patient gave the history of small swelling over right axilla, 6-8 months back which was gradually increasing in size and was painful. As the patient was an agricultural worker, the history of trauma or thorn prick was specifically asked to rule out any actinomycotic or fungal infection. The patient had history of persistent cough 3-4 months back. But there was no history of weight loss. Patient was treated by many doctors from time to time but patient did not respond. The swelling was around 4cm × 3cm and as it was on the lower part of right axilla, it was diagnosed as axillary abscess and incision and drainage was done two and half month back, in a private nursing home. The pus was not sent for any investigation and patient was treated with antibiotic. As patient was very anaemic, 2 bottles of blood transfusion was given in the nursing home. Then other axillary swelling developed and ulcerated within one and half month. Hence, multiple ulcers with purulent discharge developed extending from right axilla to right chest wall( Photo 1).

The investigations done in our hospital was:

- Fasting plasma glucose levels: 90 mg/dl, 
- Haemoglobin: 6.1 gm/dl, ESR: 138 mm in first hour, 
- Peripheral smear showed microcytic hypochromic anaemia, platelets were adequate and other parameters were in normal limits and X – ray chest: Lungs clear. 

Fine needle aspiration cytology (FNAC) from ulcerative lesion showed acute inflammatory cells. Gram’s staining of the pus showed plenty of Gram positive cocci arranged in clusters. On routine culture, Methicillin Resistant Staphylococcus aureus(MRSA) was isolated which was sensitive to Vancomycin and Linezolid and resistant to Penicillin, Erythromycin, Ciprofloxacin and Quinapristine, Dalfopristine. Methicillin resistance was detected using Cefoxitin (Cx 30μg) disk as per CLSI guideline[7]. The patient was treated with Linezolid but the ulcers were not healing.

Considering high ESR and as the ulcers were not healing, the discharge was collected from edge and base of the ulcer and Ziehl Neelsen staining with 20% H$_2$SO$_4$ was done. In the smear plenty of Acid fast bacilli (AFB) were present and some were beaded in appearance (Photo 2). On the same day, patient’s sputum sample were examined and it was negative for Acid fast bacilli. On next day morning, the induced sputum was collected and smear showed plenty of Acid fast bacilli (3+) and some were beaded in appearance (Photo 3).

As the patient was AFB positive, patient’s serum was tested for HIV antibody and the patient was found to be HIV positive as per NACO guidelines [8], though the patient did not give any relevant history.

The tissue collected from base of ulcer was homogenized and concentrated by Petroff’s method and the deposit was inoculated into two bottles of Lowenstein-Jensen media (L-J). Patient’s sputum was also inoculated into two
bottles of L-J media after Petroff’s method. The rough, tough and buff coloured colonies of M.tuberculosis appear on L-J slant on fourth week from sputum and from the tissue growth appeared on sixth week on L-J media (Photo 4). The AFB staining from the growth revealed plenty of Acid fast bacilli and the growth was niacin positive.

As the patient was HIV positive and sputum and exudate from ulcer was positive for Mycobacterium tuberculosis, Antiretroviral therapy (ART) and antitubercular drug regimen was also started on the same day.

The patient responded to the treatment very well and after three and half months came for follow up when skin ulcers healed completely.

**DISCUSSION :**
Cutaneous tuberculosis is also an ancient disease and were described long before Robert Koch identified Mycobacterium tuberculosis in 1882. Laennec in 1826 first gave the description of cutaneous tuberculosis on his own prosector’s wart which developed after an injury while performing autopsy on a patient with spinal tuberculosis[9]. In 1886, Reil and Paltauf established that the wart was a tubercular lesion[10]. The clinical varieties of cutaneous tuberculosis can be divided into three broad groups – a) patients who were not previously exposed to M.tuberculosis, b) patients who were previously sensitized and c) tuberculids that develops a hypersensitive response of a tuberculosis focus elsewhere in the body. As previously sensitized hosts are very common in developing countries like India, lupus vulgaris is the most common variety of cutaneous tuberculosis reported from India, followed by TB verrucosa cutis and scrofuloderma[5]. No systematic survey for prevalence of cutaneous tuberculosis has been carried out in India. In one of the study it was found that cutaneous tuberculosis was associated with tuberculosis in other organs in 22.1% patients and the other organ most commonly involved were lungs. Even in the present case, the patient was having tubercular ulcer along with involvement of lungs. Most studies also reported that male are most commonly affected. Cutaneous tuberculosis sometimes has very diverse clinical presentation. The initial presentation may resemble a common bacterial infection or the ulcerative lesion may have superadded bacterial infection [11, 12]. In our case, initially patient had superadded infection with Methicillin Resistant Staphylococcus aureus(MRSA). After taking full course of Linezolid, the ulcer remained as it is and that made us to think for doing acid fast staining from the discharge. In culture, the growth was identified as M.tuberculosis. Currently the cause of skin ulcers may be vascular ulcers, squamous cell carcinoma, rodent ulcers, tubercular ulcers etc [13]. The differential diagnosis of cutaneous tuberculosis also includes infections with Mycobacterium ulcerans and Mycobacterium marium, Cutaneous anthrax, Cutaneous leishmaniasis, Sporotrichosis, Cat scratch disease due to Bartonella henselae etc [14].

In our case, as the patient was suffering from tuberculosis and HIV seropositive, the patient was treated with ART and ATT. In 2009, out of 1.7 million people died from tuberculosis. 4,00,000(24%) were among people living with HIV. Tuberculosis is also one of the leading cause of morbidity and mortality among PLWHA. Hence, WHO implemented collaborative HIV / Tuberculosis activities to decrease the burden of HIV / Tuberculosis coinfection.

In patients with latent Tuberculosis infection, the risk of developing active diseases is several hundred folds higher among persons who acquire HIV. In 2007 it was reported from Brazil, 80% reduction in tuberculosis cases in HAART treated compared to ART naïve HIV infected person [15].

**CONCLUSION:**
It has been observed that HIV epidemic continues to fuel TB epidemics and each increasing the morbidity and mortality of the other. WHO recommends the implementation of the Three I’s for HIV / Tuberculosis co-infection to reduce the burden of Tuberculosis among people living with HIV[16]. The three I’s are – i) Intensive tuberculosis case finding, ii) Isoniazid preventive therapy and iii) Infection control for tuberculosis. There is strong evidence that Antiretro-viral
Therapy (ART) can lower a person’s viral load and restore the immune system and hence, significantly reduces HIV and Tuberculosis. WHO in 2011 recommends earlier ART at ≤350 CD4 count and immediate initiation of ART for all patients with HIV/TB co-infection irrespective of CD4 count[17]. Proper training and continuing medical education of health care workers is needed for early detection of cases with HIV/TB co-infection, so that WHO treatment strategies can be followed for a better outcome of the patient.

Hence to conclude, in India, China and other developing countries, any non-healing skin ulcer, not responding to routine antibiotics, must be screened for tuberculosis and if positive, the patient must be screened for HIV.

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FIGURES:

Figure 1: Superadded skin ulcer infection
Figure 1: Skin ulcer with superadded infection
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Non-healing skin ulcer in HIV/Tuberculosis co-infection: A case report.

Figure 1: Skin ulcer with superadded infection

Figure 2: Ulcer after treatment with Linezolid
Figure 2: Tubercular ulcer after treatment with Linezolide.
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Figure 3: Acid fast bacilli from base of the ulcer.

Figure 4: AFB from sputum
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Figure 5: Growth of M.tuberculosis on L-J media from tissue exudate
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