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Internal Medicine

BRUCELLOSIS WITH PULMONARY MANIFESTATION- AN ATYPICAL PRESENTATION

Dr. Priyankar Mandal*	PGY 3, DNB General Medicine, Department of Internal Medicine and Rheumatology , Apollo Multispeciality Hospital, Kolkata. *Corresponding Author
Dr. Jayanta Sharma	Senior Consultant, Department of Internal Medicine and Rheumatology, Apollo Multispeciality Hospital, Kolkata.
Dr. Meghna Dutta	Junior Consultant, Department of Internal Medicine and Rheumatology, Apollo Multispeciality Hospital, Kolkata.
Dr. Mayank Sahu	PGY 3, DNB General Medicine, Department of Internal Medicine and Rheumatology, Apollo Multispeciality Hospital, Kolkata.
Dr. Abhinandan Saha	PGY 2, DNB General Medicine, Department of Internal Medicine and Rheumatology , Apollo Multispeciality Hospital, Kolkata.
Dr. Soumyadeep Bhattacharjee	PGY 1 , DNB General Medicine, Department of Internal Medicine and Rheumatology, Apollo Multispeciality Hospital, Kolkata.

ABSTRACT Brucellosis is a zoonotic disease caused by the genus Brucella with multiple system involvement and thus is an important cause of pyrexia of unknown origin. Although, the disease can affect any organ system, involvement of respiratory system is quite rare. In this case report, we present a 37 years old previously healthy male; admitted with complaints of fever for 15 days associated with productive cough, generalized weakness, headache, body ache, back ache and mild intensity pain in knee and elbow. Common tropical infections were ruled out. As CT scan showed multifocal patches of consolidation, bronchoalveolar lavage analysis was done which was inconclusive. Fever of unknown aetiology is always a challenge to the physicians. In this case report, we emphasize that it's important not to blindly treat the common suspects without any evidence but to keep searching for the actual culprit.

KEYWORDS : Fever of Unknown Origin, Brucellosis, Infectious Disease.

INTRODUCTION-

Brucellosis is an important zoonotic infection caused by bacteria of the *Brucella* genus. In humans, the disease is primarily linked to four species - *B. abortus*, *B. melitensis*, *B. suis*, and, less commonly, *B. canis*. Transmission to humans usually occurs through ingestion of unpasteurized dairy products, direct contact of broken skin or mucous membranes with contaminated animal secretions such as milk, blood, or urine, or by inhalation of infectious aerosols in occupational settings.

Individuals at greatest risk include those in close contact with livestock or animal tissues, particularly farmers, veterinarians, abattoir workers, and laboratory personnel. The illness typically presents with nonspecific constitutional symptoms such as fever, night sweats, malaise, weight loss, and arthralgia. Because *Brucella* can invade multiple organ systems, clinical manifestations are remarkably varied. The musculoskeletal system is most frequently affected, leading to peripheral arthritis, sacroiliitis, or spondylitis. Genitourinary involvement may manifest as prostatitis, epididymo-orchitis, or pyelonephritis, while neurological complications include meningitis, encephalitis, or neuritis. Cardiovascular infection, though rare, can result in endocarditis or myocarditis.

Pulmonary involvement in brucellosis is uncommon but well-documented. Reported presentations range from bronchitis and interstitial or lobar pneumonia to pleural effusion, lung abscess, or solitary pulmonary nodules, occasionally accompanied by hilar or mediastinal lymphadenopathy. The respiratory form is thought to arise mainly from inhalation of contaminated aerosols or, less commonly, through hematogenous dissemination from systemic infection.

CASE PRESENTATION-

A 37-year-old previously healthy male, presented to Department of General Medicine, Apollo Multispeciality hospital with complain of fever and cough for 15 days. Fever was sudden in onset, non progressive, high grade with maximum recorded temperature of 104 °F, remittent in pattern, more at night and early morning, onset with chills and rigor and relieved with medicine. Fever was also associated with generalized weakness, headache, body ache, back ache and mild intensity pain in knee and elbow. Cough was associated with white, mucoid expectoration and exacerbated at night. Patient was a steel factory worker with occupational exposure to dust and no known allergic history. Patient left smoking 12 years ago and takes wine occasionally. Patient has no significant history of animal exposure.

On examination during presentation, patient was alert, conscious, cooperative. Pulse rate was 92/ minute, regular, normal volume, no radio-radial or radio- femoral delay, Blood pressure was 130/80 mm Hg, Respiratory rate was - 18/ min, regular, thoraco- abdominal in nature and SpO2 was 98% in room air. No pallor, icterus, cyanosis or oedema were present. Lymph nodes were not palpable. No rash, eschar or scar mark were present.

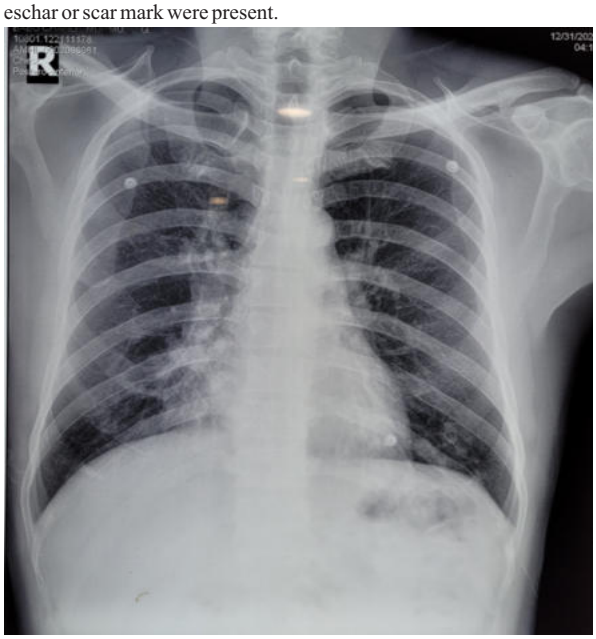

Fig:1 – Chest X ray - increased broncho-vascular markings and right hilar fullness.

Respiratory system examination was unremarkable with normal vesicular breath sounds bilaterally. Other systemic examinations also did not reveal any significant abnormal finding.Routine investigations showed leucocytosis, raised ESR and CRP, transaminitis, raised ferritin level. Routine investigations for endemic tropical infections were done. Malaria parasite was not found in peripheral smear and malaria parasite dual antigen were also negative for both Plasmodium vivax and Plasmodium falciparum. Dengue serology as well as scrub typhus IgM and Chikungunya IgM were negative . Widal test showed < 1:160 titre. COVID-19 RTPCR was negative. HIV ELISA also came negative. Skiagram of chest showed increased broncho vascular markings and right hilar fullness. (Fig. 1)

Detailed workup for fever of unknown aetiology was sent including brucella agglutination test. Contrast enhanced CT scan of thorax was done and it showed Multifocal patches of consolidations as well as scattered centri-lobular type nodules in both lungs –suggestive of infective changes with possible peribronchovascular spread. (Fig :2)

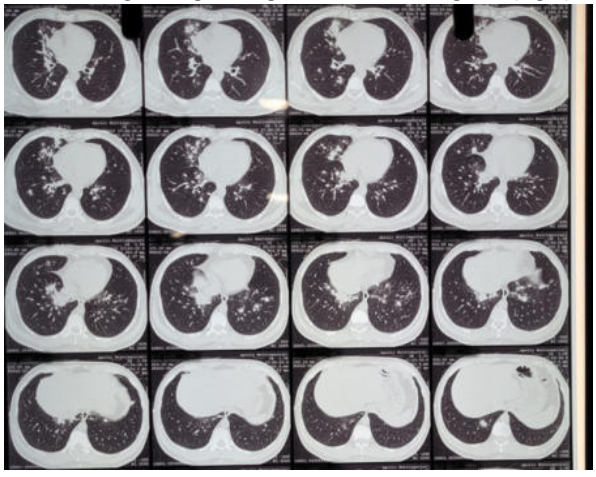

Fig: 2 – HRCT Chest- Multifocal patches of consolidations and scattered centri-lobular type nodules in both lungs.

Bronchoscopy was done showing normal study**.** Bronchoalveolar lavage was sent for analysis. Gram stain showed 40- 50 pus cells and no organisms, acid fast bacilli (AFB) was not found in Ziehl-Nielsen staining. AFB-BACTEC culture, AFB – GeneXpert both were negative. Fungal smear and beta galactomannan assay were both negative. Culture from BAL fluid was also unyielding. Serum Angiotensin-converting enzyme (ACE) level was mildly raised (43 mmol/mL/min) . In view of pulmonary symptoms with joint pain, Anti-nuclear antibody (ANA) by Hep 2 method was tested , which also came negative. Patient started responding well to doxycycline which along with the radiographic features suggested atypical bacterial pneumonia. Legionella antigen in urine was negative. Meanwhile, report for Brucella agglutination test by standard tube agglutination method came back which was reactive for both Brucella abortus and Brucella melitensis antibody in 1:160 titre.

Patient was started on Doxycycline and rifampicin for 6 weeks and dramatic improvement was seen . Fever subsided and improvement of all the clinical and laboratory parameters were seen.

He came to follow up in OPD after 2 weeks and was doing fine with no fever and cough.

DISCUSSION-

On retrospection, we took further history to know the risk factor of Brucellosis in our patient and we found that patient recently changed his source of dairy products. Diagnostic clue to difficult cases often can be found in meticulous history taking.

As mentioned before, human brucellosis can have vast array of presentations and thus requires high index of suspicion particularly among high risk population. Pulmonary involvement in brucellosis extremely rare and symptoms may be confused with other upper respiratory or lower respiratory diseases[1]. Pulmonary brucellosis can often be confused with Tuberculosis (TB) infection in TB endemic areas and subsequently mistreated[2]. Moving from empirical therapy to more focused organism specific therapy is of paramount importance in all infectious diseases.

Blood culture has traditionally been the mainstay of organism isolation in brucellosis, however limited in practical settings due to slow growing nature of brucella. However, culture gives the advantage of species identification, differentiation of wild and vaccine species of brucella and also provide antibiotic sensitivity profiling[3]. Blood culture can pick up early disease when serological tests may be negative or have low titre[4]. Various culture methods have been developed including automated methods to overcome the drawbacks of traditional blood culture. Recent development of matrix assisted laser desorption ionization – time of flight spectrometry (MALDI-TOF) technology allows to quick identification of isolates from solid or blood culture media at species level. But, the use of this is still limited due to highly expensive and therefore less available MALDI-TOF equipment[5].

As culturing brucella still remains difficult or expensive, other laboratory investigations, which include – serological diagnosis and nucleic acid amplification tests (NAAT) , remain clinically important. Among the various serological diagnostic methods, the Standard Tube Agglutination Test (SAT) developed by Wright et al. is the most popular. SAT is a quantitative test and can measure total quantity of IgG and IgM level. 0.005M 2 mercaptoethanol (2ME) is then added to the serum, which inactivates IgM agglutination[6] , and thus IgG level can be measured. Agglutination titre of 1:160 is taken as cut off when clinically compatible features are present. However, in endemic areas for Brucellosis, 1:320 titre is taken as cut off value.

CONCLUSION –

Pulmonary brucellosis is a very rare condition with overlapping features with pulmonary tuberculosis and sarcoidosis and thus may be underdiagnosed. A high index of suspicion along with careful history taking is required for correct diagnosis.

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