

**Original Research Article****Study of Incidence of Melioidosis for a period of two years in a Tertiary care Hospital in North Kerala, South India**

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Mob: 09686301345, Email: manasisarosh@yahoo.com**ABSTRACT**

Burkholderia pseudomallei is a saprophytic organism found in soil and water predominant in Southeast Asian countries, India and North Australia.

In India many cases have been reported in recent years. This study was undertaken to analyze the varied clinical presentation and increased incidence of melioidosis. We carried out a prospective study of two years from May 2015 to April 2017 and got three culture positive cases at a tertiary care hospital in North Kerala, South India.

Melioidosis being one of the most potent emerging infections in India high degree of suspicion must be maintained for prompt diagnosis and management. Clinical presentation of melioidosis varies from acute septicemia to chronic infections. Melioidosis is a 'great mimicker' of tuberculosis like infections and community acquired pneumonias

Microbiological culture remains the standard method for the diagnosis of melioidosis. Treatment is usually divided into two phases, intensive phase for 10-14 days and eradication phase for a minimum of 12- 24 weeks. No licensed vaccine is available for melioidosis.

The commonest risk factor in our study was diabetes mellitus. Fever was the most common presentation (100%) followed by abscesses (66.7%). Two of the patients got infected during their occupation so it makes it important to think melioidosis as an occupational infection.

It is found that there is an increase in incidence of melioidosis in India, as the rest of the world. Increase in diabetic patients is a major risk factor for the incidence and also increased awareness among clinicians and microbiologists have also resulted in better diagnosis and identification

Keywords: *Burkholderia pseudomallei*, melioidosis, incidence, risk factor.

Introduction

Burkholderia pseudomallei is a saprophytic organism found in soil and water predominant in Southeast Asian countries, India and North Australia.

It was previously classed as part of the *Pseudomonas* genus and until 1992 it was known as *Pseudomonas pseudomallei*. The name melioidosis is derived from the Greek 'melis' meaning a disease of asses (glanders) and 'eidos'

meaning resemblance. It is phylogenetically related closely to *Burkholderia mallei* which causes glanders. The disease was first described in human beings by Whitmore and Krishnaswami (1912) in Rangoon, Burma. Whitmore isolated the bacillus in the year 1913^{1,2}. It is known to cause opportunistic infections like Melioidosis, also known as Whitmore's disease or Vietnamese time bomb. It has an incubation period of 1 – 21 days³ with maximum latency of upto 62 years⁴ making it apt for the name Vietnamese time bomb. With multiorgan involvement and mimicry of tuberculosis and various other infections, *B. pseudomallei* is a remarkable imitator has been regularly missed or rejected as contaminant.

Melioidosis being one of the most potent emerging infections in India⁵ high degree of suspicion must be maintained for prompt diagnosis and management.

Clinical presentation of melioidosis varies from acute septicemia to chronic infections. Its most common presentation is community acquired pneumonia with fever, weight loss. Patients with diabetes mellitus, have high incidence of melioidosis^{6,7}. Other risk factors are thalassemia, renal diseases, chronic lung diseases, chronic alcoholism, occupational exposure to soil and surface water, elderly males >45 years, immunosuppressed states due to corticosteroid therapy⁸.

Materials and Methods

The study was done to know the incidence of melioidosis in patients admitted in Pariyaram Medical College, Pariyaram, Kerala from May 2015 when the first case of melioidosis was detected to April 2017. Three cases of melioidosis was reported in the last 2 years. These patients were studied with respect to age, gender, suspected risk factors and analyzed for its various clinical presentations, severity, culture sensitivity of the organism and outcome.

Results

- Three patients were diagnosed of melioidosis. All three patients were above 50 years of age. Two male patients were of age 60 and one female patient was 52.
- Average duration of illness was 37 days, lowest being 3weeks and the longest duration being 3months.
- The male patients were discharged after about a month of treatment, but the female patient succumbed to death during treatment which was 2 weeks after admission.
- All three patients had type2 diabetes mellitus. Along with DM one patient had renal failure and was on peritoneal dialysis. There were no other risk factors like- renal stones, cirrhosis liver, thalassemia or severe burns. Co-morbidities like HIV, internal malignancy, connective tissue disorder were not present in any patient.
- The most common symptom was fever which was how all three patients had presented with.
- Abscess was the second mostcommon symptom that the patients presented with. Two patients had liver and splenic abscess. Of which, one had a previous history of injury on chest area which was sustained by some wooden splinters when he went to the forest. Which later became an abscess on chest for which incision and drainage was done but remained non healing.
- The third patient was a chicken culler and he was misdiagnosed as tuberculosis when he presented with chronic cough and fever. But he defaulted the regimen after 5 months, again he presented with same symptoms was again started on ATT. He also had a non healing ulcer in the left gluteal region which gave out purulent discharge which turned out to be a sinus with 10cm extension subcutaneously.

- Culture of pus from sinus, pus from the abscesses in other patients grew *Burkholderia pseudomallei* but blood culture was negative from all patients.
- All our patients' culture reports showed sensitivity to Ceftazidime, meropenem, imipenem and resistant to aminoglycosides and colistin. Sensitivity was also observed for other antibiotics like ciprofloxacin, ampicillin + sulbactam, piperacillin + tazobactam, ceftriaxone.(table:1)
- Only one patient developed septic shock & expired. Both the other patients had good outcome and cured on further follow up.
- The patient who expired was 52 year old female, who had risk factors like diabetes mellitus, renal failure. The patient had been undergoing peritoneal dialysis and when she developed fever it was treated as exit site infection. The patient had developed septicemia died two weeks post admission.

Table 1: Antibiotic sensitivity pattern for 3 patients with melioidosis

Name	Ismail	Raveendran	Geetha
Age/Sex	60/M	60/M	52/F
Date Of Admission	11/05/15	20/05/16	16/12/16
ANTIBIOTIC SENSITIVITY: S, SENSITIVE; R, RESISTANT			
Ceftazidime	S	S	S
Ceftriaxone	S	S	S
Meropenem	-	S	S
Imipenem	-	S	S
Cotrimoxazole	S	S	S
Piperacillin-Tazobactam	S	S	S
Ciprofloxacin	S	S	S
Ampicillin-Sulbactam	-	S	S
Tobramycin	-	S	S
Gentamycin	R	R	R
Colistin	R	R	R
Polimyxin- B	R	R	R

Discussion

Melioidosis being one of the most potent emerging infections in India⁵ high degree of suspicion must be maintained for prompt diagnosis and management. Clinical presentation of melioidosis varies from acute septicemia to chronic infections. As in other studies men were more predominantly affected, perhaps their greater exposure to soil and water⁹. Our study group of affected patients belonged to a particular age group of above 50 years, unlike other studies which showed no specific age group for the affected^{9,10}. All the patients had diabetes mellitus, showing the importance of increasing incidence of melioidosis due to increase in diabetic patients in India. The disease has been shown to mimic tuberculosis⁹. Male gender, age more than 45 years and diabetes mellitus are the individual risk factors for melioidosis¹¹. The commonest risk factor in our study was diabetes 100% for melioidosis. The predisposition to melioidosis in individuals with diabetes appears to be related primarily to impaired neutrophil function such as mobilisation, delivery, adherence and ingestion⁹.

Fever was the most common clinical presentation (100%), which is in accordance with earlier studies. Abscess was the second common clinical presentation (66.7%). Two patients (66.7%) presented with abscess along with fever. The wide diversity of local syndromes in our series such as pneumonia and focal abscess is well known in melioidosis. But none of the patient had parotid, prostatic, scrotal abscess and joint involvement like septic arthritis.

Despite disseminated disease in all our patients, 66.6% of our patients were treated successfully, in contrast to other studies which reported high mortality^{12,11}. A high index of suspicion for the infection, starting ceftazidime early in illness, good supportive care and prolonging the consolidation phase all these may have contributed to the good outcome.

Melioidosis could also be considered an occupational infection. One of our patients is a chicken culler, who had a non-healing recurrent

ulcer on the hip. The recurrent non-healing ulcer on the gluteal region could be attributed to local inoculation of the organism from the poultry either from his soiled hands with bird secretions or by inoculation from the chicken itself during culling and peeling. Inoculation is considered as the major mode of infection¹⁴. Considering inoculation as mode of infection, lung pathology in the patient might be attributed to hematological spread from the local non-healing lesion. Inhalation of aerosolized secretions from the chicken may also be considered as mode of infection for melioidosis^{8,15}. Domestic birds grown in captivity and exotic birds are found to be carriers of this bacterium; their high body temperature of more than 40⁰C is conducive for survival of *B. pseudomallei*¹⁶.

The second patient who had injured his chest with wooden splinters when he had gone to the forest for some medicinal plants as he specialises in natural remedies. *Burkholderia pseudomallei* being a saprophyte would have entered through the injury and created a non healing abscess which also resulted in the hematological spread to produce liver and splenic abscesses.

The increased incidence of melioidosis may be due to considering the diagnosis in all patients with pyrexia of unknown origin. Also an increase in diabetes in our country may also have lead to the increased in incidence. An increased awareness among clinicians and microbiologists and routine speciation of all non fermenters have also resulted in better identification, rather than a truly increasing incidence of the disease.

Conclusion

India is highly endemic in case of melioidosis and is now recognized as an emerging infectious disease in India⁵. In any case presenting as pyrexia of unknown origin and with multisystem involvement, melioidosis should also be considered in differential diagnosis. Melioidosis being a 'great mimicker' of tuberculosis like infections and community acquired pneumonias¹⁷

chances to miss a case is high. The need of the hour is to have effective laboratory facilities to avoid misdiagnosis/missing of a case of melioidosis. Automated culture system being the future in identification of organisms inclusion of *B. pseudomallei* in its database is an requisite in India and other endemic areas.

CDC has identified Melioidosis as an occupational hazard among laboratory research workers¹⁸. This study also emphasizes the need to consider Melioidosis as an occupational disease among the agricultural and poultry workers and the need for extensive research to bring out the disease burden in the community.

Animals and birds harbour many obscure pathogens which when released into the environment can cause threat to mankind. Recent mass culling of ducks and other domestic birds that occurred in Alappuzha for source reduction in suspected H1N1 might be counted as such an event (with risk of release of such organisms). Aerosolised secretions from domesticated birds in close contact with soil and water is deadly combination for increasing incidence of melioidosis. Before undertaking any measures of prevention, all possible pros and cons need to be evaluated. It should be borne in mind that the measures for prevention of one illness may be paving way for up rise of another equally or more deadly illness into the community leading to an outbreak.

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