SHORT COMMUNICATION

BURKHOLDERIA PSEUDOMALLEI AS THE PREDOMINANT CAUSE OF SPLENIC ABSCESS IN KAPIT, SARAWAK, MALAYSIAN BORNEO

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Background: Splenic abscess is an uncommon condition, with autopsy studies estimating an incidence rate of 0.14–0.70%. Causative organisms can be extremely diverse. *Burkholderia pseudomallei* is the most common cause of splenic abscess in melioidosis-endemic areas. **Methods:** We reviewed 39 cases of splenic abscesses in a district hospital in Kapit, Sarawak, from January 2017 to December 2018. The demographics, clinical characteristics, underlying diseases, causative organisms, therapeutic methods, and mortality rates were investigated. **Results:** There were 21 males and 18 females (mean age, 33.7±2.7 years). Almost all patients (97.4%) had a history of pyrexia. Diabetes mellitus was present in 8 patients (20.5%). Splenic abscesses were diagnosed using ultrasonography and were multiple in all 39 cases. Positive blood cultures were obtained in 20 patients (51.3%), and all yielded *B. pseudomallei*. Melioidosis serology was positive in 9 of 19 patients (47.4%) with negative blood cultures. All patients were treated for melioidosis with antibiotics without the need for surgical intervention. All splenic abscesses resolved after anti-melioidosis treatment was completed. One patient died (2.6%) as a result of *B. pseudomallei* septicaemia with multiorgan failure. **Conclusion:** Ultrasonography is a valuable tool for diagnosing splenic abscesses in resource-limited settings. *B. pseudomallei* was the most common etiological agent of splenic abscesses in our study.

Keywords: Splenic abscess; Melioidosis; Burkholderia pseudomallei; Ultrasonography

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INTRODUCTION

Splenic abscess is an uncommon condition, occurring at a rate of 0.14–0.70% in several autopsy series.[1] Although splenic abscess is uncommon, it is associated with a high mortality rate if diagnosis and treatment are delayed. A splenic abscess can be diagnosed using a combination of clinical features and imaging with ultrasonography or computed tomography.[2] Splenic abscess can develop as a result of hematogenous seeding, prior trauma, or other mechanisms. Risk factors for splenic abscess include endocarditis, splenic artery embolization, immunocompromised states and pancreatic disease.[3]

A variety of infectious agents, including bacteria, parasites, fungi, and mycobacteria, can cause splenic abscesses. The pathogens that cause a splenic abscess can vary greatly depending on geographic region and aetiology. Splenic abscess due to melioidosis, for example, is not uncommon in Thailand and Malaysia, where the disease is endemic.[4,5] *Burkholderia pseudomallei* was found to be the most common causative agent in a study of splenic abscesses in Thailand.[5] Gram-positive bacteria, Enterobacterales, and anaerobic bacteria, on the other hand, are responsible for a significant number of culture-positive infections in studies from Taiwan, India, and the United States.[3] We aimed to describe the demographics, clinical presentation, causative organism and therapeutic methods of the patient presented with a splenic abscess in Kapit Hospital, Sarawak, Malaysian Borneo.

MATERIAL AND METHODS

A single-centre retrospective review of all patients (over the age of 12) admitted to Kapit Hospital, Kapit, Sarawak, Malaysia, and diagnosed with splenic abscess between January 2017 and December 2018 was conducted. Due to the lack of computed tomography services at our centre, the diagnosis of splenic abscesses was established using abdominal ultrasonography. Splenic abscesses can be classified as solitary or multiple, with ultrasonography revealing ill-defined hypo- or anechoic lesions depending on the degree of proteinaceous fluid and necrosis. Debris, fluid levels, and varying thickness internal septations may also be seen.[6] Patients with a splenic abscess had their medical records reviewed for blood culture and serology results, as well as risk factors, clinical features, and treatment outcomes.

RESULTS

A total of 39 patients' medical records were reviewed. Twenty-one out of 39 patients were male (54%). The most common age group was <20 years old, and the frequency of splenic abscess decreased with increasing

age (Table- 1). The mean age of patients diagnosed with splenic abscess was 33.7±2.7 years old. In terms of ethnicity, the indigenous Iban ethnicity dominated (90%), with Indonesian and Malay accounting for the remaining 8% and 2%, respectively. The majority of the patients did not have risk factors. Only 8 of 39 patients (20.5%) were diabetic, while 7.7% had chronic kidney disease, 2.6% had human immunodeficiency virus, and none had a known malignancy (Table-2).

Table-1: Age group of patients with splenic abscess

Age group (years)	Frequency (Percentage)
<20	12 (30.8)
20–29	7 (17.9)
30–39	7 (17.9)
40–49	5 (12.8)
50–59	6 (15.4)
60–69	1 (2.6)
70–79	1 (2.6)

Table-2: Risk factors and clinical features of patients with splenic abscess

Risk factor	
Diabetes mellitus	8 (20.5%)
Chronic kidney disease	3 (7.7%)
Human immunodeficiency virus	1 (2.6%)
Known malignancy	0 (0%)
Clinical features	
History of pyrexia	38 (97.4%)
Abdominal pain	2 (5%)
High white cell count (>10 x 10^9/L)	15 (38.5%)

In 39 patients with splenic abscesses, blood cultures were positive in 20 (51%), with all of them positive for *Burkholderia pseudomallei*. *B. pseudomallei* serology was performed on 19 patients with splenic abscess and negative blood culture, and it was positive in 9 (47%) of them. A positive serology test for *B. pseudomallei* was defined as an antibody titre of ≥1:320 by the ELISA method. Because melioidosis is endemic in Kapit, Sarawak, all 39 patients were treated with antibiotics according to local guidelines. None of the patients required surgical intervention such as drainage or splenectomy. One patient (2.6%) died as a result of fulminant bacteremic melioidosis with multiorgan failure.

DISCUSSION

All 39 cases studied had multiple splenic abscesses diagnosed on ultrasonography. The extra-splenic abscess was discovered in 4 out of 39 patients: liver abscess (1 patient), and eyelid abscess (3 patients) (previously published).[7] All 4 patients had blood culture positive for *B. pseudomallei.* Internal organ abscesses are a common clinical manifestation of melioidosis. In the Darwin prospective study, splenic abscesses (5%) were the second most common type of internal organ abscess after prostatic abscesses (20%).[8] In contrast to the Thai studies, splenic and liver abscesses predominated, as did our findings.[9] The majority of studies demonstrated that splenic abscesses usually responded to prolonged antibiotic therapy.[8,9]

In our study, 51% of patients with splenic abscesses had *B. pseudomallei* bacteremia. The culture of *B. pseudomallei* from any specimen remains the gold standard for the diagnosis of melioidosis. One of the challenges in diagnosing melioidosis is that blood cultures are only positive in about half of all melioidosis patients.[10] Clinicians should remember that a negative culture does not rule out melioidosis.

Melioidosis was found to be the most common aetiology in children with splenic abscesses in a study conducted by Mohan *et al*. in Bintulu, Sarawak, Malaysia. Melioidosis was microbiologically confirmed by culture in 9 (17%) of 53 children with liver and/or splenic abscesses.[11] This finding was consistent with our study, which highlighted the importance of abdominal ultrasonography in the diagnosis of melioidosis. Furthermore, ultrasound is useful in diagnosing and monitoring melioidosis-related complications such as ruptured abscess and splenic vein thrombosis.[12,13]

Khiangte *et al*. found that the spleen is the most common solid visceral organ involved in patients with culture-proven melioidosis, followed by the liver. The spleen was the most common organ to develop abscess foci in disseminated disease. In that study, no splenic involvement was found in isolation, in contrast to ours, where the majority of splenic abscesses occurred in isolation (only 1 with concomitant liver and splenic abscesses).[14] Huson *et al*. demonstrated that internal organ abscesses had a high positive predictive value for melioidosis (93%), and the absence of abscesses did not rule out melioidosis. As a result, in endemic areas, ultrasound should be performed to determine the presence of abscesses, which will support empirical antibiotic therapy for melioidosis even in the absence of culture confirmation.[15]

CONCLUSION

Ultrasonography is an important diagnostic tool for splenic abscess in resource-limited settings. In our study, *B. pseudomallei* was the most common etiological agent of splenic abscesses. Antibiotic therapy alone would be sufficient in the treatment of melioidosis with splenic abscesses.

Conflict of Interest: None declared.

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