CASE REPORT

A Case of Severe Falciparum Malaria in a Returned Traveler

Low QJ, Lau WK, Lim TH, Lee RA, Cheo SW

Low QJ, Lau WK, Lim TH, et al. A Case of Severe Falciparum Malaria in a Returned Traveler . *Malays Fam Physician.* 2020;15(3);86–89.

Keywords:
Cerebral malaria, fever, plasmodium falciparum, traveler

Authors:

Low Qin Jian
(Corresponding author)
MD (UMS), MRCP (UK)
Department of Internal Medicine, Hospital Sultanah Nora Ismail, Jalan Korma, Taman Soga, 83000, Batu Pahat, Johor, Malaysia
Email : lowqinjian@moh,gov.my

Lau Wai Kar
MBBS (UTAR)
Department of Internal Medicine, Hospital Sultanah Nora Ismail, Jalan Korma, Taman Soga, 83000, Batu Pahat, Johor, Malaysia

Lim Tzyy Huei
MD (I.M. Sechenov Moscow Medical Academy), MRCP (UK)
Department of Internal Medicine, Hospital Sultanah Nora Ismail, Jalan Korma, Taman Soga, 83000, Batu Pahat, Johor, Malaysia

Lee Ri An
MBBS (UM), M.Med (Rad), FRCR (UK)
Department of Radiology, Hospital Sultanah Nora Ismail, Jalan Korma, Taman Soga, 83000, Batu Pahat, Johor, Malaysia

Cheo Seng Wee
MD (UMS), MRCP (UK)
Department of Internal Medicine, Hospital Lahad Datu, Peti Bersurat 60065, 91110, Lahad Datu, Sabah Malaysia

Abstract

Primary care providers should be alert to travel-related infections. Around 10-40% of returning travelers from all destinations and 15-70% of travelers from tropical settings experience ill health, either overseas or upon returning home.[1] A systematic approach concentrating on possible infections should be undertaken based on the patient's travel location, immunization history, presence of malaria chemoprophylaxis at the destination, other potential exposures, incubation period, and clinical presentation.[2-3] The World Health Organization (WHO) website is constantly being updated on specific travel-related infections and recent geographical outbreaks. In this paper, we report a case of severe falciparum malaria in a returned traveler.

Introduction

Traveling overseas is much easier and more affordable today than it once was with the rise of budget airlines across the world. An estimated 11.9 million international outbound trips from Malaysia were recorded in 2016, and that number is predicted to grow by an average of 3.5% annually to around 14.1 million trips by 2021.[1] This statistic ranked Malaysia as the sixth highest among emerging markets. Of course, the rise of international travel has also brought a rise in travel-related infections. Fever is a common presentation of infection, with gastrointestinal and respiratory symptoms being the most prevalent. Common travel-related infections include malaria, dengue, mononucleosis, *Rickettsia* infection, typhoid, paratyphoid, human immunodeficiency virus, hepatitis A, yellow fever, rabies, and many more. An initial evaluation of these travelers should employ a methodical approach to determine whether travelers pose any public health risks, which often have been listed as notifiable diseases by the World Health Organization.

Case presentation

A 33-year-old male engineer with no known medical history presented with a high fever for three days and reduced consciousness on the day of admission. He arrived in Malaysia two days ago from Sudan, South Africa for a one-week business trip. Upon arrival at our hospital, his Glasgow Coma Scale (GCS) score was E4V4M5 but dropped to E2V1M1 on the second day after his admission, thus requiring mechanical ventilation. He was hemodynamically stable but was persistently febrile. Systemic reviews and physical examinations revealed nothing remarkable. Brain computed tomography showed preserved grey white matter differentiations with no effacement of cerebral sulci (Figure 1, Panels A & B). A travel checklist was performed, revealing that he had failed to take his malaria chemoprophylaxis and had not complied with the WHO's pre-travel vaccination recommendations. His malaria blood film taken on the day of admission confirmed the presence of plasmodium falciparum (Figure 1, Panels C & D). He was treated for severe cerebral malaria (displaying reduced consciousness) with an intravenous artesunate dosage of 240 mg (2.4 mg/kg) stat at 0 hours, 12 hours, and 24 hours. The patient was subsequently given this dosage once daily for 1 week (switched to oral artemether/lumefantrine (Riamet) after he was able to tolerate oral medication. Next, he completed a minimum of 3 doses of IV artesunate: 100 mg oral doxycycline twice daily for 7 days and 30 mg oral primaquine once daily for 14 days. There was no renal impairment, hypoglycemia, acidosis, hemorrhage, shock, or pulmonary edema upon admission (Table 1). The patient subsequently developed acute kidney injury on Day 5, which resolved with supportive measures by Day 10 (Table 1). His raised transaminitis resolved by Day 14. Lumbar puncture was performed to rule out bacterial meningitis, and his cerebrospinal fluid results were normal. He made an uneventful recovery and was discharged on Day 10 of admission.

Table 1: Laboratory investigations

	Normal range	Day 1	Day 2	Day 5	Day 10
Full blood count					
Hemoglobin	13.0-17.0 g/L	13.8	12.6	10.0	9.3
Hematocrit	39.0-52.0 %	36.7	35.2	28.6	29.5
White blood cell	4.0-11.0, 10^9 g/L	7.3	8.2	4.5	11.8
Platelet	150.0-400.0, 10^9 g/L	167.0	130.0	202.0	561.0
Renal Profile					
Urea	2.8-7.0 mmol/L	4.3	7.3	17.4	9.2
Sodium	136.0-146.0 mmol/L	132.0	136.0	145.0	134.0
Potassium	3.5-5.0 mmol/L	3.0	3.6	4.3	3.8
Creatinine	59.0-104.0 mmol/L	85.0	75.0	145.	64.0
Liver Function Test					
Total Protein	66.0-83.0 g/L	75.0	67.0	60.0	84.0
Albumin	35.0-52.0 g/L	33.0	27.0	23.0	34.0
Globulin	28.0-36.0 g/L	42.0	40.0	38.0	50.0
Total bilirubin	5.0-21.0 µmol/L	18.7	11.9	5.3	15.4
Alanine transaminase	<50.0 U/L	48.0	28.0	13.0	115.0
Aspartate transaminase	< 50.0 U/L	50.0	24.0	20.0	43.0
Alkaline phosphatase	30.0-120.0 U/L	59.0	39.0	36.0	183.0
Creatinine kinase	22.0-198.0 U/L		222.0	201.0	
Lactate dehydrogenase	140.0-280.0 U/L		326.0	301.0	
Erythrocyte sedimentation rate	mm/hour		35.0		
C-reactive protein	< 3.0 mg/L		114.7		41.2
Serum lactate	0.5-1.0 mmol/L		1.4		
Blood & urine culture		Negative			
CSF Investigation: Cell count Biochemistry Culture & sensitivity Gram stain Acid fast bacilli		CSF pressure: 5 cmH20 (normal), clear appearance; no red blood cells; < 2 white blood cells seen CSF/Serum glucose ratio: 90% (normal) CSF protein: 0.3 mmol/L (normal) No growth Negative No acid-fast bacilli seen			

Table 2: Parasite count on admission and after initiating treatment

Day of admission	Day 1	Day 2	Day 3	Day 4	Day 5	Day 6	Day 7	Day 8
Parasite count (/µL)	36000	2739	684	377	176	0	0	0

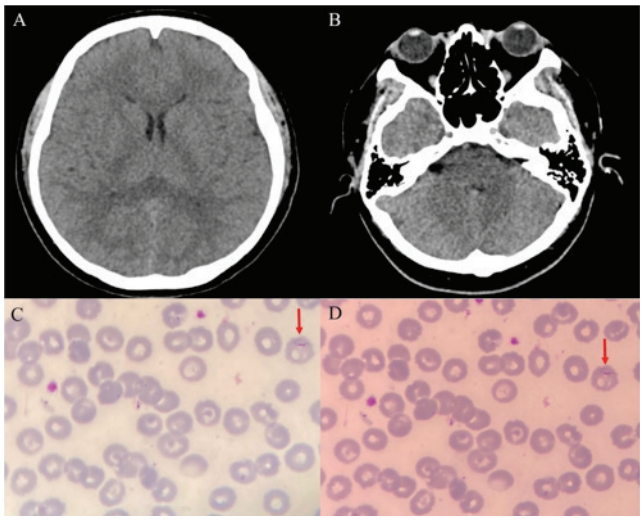

Figure 1
Panel A & B: Brain computed tomography showed preserved grey–white matter differentiations with no effacement of the cerebral sulci and no evidence of white matter edema or hydrocephalus.
Panel C & D: Blood film for malaria parasite (thin film) confirmed the presence of *Plasmodium falciparum* rings (red arrows) in the erythrocytes. A low magnification (10× or 20× objective lens) was used.

Discussion

A detailed travel history and checklist to identify potential risks should be performed in all returned travelers presenting with fever. An early assessment should occur to determine the need for isolation to lower the risk of transmission. Some common travel-related illnesses include malaria, dengue, mononucleosis, enteric fever, and *Rickettsia* infection. Conditions for which immunizations were available, such as enteric fever, hepatitis A, and influenza, were identified in a minority of cases. A travel checklist (Table 3) would be helpful in curtailing such diagnoses.

Table 3: Travel Checklist [6,7,8,9]

Travel Location (Geographical location):
Travel Dates (Departure, return dates):
General medical history: Past medical history: Pre-travel immunization9: hepatitis A, typhoid, influenza
Reasons for traveling, type of transportation, nature of accommodation:
Area visited & activities involved:
High-risk exposures or activities (e.g., insect bites, unclean water and food source, exposure to animal, sexual contact):
Malaria chemoprophylaxis (drug, doses, duration of therapy) (for tourists visiting malaria-endemic regions):
Contact with or personal history of illness:

Malaria is a global tropical vector-borne disease which is transmitted through a bite from a female Anopheles mosquito. This condition is annually responsible for around 3 million deaths worldwide.[4] Malaria in humans is commonly caused by *Plasmodium falciparum, P. vivax, P. malariae, P. knowlesi,* or *P. ovale*. Malaria is commonly diagnosed in febrile returned travelers, accounting for 5–29% of all such individuals presenting symptoms at specialist clinics and 26–75% of all patients hospitalized with a systemic febrile illness.[5] Patients can present with fever, malaise, nausea, vomiting, abdominal pain, diarrhea, myalgia, and anemia. Plasmodium falciparum is a life-threatening infection that accounts for 25–55% of deaths in febrile returned travelers.[5] Malaria is diagnosed by identifying plasmodium parasites in blood smears. Severe malaria could lead to death upon presentation, so early assessment and prompt anti-malarial therapy is essential. Supportive care is critical to manage complications associated with the organ failure seen in severe malaria.

Conclusion

Primary health care providers should employ a systematic approach in handling returned travelers presenting with fever. A thorough history should be taken, and a physical examination and clinical and epidemiological risk assessments should be performed to identify potential life-threatening infections. Namely, malaria and other emerging infectious diseases should be excluded.

Acknowledgement

The authors would like to thank the Director General of Health Malaysia for his permission to publish this article.

Conflict of interest and funding

The authors declare that they have no competing interests in the publication of this paper. The authors received no financial support for research, authorship, or publication of this article.

Informed consent

Written informed consent for this paper (including images, case history, and data) were obtained from the patient for the publication of this paper, including accompanying figures.

References

1. Bruni M., Steffen R. Impact of travel related health impairments. *J Travel Med*. 1997;4:61-4. doi: 10.1111/j.1708-8305.1997.

2. Thwaites GE, Day NP. Approach to fever in the returning traveler. *N Engl J Med*. 2017;376:548.

3. Felicia A Scaggs Huang, Elizabeth Schlaudecker. Fever in the returning traveler. *Infect Dis Clin North Am*. 2018;32:163.

4. World Health Organization. Malaria. Available at www.who.int/mediacen tre/factsheets/fs094/en/print.html. Accessed February 9, 2007.

5. Leder K, Torresi J, Libman MD, Cramer JP, et al. GeoSentinel surveillance of illness in returned travelers, 2007-201. *Ann Intern Med*. 2013;158:456–68.

6. Leggat PA. Assessment of febrile illness in the returned traveler. *Austr Fam Med*. 2007;36(5).

7. Thwaites GE, Day NP. Approach to fever in the returning traveler. *N Engl J Med*. 2017;376:548.

8. World Health Organization. International Travel and Health: Vaccination Requirements and Health Advice, Geneva. World Health Organization. Updated and published annually.

9. Wilson ME. *A World Guide to Infections: Diseases, Distribution, Diagnosis*. New York: Oxford University Press, 1991.