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Mixed Infection of Vivax and Falciparum Malaria with Severe Manifestations of Malaria at the General Hospital of the Christian University of Indonesia: A Case Report

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Abstract

Malaria is still a health problem in Indonesia. The number of malaria cases according to the 2018 RISKESDAS reached 8076 cases, and the highest number was obtained from Papua province with 3,334 cases. Multiple infection malaria in Indonesia according to RISKESDAS 2018, has a rate of 0.01% of the total cases, namely Plasmodium Falciparum malaria and Plasmodium non Falciparum malaria. A 47 year old man was referred from the clinic with complaints of high fever preceded by chills 10 days before being admitted to the hospital. Accompanied by shortness of breath, unable to get off the treatment bed due to feeling very weak, nauseous, sick and having a bulging stomach. Physical examination revealed a pale conjunctiva, ronkhi in the lower field of the right lung, dim percussion in the basal of the left lung, hepatomegaly, splenomegaly, shifting dullness. ring form vivax, on chest X-ray found a left pleural effusion. It is known that the patient previously lived in Papua from September 2018 to May 2019. During treatment, the patient was given artesunate injection therapy, dihydroartemisin + piperaquine and primaquin for seven days of treatment. At the end of the treatment, another chest X-ray was performed and re-examination of the peripheral blood smear, no more pleural effusions were found and no parasites were found on re-examination of the peripheral blood smear. Mixed infection of vivax and falciparum malaria, is a rare case that may occur in endemic areas where both plasmodium can be found. The prevalence in Indonesia according to RISKESDAS is only about 0.01% of all malaria cases in Indonesia.

Key words: Mixed Malaria, Severe Malaria, General Hospital

Introduction

Malaria is still one of the health problems in Indonesia. The number of malaria cases according to RISKESDAS 2018 reached 8076 cases, and the highest number obtained from papua province as many as 3,334 cases (Ministry of Health, 2013). The number of malaria cases according to the Indonesian Health Profile 2017 from the Ministry of Health states, reaching 59.00 per 1000 inhabitants in Papua and 0.99 per 1000 inhabitants nationally. The population in Papua reaches 3,265,202 people with 192,648 people who are positive for malaria in Papua. Malaria infection doubles in Indonesia according to RISKESDAS 2018, has a figure of 0.01% of the total cases, namely malaria Plasmodium Falciparum and malaria Plasmodium non Falciparum (Ministry of Health, 2013).

Malaria is characterized by a pattern of intermittent fever, accompanied by symptoms such as chills, pallor, headache, no appetite, nausea, vomiting, muscle pain and weakness, to a form of

severe malaria characterized by impaired central nervous structure or bleeding (RI, 2017; Sudoyo et al., 2006). Malaria is caused by plasmodium infection and transmitted zoonotically through the bite of the Mosquito Anopheles Sp. To establish the diagnosis of malaria, microscopic blood preparation examination and rapid diagnostic test (RDT) is required. Severe malaria is a condition of life-threatening malaria characterized by ALI/ARDS, muscle weakness, seizures experienced twice in the last 24 hours, jaundice, presence of hemoglobinuria, decreased awareness with GCS (Glasgow Coma Scale) <11 (RI, 2017). This case report will present the double infection of P.falciparum and P.vivax with clinical manifestations of severe malaria in the form of acute lung injury.

Case Report

A 47 year old man was referred from the SOS Medika Clinic, Jakarta to the UKI Hospital with the main complaint of constant fever nine days before being admitted to the hospital.

Since June 2, 2019, the patient experienced a sudden high fever, accompanied by complaints of pain throughout the joints and chills and sweating profusely, these complaints were felt every day until the patient was hospitalized. Nausea, vomiting and heartburn were felt by the patient on the seventh day before being admitted to the hospital. Complaints of shortness of breath were felt since one day before being admitted to the hospital.

From the auto history, information was obtained that the patient had been working in Papua, Eastern Indonesia since September 2018 and had just returned to Jakarta two weeks before being admitted to the hospital. Before the patient worked in Papua, while in Papua and two weeks after returning from Papua, the patient did not take malaria prophylaxis.

The patient then came to UKI General Hospital on June 11, 2019, the course of the disease on the ninth day, the patient's blood pressure at the emergency room 130 / 80mmHg, pulse rate 88x per minute, respiratory rate 28x per minute, temperature 38.5C and oxygen saturation 93 %. The patient's complaints while in the ER are fever, shortness of breath that is not affected by a change in position, breath does not wheeze, no cough with phlegm and complains of pain in the gut, nausea and vomiting 1x contents of water and food, pain is also felt in the upper right abdomen and upper left stomach. Defecation and urination were not found abnormal, no appetite and looked lethargic. From the physical examination of the chest, there was dim percussion in the left lung, abdominal examination found 2-finger hepatomegaly under the arch of the ribs, flat surface, sharp edges, supple consistency, positive tenderness, Schuffner II splenomegaly, 110cm abdominal circumference, others within normal limits. Initial laboratory examination results from the SOS Medika International Clinic obtained the following results, Hemoglobin 10.7g/dL, Erythrocyte 3.620.000/uL, Leukocytes 5.160/uL, Hematocrit 31.1%, Platelets 79,000/uL, MCV 85.9 fl, MCH 29.6 pg, MCHC 34.4g/dL. The results of the leukocyte count were as follows, basophils 0.8%, eosinophils 0.4%, neutrophils 85.2%, lymphocytes 7.4%, monocytes 6.2%, SGOT 34 IU/L, SGPT 23 IU/L, Ureum 16mg/dL, creatinine 0.81mg/dL, urea-to-creatinine ratio 19.75, blood sugar check at 104mg/dL, sodium 133 mmol/L, potassium 3.2 mmol/L, Chloride 105 mmol/L, C reactive protein 82 mg/L, malaria blood smear obtained Ring form P .falciparum 244/200 WBC, Ring form P. vivax 208/200 WBC, Trophozoid P. falciparum 12/200 WBC, Trophozoid P.vivax 60/200 WBC. The malaria rapid test showed the following positive P. falciparum and positive P. vivax results. Total bilirubin 2.6 mg/dL, direct bilirubin 1.6 mg/dL, indirect bilirubin 1.0 mg/dL. Blood gas analysis obtained the following results, blood pH 7,473, PCO2 24.7mmHg, PO2 92.5mmHg, oxygen saturation 97.3%, Base excess -4.2 mmol/L, HCO3 18.3 mmol/L, TCO2 19.0 mmol/L,

oxygen concentration 8.2 Vol%, chest X-ray found minimal pleural effusion in syncytial hemithorax.

The clinical condition, physical examination, and laboratory findings of the patient support the criteria for the diagnosis of severe malaria, namely, respiratory distress and muscle weakness are found, the patient is treated with a specialist in internal medicine. The first treatment carried out in the ER at the first UKI Hospital was the management of maintenance fluid therapy with maintenance drops of asering crystalloids or about 1500cc per day, administration of 500mg paracetamol, administration of nasal oxygen cannula 3 liters per minute, measured oxygen saturation to 97% by pulse oxymetry. On the first day of treatment in the room, the patient still complained of tightness, heartburn and right upper abdominal pain. He could not eat because he felt nauseous every time he ate. Physical examination found Schuffner II hepatomegaly and splenomegaly, accompanied by shifting dullnes + ascites +. Patients were given 1000cc asering maintenance fluids per 24 hours, 3x500mg paracetamol administration, 2x30mg lansoprazole, 3x1C sucralfate syrup, Dihidroartemisin + piperaquine (Darplex®) 40mg 1x3 tablet for 3 days and Primaquin 40mg 1x1 for 14 days, and Artesunate injection with a dose of 2.4mg / KgBB / day or the equivalent dose of 210mg (with rounded doses) or three and a half ampoules of artesunate sodium dissolved with solvent, given at 00 hours of administration, 12 hours of administration, and 24 hours of administration on the first 1 day, given at 00, agreed at 14.00 WIB.

The second day of treatment, the patient still complained of upper right abdominal pain, nausea had decreased, shortness of breath was reduced, fever 39.6C, but the patient was still unable to eat due to nausea. Maintenance fluid therapy was still given, liquid milk diet, continued medication, administration of Darplex® second day 1x3 tablet, Primaquin 40mg 1x1 second day, artesunate 24 hour administration at 14.00 WIB on the second day, repeated blood gas analysis was performed, the results were obtained. pH 7,473, pCO2 24.7mmHg, pO2 92.5mmHg, O2 saturation 97.3%, BE -4.2mmol / L, HCO3 18.3mmol / L, TCO2 19.0mmol / L, O2 concentration 8.2 vol%, total bilirubin 2.6mg / dL, direct bilirubin 1.6mg / dL, and indirect bilirubin 1.0mg / dL .

The third day of treatment, nausea is still felt, upper right abdominal pain is reduced, eating is still not biased because it is still nauseous, there is no fever with an axillary temperature of 36.7C, shortness of breath is no longer felt, coughing cough is denied, maintenance fluid therapy is still continued, with a soft diet and not stimulating, giving Darplex® on the third day 1x3tablet, Primaquin 40mg 1x1 the third day, and artesunate injection of maintenance giving 210mg per day every 14.00 WIB, routine blood tests were carried out with the results of Hb 9.1g / dL, Leukocytes 4100 / uL, Ht 25.9% , Tr 100.000 / uL, blood sugar as 97mg / dL, it was decided to do a routine daily blood check. The fourth day of treatment, complaints of nausea are still felt, upper right abdominal pain is still felt, the patient is able to eat softly, the patient is no longer experiencing fever, the temperature is 36.3C, the patient feels shortness of breath a little, the saturation is measured without oxygen nasal cannula using pulse oxymetry 98 %, stable hemodynamics, discontinued Darplex® therapy, Primaquin continued with a dose of 40mg 1x1 the fourth day, artesunate injection 210mg intravenously given the fourth day, Hb 8.1g / dL, leukocytes 3800 / uL, Ht 25.1%, Platelets 132,000 / uL, blood sugar while 99mg / dL, therapy is added with Hemobion® tablets 3x1 capsules.

On the fifth day, the complaints of nausea were no longer felt, the upper right abdominal pain was reduced, the tightness was no longer felt, the hemodynamic was stable, without nasal cannula saturation measured 99% using pulse oxymetry 210mg artesunate injection therapy was continued

at 14.00 WIB on the last day, Primaquin 40mg tablets 1x1 the fifth day, Hemobion® 3x1 capsules. The results of routine blood tests were 7.9g / dL Hb, 3500 / uL Leukocytes, 25% Ht, 186,000 / uL platelets, 98mg / dL of blood sugar. The sixth day of treatment, complaints of nausea had greatly reduced, heartburn and upper right stomach pain were no longer felt, shortness of breath was no longer felt, hepatomegaly was felt 1 finger below the arch of the ribs, splenomegaly Schuffner I, X ray examination of the chest was obtained, heart results were obtained and lung within normal limits, routine blood results, Hb 9.4g / dL, leukocytes 4.200 / uL, Ht 25.7%, platelets 276,000 / uL, blood sugar at 87mg / dL. The therapy that was continued was Primaquin 40mg 1x1 sixth day, and Hemobion® 3x1 capsule.

The seventh day of treatment, complaints of breathlessness, nausea, vomiting and abdominal pain were no longer felt by the patient, oxygen saturation was measured at 99% without nasal cannula, and using pulse oximetry. Physical examination of the thoracic and abdomen within normal limits, with routine blood results as follows Hb 10g / dL, Leukocytes 5800 / uL, Ht 27.8%, platelets 363,000 / uL, blood sugar at 83mg / dL, examination of thick and thin blood smears, with the result that no plasmodium was found in various stages, the patient then went for outpatient treatment with Primaquin 40mg 1x1 tablet therapy continued until the fourteenth day.

Results and Discussion

Severe malaria according to the 2015 WHO criteria, is the discovery of asexual stage Plasmodium falciparum or Plasmodium vivax with one or more clinical manifestations, namely, decreased consciousness (GCS <11), muscle weakness, recurrent seizures of more than 2 episodes in 24 hours, respiratory distress, pulmonary edema (O2 saturation <92%, respiratory rate> 30x / minute), circulatory failure or shock, jaundice (bilirubin> 3mg / dL, parasite density> 100,000 in falciparum), hemoglobinuria, abnormal spontaneous bleeding (World Health Organization, 2015) . Respiratory disorders such as ARDS or ALI, are complications that often occur in the context of severe malaria infection, but rarely receive special attention. In particular, ARDS has been reported in 5% - 25% of adults with severe falciparum malaria and 1–10% of patients with severe P. vivax infection. The associated mortality rate can reach up to 20% in developed countries (Agarwal et al., 2007).

From the history, physical examination and analysis of blood gases, as well as thick and thin malaria blood smears, it was found that the patient had multiple infections with P. vivax and P. falciparum malaria with severe clinical manifestations. Characterized by the presence of respiratory distress, muscle weakness, and the discovery of the second asexual malaria stage of plasmodium. It is likely that the patient got the infection from Papua province, where the patient worked from September 2018 to May 2019.

In our case, the incidence of ARDS may reflect the presence of inflammatory cytokines in the absence of infected erythrocytes. Emerging evidence suggests that even after treatment, free parasitic antigens can persist, which can provide a stimulus for ongoing inflammation (Koh, 2014; Finlay et al., 2014).

From this case, there was no evidence that the patient's lung condition was caused by community pneumonia so that it could be concluded that this acute lung condition was a complication of severe malaria that occurred in the patient, this is contrary to the theory that mixed infection between P. vivax malaria and P. falciparum rarely gets severe clinical forms (Mohapatra et al., 2012).

Conclusion

Most cases of mixed-infected malaria are not found to be severe infections because P. vivax infection has a protective effect against the severe form of falciparum malaria. The management of mixed malaria infection uses a combined vivax and falciparum regimen with artesunate for severe malaria. This patient was treated with an artesunate injection and a combined vivax and falciparum therapeutic regimen, as signs of severe malaria were respiratory distress and muscle weakness. Mixed infection of vivax and falciparum malaria is a rare case with a small prevalence in Indonesia, and is generally not found in the form of severe malaria. Treatment with the right regimen and as early as possible is an important step to prevent the progression of severe malaria.

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