Images in Clinical Hematology

Malaria, the role of the blood smear – a case report

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A 28-year-old woman arriving from Africa came to the hospital presenting with fever, sweat and chills twice a day during the preceding week. The complete blood count showed a severe thrombocytopenia (47 × 10⁹/L (150–450 × 10⁹/L)). In the clinical chemistry tests the following alterations were found: ALT 124 U/L (0–33 U/L), AST 99 U/L (0–32 U/L), LDH 374 U/L (100–250 U/L), GGT 165 U/L (0–40 U/L) and CRP 2.66 mg/dL (<5 mg/dL). The leakage of parenchymal (transaminases) and membranous (GGT) enzymes into the circulation is due to the infection of liver cells by the sporozoite form of Plasmodium, which can cause hepatic congestion, sinusoidal blockage, and cellular inflammation. Transaminases increase with an increase in malaria parasite density. Thrombocytopenia emerges as a predictor of malaria.

The peripheral blood smear showed the presence of merozoites outside erythrocytes (Figure 1A); trophozoites (Figure 1B – band form); schizonts (Figure 1C – rosette pattern) and gametocytes (Figure 1D) of Plasmodium malariae.

In endemic countries, the precise and timely diagnosis of malaria plays a capital role in the timely treatment and overcoming of the risks of fatal outcomes. The peripheral blood smear is a simple technique that, within a few hours of blood collection, can show if Plasmodium is present and in most cases allows for the identification of the species involved. It also provides an estimate of parasite density. If the clinical suspicion is substantial and the parasite is undetectable in the first blood smear, it must be repeated every 12–24 h for a total of three sets. If all three sets are negative, this diagnosis may be ruled out.

The malaria parasite life cycle involves two hosts, an insect (e.g. female of the mosquito Anopheles) and a vertebrate (e.g. humans).

In humans, when the female insect (in which the sexual cycle occurs) takes a blood meal, gametocytes are ingested from the infected person. A human being (in whom the asexual cycle occurs) is infected when the infected female insect injects sporozoites into the host during a blood meal.

In humans, the major agents of malaria are Plasmodium falciparum, Plasmodium vivax, Plasmodium ovale and Plasmodium knowlesi. The parasite forms, trophozoites, merozoites and gametocytes, can be found in blood, and the schizonts can be found in the blood and liver.

Treatment with Atovaquone/Proguanil Hydrochloride (1000 mg/400 mg sid) for three days was effective, and the patient returned to her country already recovered from the disease.

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Conflicts of interest

The author declares no conflicts of interest.

REFERENCES


Figure 1 – “Peripheral blood smear (thin film) of the patient”. 