# Comment on: the relationship between splenomegaly and hematologic findings in patients with hepatosplenic schistosomiasis

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The aim of the authors of the paper 'Relationship between splenomegaly and hematologic findings in patients with hepatosplenic schistosomiasis' published in this edition of the *Revista Brasileira de Hematologia e Hemoterapia* was to evaluate hematological and hemostatic abnormalities in patients with the severe form of schistosomiasis and its possible association with splenomegaly and portal hypertension[1]. For this purpose a prospective study was performed of 55 compensated hepatosplenic schistosomiasis patients previously treated with praziquantel. All patients were outpatients of the Gastrointestinal Service of the *Hospital das Clínicas* of the *Universidade Federal de Pernambuco* (UFPE), Recife, Brazil, during the period 2010-2012. Thirty healthy individuals were selected as a control group. An abdominal ultrasound was performed in all patients and the Niamey protocols were used to measure the longitudinal diameter of the spleen and to classify the pattern of fibrosis. Moreover, routine liver tests were performed including albumin, aminotransferases (AST, ALT), alkaline phosphatase (ALP) and gamma glutamyl-transferase (γ-GT). A complete blood count and hemostatic tests such as prothrombin time/international normalization ratio (PT/INR), partial thromboplastin time (PTT), fibrinogen and D-dimer were carried out.

The authors observed that patients showed predominance of advanced pattern fibrosis. Furthermore, the routine liver and hemostatic tests had increased values compared to the control group with the exception of the level of fibrinogen. There were also high frequencies of upper gastrointestinal bleeding in patients (34%) and thrombocytopenia (83%); 36.5% had anemia and 47% presented leukopenia. An inverse correlation was found between the longitudinal diameter of the spleen and the platelet count.

The development of gastro-esophageal varices is a common complication of portal hypertension and bleeding from varices is a frequent cause of mortality and morbidity[2,3]. As the platelet count is a commonly available parameter and measurement of the spleen bipolar diameter has a high reproducibility in abdominal ultrasound studies[4,5], their use might be of help in the clinical management of patients with *Schistosoma mansoni* infection and suspected esophageal varices in endemic areas.

According to some authors[6,7], increases in the ALT and AST levels occur with liver cell damage, but in *S. mansoni* infections this type of injury is not commonly observed. On the other hand, the most important cause of increases in γ-GT is the chronic stimulation of the microsomal fraction of hepatocytes and the presence of cholestasis[8]. According to Martins & Borges, chronic stimulation of the microsomal fraction of hepatocytes occurs only in patients with the hepatosplenic form of schistosomiasis. Some authors[8,9] proposed that changes in the biliary tree, due to fibrosis of the portal space, may be the anatomical substrate for the increases in the ALP and γ-GT levels in patients with the hepatosplenic form of schistosomiasis.

In the literature, there is a tendency to explain hematologic changes related to portal hypertension as being due to hypersplenism just through observing hematological laboratory values[10,11]. It is noteworthy that pancytopenia in portal hypertension due to schistosomiasis is caused by intra-splenic blood stasis related to difficult venous drainage to the liver. Symmers fibrosis in hepatosplenic schistosomiasis does not interfere in the function of these organs. Therefore, there is doubt regarding the term hypersplenism which is perhaps confused with the term storage. In the case of splenomegaly schistosomiasis, cytopenia may be caused by the increase in splenic storage and not by a mononuclear phagocytic system disorder[11,12].

Apart from these considerations, there is the difficulty of explaining why the very low platelet and leukocyte counts found in patients with portal hypertension and schistosomiasis are not accompanied by clinical symptoms[11,13].

On the other hand, coagulation disorders are frequently observed in patients with schistosomiasis even though the pathophysiology for this has not yet been established. In patients with advanced hepatosplenic schistosomiasis, high levels of the pro-inflammatory cytokines, interleukin-1 alpha (IL-1α) and tumor necrosis factor alpha (TNF-α) and lipopolysaccharide (LPS) have been detected in the sera[14]. It is therefore assumed that a tissue factor procoagulant expressed by endothelial cells because of stimulation by these agents

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may participate in the activation of the extrinsic coagulation cascade[14]. Accordingly, it may be possible that host immune responses to schistosome eggs participate in not only granuloma formation and tissue fibrosis, but also in the development of hemostatic abnormalities in schistosomiasis mansoni[14].

## References


1. Leite LA, Domingues AL, Lopes EP, Ferreira RC, Pimenta Filho AA, Fonseca CS, et al. Relationship between splenomegaly and hematologic findings in patients with hepatosplenic schistosomiasis. Rev Bras Hematol Hemoter. Ahead of print.
2. Agha A, Abdulhadi MM, Marenco S, Bella A, Alsaudi D, El-Haddad A, et al. Use of the platelet count/spleen diameter ratio for the noninvasive diagnosis of esophageal varices in patients with schistosomiasis. Saudi J Gastroenterol. 2011;17(5):307-11.
3. De Franchis R, Dell'Era A, Primignani M. Diagnosis and monitoring of portal hypertension. Dig Liver Dis. 2008;40(5):312-7.
4. O'Donohue J, Ng C, Catnach S, Farrant P, Williams R. Diagnostic value of Doppler assessment of the hepatic and portal vessels and ultrasound of the spleen in liver disease. Eur J Gastroenterol Hepatol. 2004;16(2):147-55.
5. Winkfield B, Aubé C, Burtin P, Calès P. Inter-observer and intra-observer variability in hepatology. Eur J Gastroenterol Hepatol. 2003;15(9):959-66.
6. Kardorff R, Gabone RM, Mugashe C, Obiga D, Ramarokoto CE, Mahlert C, et al. *Schistosoma mansoni*-related morbidity on Ukerewe Island, Tanzania: clinical, ultrasonographical and biochemical parameters. Trop Med Int Health. 1997;2(3):230-9.
7. Aquino RT, Chieffi PP, Catunda SM, Araújo MF, Ribeiro MC, Taddeo EF, et al. Hepatitis B and C virus markers among patients with hepatosplenic mansoni schistosomiasis. Rev Inst Med Trop Sao Paulo. 2000;42(6):313-20.
8. Alves A Jr, Fontes DA, Melo VA de, Machado MC, Cruz JF, Santos EA. [Schistosomal portal hypertension: influence of the portal blood flow in serum levels of hepatic enzymes]. Arq Gastroenterol. 2003;40(4):203-8. Portuguese. Comment in: Arq Gastroenterol. 2003;40(4):201-2.
9. Martins RD, Borges DR. Ethanol challenge in non-alcoholic patients with schistosomiasis. J Clin Pathol. 1993;46(3):250-3.
10. Guerra CC, Haddad CM, Matsumoto M, Luzzi JR, da Silva MP, Chacon JP. [Hypersplenism behavior after selective splenorenal anastomosis]. AMB Rev Assoc Med Bras. 1985;31(3-4):65-70. Portuguese.
11. Petroianu A, Oliveira AE, Alberti LR. "Hiperesplenismo" em hipertensão porta por esquistossomose mansônica. Rev Bras Hematol Hemoter. 2004;26(3):195-201.
12. Petroianu A. Pesquisa em Medicina. In: Petroianu A. Ética, moral e deontologia médicas. Rio de Janeiro: Guanabara Koogan; 2000. p.174-8.
13. Petroianu A, Antunes LJ. Imune profiles in hepatosplenic schistosomiasis mansoni after surgical treatments. J Int Med Res. 1998;26(1):43-9.
14. Tanabe M. Haemostatic abnormalities in hepatosplenic schistosomiasis mansoni. Parasitol Int. 2003;52(4):351-9.


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