

Effect of Hyperbaric Oxygen Therapy on thrombosis in murine cerebral malaria

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Abstract

Cerebral malaria is a deadly form of malaria, marked by coagulopathy. Here, we investigated the effects of hyperbaric oxygen (HBO) on coagulation in experimental cerebral malaria (ECM). **Methods.** *Plasmodium berghei* ANKA (PbA)-infected mice were submitted to thrombus formation. Bleeding time and complete blood counts were performed. **Results.** HBO prolonged time length to complete arterial occlusion and shortened bleeding time. **Conclusion.** The altered coagulation status in ECM is at least in part reverted by HBO.

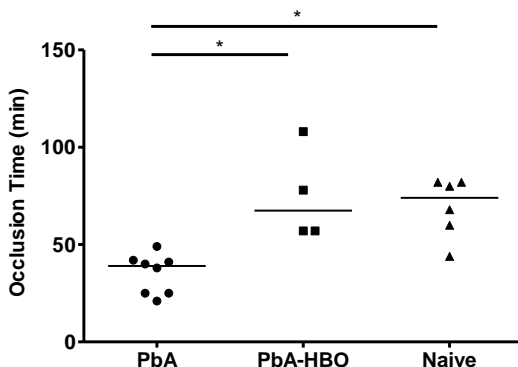
Key words: experimental cerebral malaria, thrombosis, hyperbaric oxygen.

Introduction

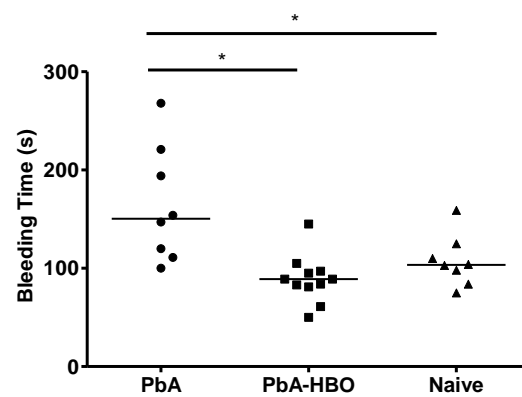
Cerebral malaria is a deadly form of malaria, marked by unbalanced cytokine production, altered brain microcirculation and coagulopathy. Recently, our group demonstrated that hyperbaric oxygen therapy (HBOT) protects mice against murine cerebral malaria (MCM) – C57BL/6 mice infected with *Plasmodium berghei* ANKA parasites. In this study, we investigated some effects of HBOT on coagulation in MCM, as malaria is supposedly associated with a procoagulant state.

Results and Discussion

Result 1: HBO prevents the carotid artery occlusion time decrease in PbA infected mice. Mice carotid was exposed and thrombus formation photochemically induced. The occlusion time was determined when blood flow fully stopped.



Result 2: HBOT prevents the bleeding time extension in PbA infected mice. A small incision was made in the left caudal vein of naive and PbA-infected mice, timing up until cessation of blood flow.



Results 3 and 4: A significant decrease in platelet count, accompanied by a significant increase in mean platelet volume was observed in PbA-infected mice regardless of HBO.

Conclusions

1. MCM is associated with changes in the coagulation status in PbA-infected mice.
2. These changes in coagulation are partially reverted by HBOT, as indicated by the maintenance of arterial occlusion and bleeding times.
3. The alterations in coagulation reverted by HBOT were not associated to platelet counts.
4. The increase in platelet volume may compensate for the low platelet counts. Such inverse relationship might explain why spontaneous bleeding was not observed in both cerebral malaria groups.

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